Appendix A

COLUMBIA RIVER CROSSING RECORD OF DECISION

INTERSTATE 5 COLUMBIA RIVER CROSSING PROJECT

Record of Decision

FHWA-WA-EIS-08-01-F

December 2011



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INTERSTATE 5 COLUMBIA RIVER CROSSING PROJECT

Record of Decision

FHWA-WA-EIS-08-01-F

Decision

The Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA), pursuant to 23 CFR Part 771.127, find that the requirements of the National Environmental Policy Act (NEPA) have been satisfied for the construction and operation of the Selected Alternative of the Interstate 5 (I-5) Columbia River Crossing (CRC) Project (Project). This Record of Decision (ROD) also provides findings on other environmentally-related federal statutory requirements.

This ROD is based on FHWA's and FTA's close monitoring and independent evaluations of the process followed by the Columbia River Crossing Project and its project sponsors in setting forth and considering the effects of the Project and the available alternatives. This process included the preparation of the Draft Environmental Impact Statement (DEIS) (May 2008), the 17th Street Technical Memorandum (March 2010), Composite Deck Truss Bridge Type NEPA Re-evaluation (March 2011), Steel Bridge Documented Categorical Exclusion (November 2010), Environmental NEPA Re-evaluation (May 2011), and the Columbia River Crossing Final Environmental Impact Statement (FEIS) (September 2011) (the DEIS and FEIS are sometimes collectively referred to as "EIS") and the Final Section 4(f) Evaluation (September 2011) (all collectively referred to as the "Environmental Review Documents"), and the determinations and evaluations made therein.

This ROD describes the basis for the decision and the alternatives considered, identifies the environmentally preferred alternative, and documents the mitigation measures that will be implemented. The public's comments on the FEIS and responses thereto are also included in the document and accompanying appendices. The summary descriptions included herein do not supersede or negate any of the information, descriptions, or evaluations provided in the Environmental Review Documents, except as may be expressly noted below. This ROD and the associated published Environmental Review Documents, incorporated herein by reference, constitute the FHWA and FTA environmental record for the project.

The Project is the Selected Alternative (SA), identified in the FEIS as the Locally Preferred Alternative (LPA), which, in summary, provides transportation improvements throughout the 5-mile project corridor, including:

- A new river crossing over the Columbia River and I-5 highway improvements including improvements to seven interchanges, north and south of the river, as well as related enhancements to the local street network. Add new structures and improve the existing I-5 mainline bridge over North Portland Harbor.

- A variety of bicycle and pedestrian improvements throughout the project corridor.
- Extension of light rail from the Expo Center in Portland to Clark College in Vancouver, along with associated transit improvements, including transit stations, park and rides, bus route changes, and expansion of a light rail transit maintenance facility.
- Transportation demand and system management measures to be implemented with the project, including the use of tolls.

This I-5 Columbia River Crossing Project Record of Decision is hereby approved.

Daniel M. Mathis	Phillip Ditzler	R.F. Krochalis
FHWA Washington Division Administrator	FHWA Oregon Division Administrator	FTA Regional Administrator, Region 10
12/07/2011	12/07/2011	12/07/11
Date of Approval	Date of Approval	Date of Approval

TABLE OF CONTENTS

RECORD OF DECISION **1**
Introduction **1**
Selected Alternative **1**
Purpose and Need **3**
Development of the Alternatives Considered in the EIS **5**
Basis for Decision **9**
Potential Construction Phasing **21**
Project Mitigation Commitments **21**
Mitigation Monitoring and Enforcement **25**
Determinations and Findings **25**
Public Opportunity to Comment **43**
Comments Received on the Final EIS and Responses **44**
Agency and Tribal Coordination **57**

ATTACHMENTS
Appendix A: Project Mitigation Commitments
Appendix B: Maps of Selected Alternative
Appendix C: Anticipated Local, State and Federal Permits and Approvals
Appendix D: FEIS Errata
Appendix E:* Public Comments Received during FEIS Review Period and CRC Responses
Appendix F:* Biological Opinion
Appendix G:* Section 106 Memorandum of Agreement
*electronic appendices

ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
BIA	Bridge Influence Area
BMP	Best Management Practice
CEJG	Community and Environmental Justice Group
CMP	Congestion Management Program
CPTED	Crime Prevention Through Environmental Design
CRC	Columbia River Crossing
DEIS	Draft Environmental Impact Statement
DOT	Department of Transportation
EJ	Environmental Justice
EMS	Emergency Management System
ESA	Environmental Site Assessment
FAA	Federal Aviation Administration
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FWG	Freight Working Group
GHG	Greenhouse Gas
GMA	Growth Management Act
HiNooN	Hayden Island Neighborhood Network
IAMP	Interchange Area Management Plan
LEED	Leadership in Energy and Environmental Design
LPA	Locally Preferred Alternative
LRT	Light Rail Transit
MDSG	Marine Drive Stakeholders Group
MOVES	Motor Vehicle Emission Simulator
MPO	Metropolitan Planning Organization
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
ODOT	Oregon Department of Transportation

OIPP	Oregon Innovative Partnerships Program
PBAC	Pedestrian Bicycle Advisory Committee
PMAG	Performance Measures Advisory Group
PSC	Project Sponsors Council
PWG	Portland Working Group
RCW	Revised Code of Washington
ROD	Record of Decision
RTC	Southwest Washington Regional Transportation Council
RTP	Regional Transportation Plan
SA	Selected Alternative
SOV	Single-Occupancy Vehicle
TDM	Transportation Demand Management
TMA	Transportation Management Assessment
TOD	Transit-Oriented Development
TSM	Transportation System Management
TSMO	Transportation System Management and Operational
UDAG	Urban Design Advisory Group
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
VMS	variable message sign
VMT	vehicle miles traveled
VWG	Vancouver Working Group
WSDOT	Washington State Department of Transportation

Record of Decision

Introduction

The Columbia River Crossing (CRC) project ("CRC project" or "Project") is a bridge, transit, highway, and bicycle and pedestrian improvement project led by the project sponsors: Oregon and Washington Departments of Transportation (ODOT, WSDOT), Southwest Washington Regional Transportation Council (RTC), Metro, Clark County Public Transportation Benefit Area (C-TRAN), and Tri-County Metropolitan Transportation District (TriMet), (collectively, hereinafter also referred to as "Project Sponsors") on behalf of the Federal Highway Administration (FHWA), and the Federal Transit Administration (FTA) to improve safety and mobility in the Interstate-5 (I-5) corridor between Portland, Oregon and Vancouver, Washington. FHWA and FTA are the lead federal agencies for preparing the required documentation under the compliance with the National Environmental Policy Act (NEPA). I-5is the main interstate corridor on the west coast from Canada to Mexico and one of only two roadway crossings of the Columbia River in the Portland-Vancouver metropolitan area. The Project focuses on a 5-mile segment of the I-5 corridor extending from State Route (SR) 500 in Vancouver to approximately Columbia Boulevard in Portland (project area). The Project seeks to address six problems (as described further in the Purpose and Need statement): growing travel demand and congestion; impaired freight movement; limited public transportation operation, connectivity, and reliability; safety and vulnerability to incidents; substandard bicycle and pedestrian facilities; and seismic vulnerability. Alternatives considered in the Draft Environmental Impact Statement (DEIS) included a No-Build Alternative and four multimodal build alternatives. The alternatives either replaced or rehabilitated the existing bridge structures over the river, provided highway improvements, either extended light rail or provided bus rapid transit with several transit alignment and length options, improved bicycle and pedestrian facilities, considered tolling, and implemented transportation demand and system management measures.

During preparation and following publication of the DEIS, the Project solicited public and stakeholder feedback through public comments, hearings and workshops to gather input and discuss the Purpose and Need, screening criteria and process, range of alternatives for the DEIS and ultimately the Selected Alternative (SA). (The term SA, used herein, also refers to the term "Locally Preferred Alternative (LPA)" used in the Environmental Review Documents as they are one and the same.) In July 2008, following the release of the DEIS, the project sponsors adopted the LPA as a refined version of Alternative 3 in the DEIS. The LPA is defined in the Final Environmental Impact Statement (FEIS) and summarized in this ROD.

Selected Alternative

FTA and FHWA approve the alternative referred to as the LPA in the FEIS as the Selected Alternative. The SA includes a variety of transportation improvements throughout the 5-mile project corridor, including:

- A new river crossing over the Columbia River and I-5 highway improvements. Improvements to seven interchanges, from south to north: Victory Boulevard, Marine Drive,

Hayden Island, SR-14, Mill Plain, Fourth Plain and SR 500. Related enhancements to the local street network.

- Improvements to the existing I-5 mainline bridge over North Portland Harbor; three new structures over this waterway associated with I-5; and one new multi-modal bridge carrying light rail transit, local traffic, pedestrians and bicyclists.
- A variety of bicycle and pedestrian improvements throughout the project corridor. A multi-use path connecting to the existing system. The path would allow users to travel from north Portland, over Hayden Island and the Columbia River into downtown Vancouver.
- Extension of light rail transit from the Expo Center in Portland to Clark College in Vancouver and associated transit improvements. Transit stations would be built on Hayden Island, in downtown Vancouver, and a terminus near Clark College. Three park and rides are to be built, Columbia (near the SR 14 interchange), Mill (in uptown Vancouver) and Clark (near Clark College). Improvements would be made to the tracks on the Steel Bridge. Also, bus route changes and the expansion of the Ruby Junction light rail transit maintenance facility.
- Transportation demand and system management measures to be implemented with the project, including the use of tolls, subject to the authority of the Washington and Oregon Transportation Commissions.

See Appendix B for an illustration of the SA. A detailed description of the SA is included in Chapter 2 of the FEIS.

Environmentally Preferable Alternative

40 CFR Section 1505.2(b) of the Council of Environmental Quality's regulations that implement NEPA require that the ROD shall "identify all alternatives considered by the agency in reaching its decision, specifying the alternative or alternatives which were considered to be environmentally preferable." The environmentally preferable alternative is generally the alternative that has the least impact to the environment, as described in the EIS.

The Environmental Review Documents evaluate the environmental effects of the SA and the other build alternatives. The analysis finds that, among the build alternatives, the SA provides the greatest benefit to traffic safety, bicycle and pedestrian access and mobility, land use and development. The SA has the fewest impacts to Section 4(f) resources, fish, wetlands, geology and soils, and traffic noise. Other build alternatives have fewer displacements and fewer transit noise impacts. However, all transit noise impacts can be mitigated by the measures described in this document. The SA would have similar impacts as the other build alternatives in the other environmental metrics analyzed in the FEIS.

Compared to the other build alternatives, the SA has the most environmental categories in which it is the least impactful alternative. FTA and FHWA find that the SA is the alternative with the least adverse environmental effects and the most feasible and prudent alternative in meeting the project Purpose and Need. Therefore, FHWA and FTA consider the SA to be the environmentally preferred alternative and it is the selected alternative because it best addresses the Purpose and Need of the Project.

Background

Major transportation improvements in the project area have been studied for over a decade. In 2001, the Washington and Oregon governors appointed a bi-state task force, called the I-5 Trade and Transportation Task Force, to address concerns about congestion on I-5 between Portland and Vancouver. The task force adopted a final strategic plan on June 18th, 2002. The plan made recommendations for transportation improvements between the Interstate 405 (I-405) interchange in Portland and the Interstate 205 (I-205) interchange north of Vancouver. The recommendations included:

- Expand I-5 to include three through lanes in each direction, including the area through Delta Park.
- Introduce a phased light rail loop in Clark County in the vicinity of the I-5, SR 500/Fourth Plain, and I-205 corridors.
- Provide an additional bridge or a replacement crossing for the I-5 crossing of the Columbia River, with up to two additional lanes in each direction for merging traffic and two light rail tracks.
- Improve interchanges and add merging lanes between SR 500 in Vancouver and Columbia Boulevard in Portland, including a full interchange at Columbia Boulevard.
- Improve capacity for freight rail
- Encourage bi-state coordination of land use and transportation issues to reduce highway demand and protect corridor investments.
- Involve communities along the corridor to ensure that the final project outcomes are equitable.

The Project was developed to further study, develop and implement solutions to several of these recommendations.

In 1993, local agencies began studying high-capacity transit in the “South/North Corridor,” which extended from Clackamas and Milwaukie, Oregon, to Vancouver, Washington. FTA and Metro published the South/North Corridor Project DEIS in 1998, This identified a variety of alignment and length options for a light rail corridor connecting Milwaukie, downtown Portland, north Portland, and downtown Vancouver. One of the options that has since been constructed is the TriMet Yellow Line, or Interstate MAX. The Yellow Line extends from the Rose Quarter near downtown Portland to the Expo Center in North Portland.

Purpose and Need

As described in the DEIS and FEIS, the Purpose and Need statement is provided below.

Project Purpose

The purpose of the proposed action is to improve I-5 corridor mobility by addressing present and future travel demand and mobility needs in the CRC Bridge Influence Area (BIA). The BIA extends from approximately Columbia Boulevard in the south to SR 500 in the north. Relative to the No-Build Alternative, the proposed action is intended to achieve the following objectives: a) improve travel safety and traffic operations on the I-5 crossing’s bridges and associated

interchanges; b) improve connectivity, reliability, travel times, and operations of public transportation modal alternatives in the BIA; c) improve highway freight mobility and address interstate travel and commerce needs in the BIA; and d) improve the I-5 river crossing's structural integrity (seismic stability).

Project Need

The specific needs to be addressed by the proposed action include:

- **Growing travel demand and congestion:** Existing travel demand exceeds capacity in the I-5 Columbia River crossing and associated interchanges. This corridor experiences heavy congestion and delay lasting 4 to 6 hours daily during the morning and afternoon peak travel periods and when traffic accidents, vehicle breakdowns, or bridge lifts occur. Due to excess travel demand and congestion in the I-5 bridge corridor, many trips take the longer, alternative I-205 route across the river. Spillover traffic from I-5 onto parallel arterials such as Martin Luther King Jr. Boulevard and Interstate Avenue increases local congestion. In 2005, the I-5 and I-205 crossings carried 280,000 vehicle trips across the Columbia River daily. Daily traffic demand over the I-5 crossing is projected to increase by more than 35 percent during the next 20 years, with stop-and-go conditions increasing to approximately 15 hours daily if no improvements are made.
- **Impaired freight movement:** I-5 is part of the National Truck Network, and the most important freight highway on the West Coast, linking international, national and regional markets in Canada, Mexico and the Pacific Rim with destinations throughout the western United States. In the center of the project area, I-5 intersects with the Columbia River's deep water shipping and barging as well as two river-level, transcontinental rail lines. The I-5 crossing provides direct and important highway connections to the Port of Vancouver and Port of Portland facilities located on the Columbia River as well as the majority of the area's freight consolidation facilities and distribution terminals. Freight volumes moved by truck to and from the area are projected to more than double over the next 25 years. Vehicle-hours of delay on truck routes in the Portland-Vancouver area are projected to increase by more than 90 percent over the next 20 years. Growing demand and congestion will result in increasing delay, costs and uncertainty for all businesses that rely on this corridor for freight movement.
- **Limited public transportation operation, connectivity, and reliability:** Due to limited public transportation options, a number of transportation markets are not well served. The key transit markets include trips between the Portland Central City and the city of Vancouver and Clark County, trips between north/northeast Portland and the city of Vancouver and Clark County, and trips connecting the city of Vancouver and Clark County with the regional transit system in Oregon. Current congestion in the corridor adversely impacts public transportation service reliability and travel speed. Southbound bus travel times across the bridge are currently up to three times longer during parts of the a.m. peak compared to off-peak. Travel times for public transit using general purpose lanes on I-5 in the BIA are expected to increase substantially by 2030.
- **Safety and vulnerability to incidents:** The I-5 river crossing and its approach sections experience crash rates more than 2 times higher than statewide averages for comparable facilities. Incident evaluations generally attribute these crashes to traffic congestion and weaving movements associated with closely spaced interchanges and short merge distances.

Without breakdown lanes or shoulders, even minor traffic accidents or stalls cause severe delay or more serious accidents.

- **Substandard bicycle and pedestrian facilities:** The bike/pedestrian lanes on the I-5 Columbia River bridges are about 3.5 to 4 feet wide, narrower than the 10-foot standard, and are located extremely close to traffic lanes, thus impacting safety for pedestrians and bicyclists. Direct pedestrian and bicycle connectivity are poor in the BIA.
- **Seismic vulnerability:** The existing I-5 bridges are located in a seismically active zone. They do not meet current seismic standards and are vulnerable to failure in an earthquake.

Development of the Alternatives Considered in the EIS

As part of development of the EIS, the project sponsors evaluated a wide range of potential solutions for addressing the identified problems in the CRC corridor. Elements of the Project have been proposed and studied since the early 1990s. In 2002, the I-5 Transportation and Trade Partnership produced an evaluation of multiple highway, transit, and river crossing improvements in this corridor and other parts of I-5. This process gathered public and stakeholder input on issues and potential solutions for transportation problems in the I-5 corridor. Starting in October 2005, and consistent with Section 6002 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), the Project began working closely with the public, stakeholders, and local jurisdictions to develop the Project's Purpose and Need.

Following the adoption of the Project Purpose and Need, the Project developed an Evaluation Framework that is based on the Purpose and Need and set forth the criteria by which project components would be evaluated and screened for further consideration. The Project began soliciting ideas and identifying possible transportation components (for example, various transit technologies and river crossing types and locations) and over 70 such components were identified. With public and agency input, the Project performed two rounds of evaluation and screening, as well as conducted additional evaluation and research, to narrow these options and assemble these components into the 12 alternative packages. The Project then analyzed how well each alternative would address the criteria from the Evaluation Framework. In January 2007, the Project launched an intensive public involvement effort to present the results of this evaluation and invite comments on which alternatives should move forward into the DEIS.

Following the public process to develop and screen potential solutions, the DEIS stated the Project's Purpose and Need statement and included the detailed assessment of the reasonable range of alternatives most likely to meet the Project's Purpose and Need. All build alternatives assessed in the DEIS included transit, highway, bicycle, and pedestrian improvements. Some of these were physical improvements, such as adding highway capacity or building transit facilities. Others were operational improvements to help the system function more efficiently.

Four build alternatives were analyzed in detail in the DEIS, in addition to a No-Build Alternative. The SA is a refined version of Alternative 3. Each alternative was composed of several components that, when combined, created a particular multimodal alternative to address the problems this project seeks to fix. All build alternatives include the following components:

- Multimodal river crossing and highway improvements
    - Bridges over the Columbia River carrying transit, highway, bicycle, and pedestrian traffic

  - Bicycle and pedestrian improvements between north Portland and downtown Vancouver
  - Highway and interchange improvements from Marine Drive in north Portland to SR 500 in Vancouver
- High-capacity transit
- Transit terminus and alignment options
  - Transit terminus (endpoint) options
  - Transit alignment options
- Transit park and ride locations
- Transit operations options (frequency of train or bus rapid transit service)
- Bridge tolls
- Transportation system management (TSM) and transportation demand management (TDM) measures

Between the publication of the DEIS and the publication of the FEIS, a locally preferred alternative was selected. The FEIS includes analysis of the locally preferred alternative, a no-build option, and the four build options analyzed in the DEIS (as described in the tables below). The FEIS includes refinements in design, impacts and mitigation measures compared to the DEIS. To facilitate development of mitigation measures and compliance with other environmental laws, the project developed the LPA in the FEIS to a higher level of detail than the other alternatives.

Exhibit A summarizes the components included in each alternative. Exhibit B identifies the key features of each alternative. Appendix B illustrates the SA and the build alternatives evaluated in the EIS.

Exhibit A

Comparison of EIS Alternatives

Components	Alternative 1 (No Build)	SA (refined Alternative 3)	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Multimodal River Crossing and Highway	Existing	**Replacement**	Replacement	Replacement	Supplemental	Supplemental
Transit Mode	None	**Light Rail**	Bus Rapid Transit	Light Rail	Bus Rapid Transit	Light Rail
Transit Terminus	N/A	**Clark College**	Kiggins Bowl, Lincoln, Clark College MOS, or Mill Plain MOS	Kiggins Bowl, Lincoln, Clark College MOS, or Mill Plain MOS	Kiggins Bowl, Lincoln, Clark College MOS, or Mill Plain MOS	Kiggins Bowl, Lincoln, Clark College MOS, or Mill Plain MOS
TDM/TSM Measures	Current Programs	**Similar to DEIS**	Expanded TDM/TSM programs			
I-5 Bridge Toll	None	**Standard rate**	Standard rate	Standard rate	Higher rate	Higher rate
Transit Operations	Existing	**Efficient (refined)**	Efficient	Efficient	Increased	Increased

Exhibit B

Key Transit and Highway Features of the EIS Alternatives

Alternative	Transit Features	Highway Features
No-Build Alternative	• Increases to C-TRAN service hours for bus routes throughout Vancouver and Clark County to keep pace with anticipated changes in congestion. • Increases to TriMet's services hours for bus routes throughout north and northeast Portland to keep pace with anticipated changes in congestion. • Completion of the first phase of the South Corridor light rail project on the Portland Transit Mall and I-205.	• I-5 widening and improvements around Delta Park.
Locally Preferred Alternative (Refinement of Alternative 3)	• Extension of the light rail guideway from the Expo Center over Hayden Island and across the Columbia River to a terminus at Clark College in Vancouver. The light rail guideway would extend 2.9 miles north from the Expo Center, and would include seven transit stations and three structured park and rides with 2,900 spaces. • Expansion of TriMet's Ruby Junction light rail maintenance facility in Gresham. • 19 light rail vehicles (LRVs) would be included in this alternative. • Changes to C-TRAN local bus routes to connect with the new light rail stations and park and rides.	• A new replacement crossing over the Columbia River, with a "stacked transit/highway bridge" design that would include transit beneath the western highway bridge deck and a bicycle and pedestrian path beneath the eastern highway deck. Each bridge would have 5 traffic lanes and full design shoulders. • Improvements to the following I-5 interchanges: Victory Boulevard, Marine Drive, Hayden Island, SR 14, Mill Plain, Fourth Plain, and SR 500. With highway phasing, certain portions of the improvements at the Victory Boulevard, Marine Drive, and SR 500 interchanges would be deferred. • Auxiliary lanes for traffic entering and/or exiting I-5 between Victory Boulevard and SR 500. • A toll would be charged on the I-5 crossing, with higher rates during peak travel periods.
Replacement crossing with bus rapid transit	• Changes to C-TRAN local bus routes to connect with the new BRT stations and park and rides. • Expansion of TriMet's Ruby Junction light rail maintenance facility in Gresham. • Changes to C-TRAN local bus routes to connect with the new bus guideway and park and rides. • 27 bus rapid transit vehicles (60' articulated buses) and 12 standard buses would be included in this alternative.	• A new replacement crossing over the Columbia River, with either three separate bridges (two for interstate traffic and a third for buses, bicycles, and pedestrians) or a "stacked highway/transit bridge" design that would include transit beneath the western highway bridge deck and a bicycle and pedestrian path beneath the eastern highway deck. • Improvements to the following I-5 interchanges: Marine Drive, Hayden Island, SR 14, Mill Plain, Fourth Plain, and SR 500. • Additional auxiliary lanes for traffic entering and/or exiting I-5 between Marine Drive and SR 500. • A toll would be charged on the I-5 crossing, with higher rates during peak travel periods.
Replacement crossing with light rail	• Extension of the light rail guideway from the Expo Center over Hayden Island and across the Columbia River to a terminus in Vancouver. Depending on transit terminus, the light rail guideway would extend between 2.07 and 4.22 miles north from the Expo Center, and would include five to seven transit stations and three to five structured or surface park and rides with up to 2,410 spaces. • Changes to C-TRAN local bus routes to connect with the new light rail stations and park and rides. • Expansion of TriMet's Ruby Junction light rail maintenance facility in Gresham. • 14 LRVs and 27 standard buses would be included in this alternative.	• Same highway features as Alternative 2. • This alternative was also modeled without a toll to determine the potential effects of tolling on traffic patterns.

Supplemental crossing with bus rapid transit	• Same transit features as Alternative 2, but higher frequency operations of bus rapid transit and local bus routes. • This alternative would include 38 bus rapid transit vehicles and 143 standard buses.	• A new, supplemental crossing for southbound interstate traffic and exclusive lanes for buses. • Both existing I-5 bridges would be re-striped for two lanes each to carry northbound I-5 traffic. • Seismic retrofits to the existing bridges. • Improvements to the following I-5 interchanges: Marine Drive, Hayden Island, SR 14, Mill Plain, Fourth Plain, and SR 500. • Additional auxiliary lanes (generally one less additional lane than Alternatives 2 and 3) for traffic entering and/or exiting I-5 between Marine Drive and SR 500. • A toll would be charged on the I-5 crossing, with higher rates during peak travel periods. During these peak travel periods, the toll would be higher than with Alternatives 2 or 3.
Supplemental crossing with light rail	• Same transit features as Alternative 3, but higher frequency operations for light rail and for local bus routes. • This alternative would include 18 LRVs and 147 standard buses.	• Same highway features as Alternative 4.

Alternatives Considered but Rejected

A wide range of transportation alternatives and improvements were considered during screening and subsequent evaluation. Exhibit C summarizes the alternatives, options and components that were considered but rejected.

Exhibit C

Alternatives Considered but Rejected

Transit	River Crossing
Express Bus in general purpose lanes	Replacement Bridge-Downstream/Low-level/Movable
Express Bus in managed lanes	Replacement Bridge-Upstream/Low-level/Movable
Bus Rapid Transit (BRT) – Lite[a]	Replacement Bridge-Upstream/Mid-level
Bus Rapid Transit (BRT) – Full[b]	Replacement Bridge-Downstream/High-level
Streetcar	Replacement Bridge-Upstream/High-level
High Speed Rail	Supplemental Bridge-Downstream/Low-level/Movable
Ferry Service	Supplemental Bridge-Upstream/Low-level/Movable
Monorail System	Supplemental Bridge-Downstream/Mid-level
Magnetic Levitation Railway	Supplemental Bridge-Upstream/Mid-level
Commuter Rail	Supplemental Bridge-Downstream/High-level
Heavy Rail	Supplemental Bridge-Upstream/High-level
Personal Rapid Transit	Tunnel to supplement I-5
People Mover/Automated Guideway Transit	New Corridor Crossing
	New Corridor Crossing plus widen existing I-5 Bridges
	New Western Highway (I-605)
	New Eastern Columbia River Crossing
	I-205 Improvements
	Arterial Crossing to supplement I-5

Transit	River Crossing
	Replacement Tunnel
	33rd Avenue Crossing
	Non-Freeway Multimodal Columbia River Crossing
	Arterial Crossing with I-5 Improvements

a Bus rapid transit-lite is an all-day bus rapid transit service that operates in exclusive, managed or general purpose lanes, which may or may not have in-line stations and special vehicles.

b Bus rapid transit-full is an all-day bus rapid transit service with an exclusive right-of-way, in-line stations, special vehicles, and a unique branded identity.

Other Components Considered but Rejected

Exhibit D

Other Components Considered but Rejected

Transit	River Crossing/Highway
Increased Transit Operations	Three-bridge Design over the Columbia, Replacement
Kiggins Bowl Terminus	12 Lanes on River Crossing
Lincoln Terminus	8 Lanes on River Crossing
Mill Plain MOS	Marine Drive Southern Realignment
16th Street Alignment	Marine Drive Diagonal Realignment
McLoughlin Boulevard Alignment	Replacing North Portland Harbor Bridge
Two-way on Broadway Street	SR 14 to I-5 Northbound Second Collector-Distributor Lane
Two-way on Washington Street	SR 14 Left Loop Interchange design
Washington Street/Main Street Couplet	
Washington Street/Columbia Street Couplet	
Offset Hayden Island Alignment	
Ross Park and Ride	
Kiggins Bowl Park and Ride	
SR 14 Park and Ride	
Mill Plain Park and Ride Bounded by Broadway, Main, 16th and 17th	
Surface Park and Ride Lots	
39th and Main Park and Ride	

Basis for Decision

The following summarizes the basis for selection of the LPA as the SA in this ROD over other alternative designs and mode choices. This section describes how the SA best meets the Purpose and Need of the Project.

Key Findings Regarding how the Selected Alternative Best meets the Purpose and Need

Below is a list of each “need” from the Project Purpose and Need statement with a description of how the SA (a replacement river crossing with two bridges and light rail transit (LRT) to Clark College) best meets each “need” compared to all other alternatives evaluated.

Growing Travel Demand and Congestion

A replacement river crossing would provide more congestion relief than the supplemental river crossing or No-Build Alternative. The No-Build Alternative would accommodate about 56,000 people (person trips) during the southbound morning and northbound evening peak periods, and under this alternative, congestion is predicted to increase to 15 hours a day by the year 2030. The replacement crossing would accommodate the more than 78,000 people predicted to cross the bridge during peak commute periods and congestion would last for approximately 5 hours each day in 2030. The supplemental crossing would accommodate approximately 66,000 people to cross the river during peak periods, but 11 hours of congestion would remain each day.

Local streets would experience more traffic with a supplemental crossing than with a replacement crossing, especially in lower downtown Vancouver and near the Marine Drive interchange, as described in the FEIS and DEIS. The intersection at 6th and Washington in downtown Vancouver would have to be closed with the supplemental crossing, which would cause increased traffic congestion on lower downtown streets. The replacement crossing would not require this closure. It would also allow the City of Vancouver to realize its planned extension of Main Street to the waterfront, reducing congestion in lower downtown Vancouver and increasing connectivity to the waterfront. The supplemental crossing would preclude the City from extending Main Street.

The supplemental crossing would split northbound traffic between the two existing bridges. By splitting northbound traffic on two separate structures, northbound motorists exiting at Hayden Island, SR 14, downtown Vancouver, Mill Plain, or Fourth Plain would have to get into the right two lanes around the Marine Drive area, which would cause last-second weaving, a major safety issue. Additionally, northbound motorists accessing I-5 from Marine Drive or Hayden Island toward destinations north of Fourth Plain would enter these right two lanes and then either weave quickly left to access the through lanes on the western bridge or cross on the eastern bridge, which is expected to be more congested with traffic exiting the freeway at the various Vancouver interchanges. The multiple weaving, merging, and diverging sections along this two-lane segment of I-5 would result in substantial congestion, and cause traffic to back up on on-ramps and local streets around Marine Drive and on Hayden Island. In contrast, the replacement crossing would not require splitting northbound I-5 traffic onto two structures and would avoid these problems.

Across the North Portland Harbor, the mainline I-5 traffic would use the existing North Portland Harbor Bridge. Three new structures over the harbor would carry ramp traffic and a new local multimodal bridge would carry transit, cars, bicyclists and pedestrians; providing access between Hayden Island and the Oregon mainland separate from I-5 traffic.

Impaired Freight Movement

Truck Freight

I-5 in the Project area provides connections to two major ports, deep-water shipping, up-river barging, two transcontinental rail lines, and a major international airport. It also provides critical infrastructure to support the movement of truck-hauled freight that is vital to the economy of the Portland-Vancouver region as well as to the Oregon and Washington state economies. As discussed above, the replacement river crossing would improve freight reliability compared to the No-Build and supplemental alternatives by providing fewer hours of congestion throughout

the day. The replacement bridge also improves conditions reliability by eliminating the bridge lifts that would continue to occur with the supplemental and No-Build alternatives.

The replacement river crossing greatly improves freight movement compared to the supplemental river crossing and No-Build. The I-5 corridor is the backbone of a network of roads that provide access to the greater Vancouver and Portland region. Trade capacity studies conclude that while all modes are important, the roadway system links all of the other modes and links land uses critical to business.

Five industries in the Portland-Vancouver region are particularly sensitive to road congestion: lumber/wood/paper, distribution/wholesale trade, transportation equipment/steel, farm and food products and high-tech. These industries accounted for approximately 70 percent of the commodity tonnage that crossed the I-5 and I-205 bridges and for 31 percent of Oregon and Washington's gross regional output in 2000. These industries would benefit greatly by the congestion relief improvements offered by the SA.

Marine Freight Navigation Safety

Marine vessels traveling this section of the Columbia River must navigate under one of the fixed spans or through the lift span of the I-5 bridges, and must also navigate through the swing span of the Burlington Northern Santa Fe (BNSF) railroad bridge one mile downstream. Navigation safety for these vessels, especially when traveling downstream (with the current), would be substantially improved with a replacement river crossing but worsened by a supplemental river crossing. Currently, vessels making this trip must make a difficult S-curve maneuver to navigate between the high span of the existing bridges and the swing-span of the BNSF rail bridge, because these channels are not in alignment—the existing I-5 crossing high span is roughly in the center of the river, but the BNSF swing span is closer to the north bank. When the river runs high, this maneuver is especially difficult, frequently forcing vessels to wait to use the I-5 lift span that is closer to the north bank and better aligned with the swing span of the BNSF railroad bridge.

A supplemental crossing would make the current navigational situation worse by adding more piers between the existing I-5 crossing and the BNSF railroad bridge. A supplemental crossing would also narrow the high-span and lift-span channels by 40 to 60 feet, because the existing bridge piers would need to be widened to improve seismic safety. These changes would increase the navigational difficulty and hazards of the river.

A replacement crossing would improve navigation safety and efficiency. The new crossing would require fewer piers, creating less of an obstacle to river navigation than either the No-Build Alternative or a supplemental crossing. Taller vessels would not be restricted by the hours of lift span operation. In addition, the new primary channel under the I-5 crossing would have a better alignment with the channel through the BNSF railroad bridge, and this would improve navigation even though the two crossings would be slightly closer together. With the SA, the available clearance of the primary channel would be a minimum of 95 feet above 0 on the Columbia River Datum, over a 300-foot width.

Limited Public Transportation Operation, Connectivity and Reliability

Light rail would provide quicker and more direct access to key destinations and provide greater capacity, which would help attract more daily and peak period transit riders than bus rapid transit. Bus rapid transit would cost less to construct, but would cost more to operate each year. Although light rail would be more expensive to build initially, it would attract more riders and would have lower operating costs over the project lifetime. Additionally, research suggests that light rail is likely to attract more investment around transit stations, which would better allow the cities of Vancouver and Portland to attain locally and regionally adopted land use goals for managing growth and promoting compact, transit-oriented development.

Travel Times and Reliability

Light rail would provide better travel times and reliability than bus rapid transit. Bus rapid transit buses would travel in exclusive lanes in the project area but would be mixed with general traffic outside the project area, and therefore would be subject to congestion-induced delays. Such delays would increase travel times and reduce reliability. Light rail would also travel faster than bus rapid transit within the project area (averaging 17 mph versus 14.5 mph, including stops) because it would have signal priority, shorter wait times at stations, and quicker acceleration.

Transit Ridership

Either transit mode would at least double transit ridership across the Columbia River compared to the No-Build Alternative. Light rail would attract more riders than bus rapid transit. According to FEIS analysis, the SA would carry 6,100 people over the I-5 crossing northbound during the peak period, while the alternatives with bus rapid transit would only carry 5,150 to 5,350 people. Integration with the existing MAX system would allow transit users to travel between Vancouver and Portland without a transfer. Transfers add travel time, unreliability, and inconvenience to potential transit users' trips.

Safety and Vulnerability to Incidents

The SA would improve non-standard geometric and safety design features on the I-5 mainline and ramps within the project area. Improvements would be made to the existing short on-ramp merges/acceleration lanes and off-ramp diverges/deceleration distances, short weaving areas, substandard lane widths, vertical and horizontal curves that limit sight distance, and narrow or non-existent shoulders.

As the number of vehicular collisions in the main project area is related to the presence of non-standard geometric design and safety features, which is exacerbated when traffic levels are at or near congested conditions, the SA would substantially improve traffic safety in this area. Analysis in the FEIS estimated that the project would reduce average annual yearly collisions in the main project area from 750 under the No-Build to between 210 and 240 in the SA.

As stated above, the existing traffic safety hazards on I-5 in the project area include lack of shoulders, narrow lanes, poor sight distances, short ramps, short merge lanes, and bridge lifts. These hazards would be corrected with a replacement river crossing. None of these safety problems would be solved with the No-Build Alternative. A supplemental river crossing would improve safety for southbound I-5 traffic and transit because those vehicles would be placed on a new bridge built to current safety standards, but would only provide partial safety improvements for northbound I-5 traffic. Northbound traffic would remain on the existing bridges, and would

still be subjected to bridge lifts and poor sight distances due to the "hump" in the current crossing. A supplemental crossing would create a new safety issue between Marine Drive and Fourth Plain Boulevard by dividing and separating northbound lanes approaching the crossing. As explained earlier, northbound traffic exiting the highway at Hayden Island, SR 14, Mill Plain, or Fourth Plain would need to merge into the two right lanes as the highway crosses Hayden Island. The multiple weaving, merging, and diverging sections along this two-lane segment of I-5 would result in substantial congestion, and cause traffic to back up on on-ramps and local streets around Marine Drive and on Hayden Island. Creating the additional conflict points could result in an increase in crashes. The need to make this choice so early could cause last-second weaving between lanes and would likely increase collision rates. Fewer auxiliary lanes with the supplemental alternative would provide less safety improvement than the replacement alternative.

Substandard Bicycle and Pedestrian Facilities

The existing pedestrian and bicycle facilities throughout the Project main project area are outdated, potentially unsafe, and confusing to navigate. Several pedestrian and bicycle forecasting scenarios predict that pedestrian and bicycle travel demands would increase substantially if a new I-5 bridge is constructed with sufficient multimodal facilities. The SA provides wider, safer pedestrian and bicycle facilities and connections. The existing 3- to 4-foot wide paths on each side of the current structures would be replaced with a new multi-use pathway under the highway deck.

The bicycle and pedestrian connection between Portland and Vancouver would differ between replacement and supplemental river crossings. Both river crossings would provide a wide, well-marked path separated from vehicles, but the replacement crossing would provide better connections and safety for bicyclists and pedestrians on Hayden Island and over North Portland Harbor. With a replacement river crossing, the multi-use path would be a continuous pathway, separated from cars and trucks, between downtown Vancouver and the Marine Drive interchange area. The supplemental river crossing would require pedestrians and bicyclists to leave the multi-use trail on Hayden Island and navigate several busy streets to complete the crossing between Vancouver and Marine Drive.

Seismic Vulnerability

The SA would replace the existing I-5 bridges with new and retrofitted structures built to modern seismic standards. It would also apply modern seismic safety standards to the other interchange and highway improvements constructed as a part of the Project. This would improve public safety and structure stability during earthquake seismic events.

The existing facilities would be retained under the No-Build and supplemental alternative options. The existing facilities were built with the understandings of earthquake science in 1917 and 1958 and have greater seismic vulnerability than a replacement structure.

Other Key Findings

Land Use

Accommodating Future Waterfront Development

Plans for waterfront development in downtown Vancouver would be better supported by a replacement river crossing. A replacement crossing would open up the waterfront underneath the existing bridges. A replacement crossing would vacate the existing I-5 right-of-way underneath the BNSF railroad berm, thus allowing Vancouver's planned extension of Main Street south to Columbia Way. The supplemental river crossing would leave the existing highway in place, which would not afford space for extending Main Street or provide the opportunity to open up the waterfront area beneath the existing bridges. Extending Main Street would strengthen the connection between downtown Vancouver and the riverfront, and it is important for traffic circulation needed by planned development.

Transit Oriented Development

Both bus rapid transit and light rail have the potential to attract development around transit stations (often referred to as transit-oriented development) that is generally sought after by many local and regional land use plans. However, light rail is likely to attract more transit-oriented development than bus rapid transit; therefore, it is more consistent with local and regional land use plans. Rail lines have greater visibility and appeal than buses, and studies have shown that because of this, some riders prefer trains over buses. These factors, in addition to the perception that rail infrastructure is a more permanent and fixed public investment than bus routes, indicate that developers are more likely to invest around light rail stations than around bus rapid transit stations. Transit-oriented development is generally pedestrian-oriented. Medium- and high-density commercial and residential mixed uses that support the nearby transit service also help advance community goals of managing growth and reducing reliance on automobiles.

Capital and Maintenance Costs for River Crossing

Cost estimates indicate that the supplemental river crossing would be less expensive to construct, but would be more expensive to maintain and operate. Reusing the existing bridges would reduce capital costs, but would require repairs to these structures, such as resurfacing the bridge decks and repairing the lift span equipment. These repairs are the primary contributor to the substantially higher maintenance and operation cost of a supplemental river crossing. The existing bridges also require staffing 24 hours per day to operate the lift spans, adding to their operating cost.

Capital and Maintenance and Operation Costs for Transit

Relative to bus rapid transit, light rail costs more to build, but has lower operating and maintenance costs, and attracts more transit riders. Light rail transit is about 20 percent more cost effective than bus rapid transit. Transit cost-effectiveness is generally described as the overall cost for construction, maintenance, and operation of the transit system, divided by the number of transit passengers served. Increasing transit ridership or reducing costs can improve cost-effectiveness. Overall, the cost to construct and operate per transit rider for light rail is lower

than for bus rapid transit. Therefore, light rail would be more cost-effective than bus rapid transit.

Key Findings Regarding Other Design Elements

Based on public comments and other agency input between the DEIS and FEIS, several other refinements were made about design elements for the SA. Each design element is a significant part of the SA. The Project Sponsors Council (PSC), the Independent Review Panel (IRP), and the Bridge Review Panel (BRP) played key roles in these decisions. Descriptions of the PSC, IRP and BRP can be found in Section 2.7 of the FEIS.[1]

The following section describes refinements that have shaped the SA and reasons for the recommendations. Most of these refinements were made after the adoption of the LPA by local agency partners but prior to publication of the FEIS. The refinements were re-evaluated and none were found to create a new significant environmental impact that would require the DEIS to be supplemented.

Marine Drive Interchange Design

The Marine Drive interchange design included in the SA is similar to the "diagonal" alignment analyzed in the EIS. The DEIS evaluated three designs for the Marine Drive interchange that differed in the alignment of Marine Drive west of I-5. These designs included an option for retaining most of the existing alignment, and two designs that realigned the roadway south of its current location. Following the adoption of the LPA, the Project established the Marine Drive Stakeholder Group to provide feedback on the function and design of the Marine Drive interchange. This advisory group was comprised of a range of stakeholders with strong interests in the design and operation of this interchange, including TriMet, ODOT, the City of Portland, the Port of Portland, trucking and distributions companies, the Audubon Society, nearby property owners such as Diversified Marine and the Metropolitan Exposition Recreation Commission, and community members from the surrounding Bridgeton, Kenton, and East Columbia neighborhoods.

Working with this advisory group, the Project analyzed the traffic operations, property impacts, and potential environmental effects for a range of interchange designs. The Marine Drive interchange design included in the SA was developed in collaboration with this stakeholder advisory group to balance many competing interests, including freight mobility, property impacts to the Expo Center and other nearby properties, financial considerations, and environmental effects. The design included in the SA is within the range of impacts of the options analyzed in the DEIS and FEIS.

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[1] The Governors of Oregon and Washington formed the PSC, IRP and BRP. The PSC advises the departments of transportation on project development. The PSC is comprised of executive or elected officials (plus two citizen co-chairs) from local and state agencies involved in the planning and decision making for the CRC project. The IRP was asked to do the following: (a) review the project implementation plan, (b) review the project finance plan, (c) review project performance measures. The BRP was comprised of individuals with national and international experience designing, managing and constructing large bridge projects. The BRP's primary recommendations focused on bridge type.

Hayden Island Interchange Design

The DEIS and FEIS evaluated options for the Hayden Island interchange which could accommodate a replacement or supplemental bridge. After publication of the DEIS, the City of Portland adopted the Hayden Island Plan which calls for access to and from the island without using I-5.

The (PSC) convened a committee, called the Integrated Project Staff (IPS), to create recommendations to refine the Hayden Island interchange. The IPS worked with local stakeholders and the Project to develop a design for the interchange which includes a local multimodal bridge to carry traffic to/from the island and Marine Drive. The interchange design allows all movements to and from the island and I-5, but also provides a local route to the island without accessing I-5. This design would allow for the elimination of direct ramps between Hayden Island and the Marine Drive interchange, thereby simplifying traffic operations and reducing the Hayden Island interchange footprint. On August 9, 2010, the PSC voted unanimously to recommend the refined Hayden Island interchange to be included as the preferred design in the LPA.

Number of Lanes on the River Crossing

The SA includes 10 lanes on the main river crossing. The DEIS evaluated highway alternatives with cross-sections ranging from 8 to 12 lanes at the river crossing. Following the July 2008 adoption of the LPA, the PSC met several times to discuss the number of lanes, noting concerns and interests about this design element of the project. The discussion included how the number of add/drop lanes relates to safety and mobility, traffic diversion, greenhouse gas emissions, and congestion; how they might indirectly affect traffic demand and land use; and the need to build this bridge to meet long-term regional needs.

On August 9, 2010, the PSC voted unanimously to recommend that the replacement bridges be constructed with 10 lanes and full shoulders to provide for safe operations between interchanges and efficient movement of people and goods. Traffic analysis showed that 10 lanes would perform better than 8 lanes and therefore would better meet the Purpose and Need of the project. Three lanes on each bridge would be through lanes for traffic traveling through the project area, while the additional lanes on each bridge would be add/drop lanes that would accommodate traffic entering or exiting I-5 at one of the several closely spaced interchanges immediately north and south of the river.

Number of Bridges over the Columbia River

The DEIS evaluated a two-bridge design (stacked transit/highway bridge) and a three-bridge design over the Columbia River for the replacement crossing. The three-bridge design included (from east to west) a bridge for northbound I-5 traffic, a bridge for southbound I-5 traffic, and a third bridge for light rail with a separated pathway for bicyclists and pedestrians. A two-bridge design included the two bridges for north and southbound I-5 traffic, with light rail, bicyclists, and pedestrians traveling underneath the decks of these bridges.

Compared to the three-bridge design, several advantages of the two-bridge design were identified in the DEIS and the FEIS, including fewer piers with less in-water structure, smaller surface area generating less stormwater runoff, and a more compact crossing with less imposing visual obstruction of the river. Additionally, advisory groups and the PSC recommended

preference for a two-bridge design. Therefore, the two-bridge design is being selected as the design for the SA.

River Crossing Bridge Type

The decision to select the composite deck truss bridge type for the river crossing was based on many factors. As described above, the BRP was formed to provide recommendations on bridge type (the BRP's role is described in detail in Chapter 2 of the FEIS). The panel offered three bridge types for consideration that panel members believed would have less construction risk and be potentially less expensive to construct than the open web bridge type that was being considered at the time. The three options were: composite deck truss, cable stayed and tied arch.

In response to the BRP's options, ODOT and WSDOT recommended proceeding with the composite deck truss bridge type. The ODOT and WSDOT recommendation found that the composite deck truss is the most affordable, maintains the project schedule, minimizes environmental impacts, honors commitments to communities and stakeholders, would attract the largest pool of contractors thus allowing for the most competitive prices, and provides the least risk.

A NEPA reevaluation was also completed comparing the impacts from the composite deck truss bridge design to the impacts from the bridge designs evaluated in the DEIS (the DEIS did not specify a bridge type but instead defined the bridge based on a size, height, and width envelope). The reevaluation found that impacts from the composite deck truss bridge design would be similar, and FTA and FHWA determined that a supplemental DEIS was not necessary.

ODOT and WSDOT considered many factors to make the decision on preferred bridge type including, but not limited to, reducing and eliminating risks to project schedule and budget, affordability, impacts, and securing funding. The public, stakeholders, project advisory committees, other project sponsors, and local elected officials commented on the bridge type options. Listening sessions were held to receive public comment. On April 25, 2011, the Oregon and Washington governors announced the selection of the composite deck truss as the preferred bridge type which was subsequently adopted by the Project Sponsors.

Tolling

Tolling of cars and trucks that use the I-5 river crossing is included in the SA as a proposed method to help fund the project and to encourage the use of alternative modes of transportation. The DEIS evaluated four tolling scenarios: no toll, "standard" variable tolling rate on the I-5 crossing, "higher" variable tolling rate on the I-5 crossing, and a "standard" variable tolling rate on both the I-5 and I-205 crossings. The "standard" variable tolling rate evaluated tolls ranging from $1 to $2 each direction, while the "higher" variable tolling rate ranged from $1 to $2.50.

The FEIS used the "standard" variable tolling rate for the financial analysis. The toll would be included as a demand management and financing tool. The FEIS analyzed a variable toll rate, and the higher toll during peak hours would encourage travel during off-peak hours. Additionally, tolling provides a funding stream that will be used toward construction of the project.

The SA is expected to apply a toll on vehicles using the I-5 crossing.

Bridge Height

The existing Columbia River bridge primary channel provides a vertical clearance for marine vessels of 40 feet above zero stage of the Columbia River Datum (CRD). The alternate barge channel has a vertical clearance of 69 feet CRD. The primary channel also has a liftspan that can open to provide 179 feet CRD of vertical clearance. Bridge lifts cause substantial I-5 traffic congestion and result in more traffic crashes, and are therefore restricted to off-peak traffic periods.

The SA includes a fixed span, mid-level replacement bridge with a vertical clearance of 95 feet CRD. The proposed bridge height and pier configuration were based on input from and coordination with the United States Coast Guard (USCG), Federal Aviation Administration, the river users in the area (including a boat survey to identify the types of marine vessels that cross under the bridge, and a preliminary hearing for river users by the USCG), a robust public process, and technical and qualitative analysis, as noted in the FEIS and supporting documents. A mid-level bridge configuration is part of the SA because it meets all relevant elements of the project purpose and need, provides benefits to nearly all river users crossing under the bridge, and results in the best balance of minimizing impacts and providing benefits.

The project conducted a series of studies and stakeholder outreach to determine the appropriate navigation clearance for the proposed bridges. Many factors were considered in these studies, including marine vessel height, the safe and efficient operation of aviation, highway, light rail, and the multi-use path for bicycles and pedestrians. The project considered low-level, mid-level and high-level bridge configurations during the pre-DEIS screening. Analysis found that high-level bridges would not adequately meet the purpose and need due to the effects on aviation safety (a high level bridge would substantially increase encroachment into the protected airspace of Pearson Field). A low-level bridge would not adequately address navigation or highway safety. Other constraints for a high-level bridge include concerns related to safe and functional operation of the highway, transit, and multi-use path facilities. A mid-level bridge (95 feet CRD vertical clearance) balances the various needs, allowing the main river crossing structure to make much easier connections to interchanges, surface streets, and transit stations in a safe manner, consistent with design standards, and with lower environmental impacts. A higher bridge would include additional hazards to aviation, operational and safety impacts to highway, operational, safety and maintenance impacts to transit, and increased environmental impacts, including increased impacts to Section 4(f) properties that the U.S. Department of Transportation has a duty to minimize.

As noted in the FEIS, the 95 foot CRD bridge height would serve and benefit nearly all marine vessels and loads, but would constrain a small portion of river use by three known river users. Much of this impact could be offset by partially disassembling the infrequent tall loads or masts. Other mitigation measures will be evaluated in the USCG Section 9 permit process (see attached Appendix A - Project Mitigation Commitments). Providing a high-level crossing could allow these occasional vessels and loads to pass under the bridge without disassembling, but this option was not advanced because it would result in reduced ability to meet the project purpose and need, additional hazards to aviation safety, decreased functionality for highway and transit service, added construction costs, and added impacts on significant historic and cultural resources and local traffic circulation. For these reasons, a mid-level bridge was selected to improve aviation safety; and accommodate and balance the reasonable need for navigation with

the needs of all other users in the area including air, highway, transit, bicycle and pedestrian as noted in the Project's Purpose and Need.

Light Rail Alignment over Hayden Island

The DEIS evaluated two transit alignments over Hayden Island, both on the west side of I-5. One option aligned transit adjacent to the I-5 interchange, and another offset it approximately 450 feet west of the I-5 interchange. Since the publication of the DEIS, the City of Portland completed a separate planning and outreach process that yielded a Hayden Island Plan, which includes a vision for how the incorporated portion of this island should develop and/or redevelop. This plan includes a preference for the light rail transit alignment adjacent to the I-5 interchange. The SA design includes the adjacent transit alignment on Hayden Island.

Light Rail Alignment in Downtown Vancouver

The SA includes a couplet for the north-south transit alignment through downtown Vancouver. The DEIS evaluated two transit alignment options through downtown Vancouver—two-way travel on Washington Street, or a couplet with northbound travel on Broadway Street and southbound travel on Washington Street. Following the adoption of the LPA in the summer of 2008, the project formed the Vancouver Working Group (VWG), composed of residents, business owners, transit-dependent populations, and commuters in the Vancouver area. This group met regularly to provide feedback, invite public input, and develop recommendations to the Project, City of Vancouver, and C-TRAN on preferred transit alignments and proposed station locations. Project staff, working with the VWG, identified several advantages of the couplet, including better support for development potential in downtown and the ability to accommodate more uses on these streets than could be afforded with a two-way transit guideway on Washington Street. On March 19, 2009, the VWG recommended that light rail run on the couplet on Washington and Broadway Streets through downtown Vancouver. Project Sponsors accepted the recommendation and the Washington-Broadway couplet is included in the SA.

Light Rail Alignment East-West to Clark College

The EIS evaluated two east-west transit alignment options to connect the north-south downtown Vancouver alignment to the light rail transit terminus at the Clark Park and Ride: two-way travel on McLoughlin Boulevard, and two-way travel on 16th Street. The VWG explored McLoughlin Boulevard, 16th Street, and 17th Street as possible alternative east-west connections. The 17th Street alignment was not analyzed in the DEIS, but a NEPA reevaluation was completed in which FTA and FHWA determined that impacts from the 17th Street alignment were within the range of impacts from the 16th Street and McLoughlin alignments. Following approximately 5 months of coordination, in addition to public open houses and walking tours, the VWG was nearly evenly split between the 17th Street and McLoughlin alignments as the east-west connection to the Clark Park and Ride. The 16th Street alignment was dropped from considerations due to cost, speed, and safety considerations.

Upon learning about the VWG's split vote of the east-west alignment, members of Vancouver City Council and C-TRAN's Board of Directors advised the Project to more thoroughly investigate both the McLoughlin Boulevard and 17th Street alignments. From November 2009 until February 2010, Project conducted extensive technical work and public outreach regarding these alignment options. Based on this additional research and public input, the City of

Vancouver Council (March 22, 2010) and C-TRAN Board of Directors (April 13, 2010) voted to adopt the 17th Street alignment.

Station and Park and Ride Locations

The EIS evaluated station locations associated with multiple light rail alignments. In Vancouver, the Broadway-Washington couplet alignment in the DEIS included a pair of stations near 6th Street, a pair of stations between 11th and 12th Streets, a pair of stations between 15th and 16th Streets, and a station near the Clark Park and Ride. Additional investigation completed since the DEIS found design constraints that required the relocation of two pairs of stations. The stations near 6th Street were combined into one station between 5th and 6th Streets. This move was made so the stations would not need to be placed on a curve, which requires closing traffic, and so the combined station could be placed as close as possible to the Columbia Park and Ride. The stations between 11th and 12th Streets in the DEIS were moved to between 9th and Evergreen Streets. This move was based on proximity to planned development in downtown Vancouver, including the Riverwest development, much of which is expected to occur in the southern part of downtown.

On Hayden Island, transit station location was determined after meetings with the City of Portland, TriMet, and discussions with the Portland Working Group.

The EIS also evaluated multiple park and ride locations associated with the transit alignments. Since publication of the DEIS, the light rail alignment has been defined and three park and ride locations (Clark, Mill and Columbia) selected from the DEIS options. These three park and ride locations were evaluated in the DEIS. Expected utilization of parking spaces, cost-effectiveness, transit operations, and traffic modeling were considered by project staff when recommending the proposed park and ride locations. Upon selection of the Clark College area as the terminus of the light rail alignment, it was determined that three park and ride stations in their proposed locations would be the most cost-effective option. The decisions on station and park and ride locations were made in coordination with the City of Vancouver and C-TRAN.

Cost Reduction Measures

Below are elements of the project design that were modified from the original design of the LPA to reduce construction costs. These modifications would reduce some of the project benefits but would still allow the project to meet the Purpose and Need. None of these design changes would result in any additional significant environmental impacts.

These cost reduction measures include:

Retain the existing North Portland Harbor bridge: This would utilize the existing North Portland Harbor bridge for mainline I-5 traffic. By reusing the existing bridge, the freeway across Hayden Island would be shifted slightly east from the designs evaluated in the DEIS.

Lower the Hayden Island interchange onto fill and retaining walls: The DEIS alternatives assumed the Hayden Island interchange ramps and freeway mainline would be on fill. However, after the DEIS, the project team investigated the option of supporting the interchange on structures. That option would be more expensive and was not forwarded to the FEIS.

Eliminate one proposed northbound add/drop lane on I-5 from SR 14 to SR 500: The connection from SR 14 to the I-5 northbound collector-distributor would be one lane, rather than two lanes. This slightly reduces cost, actually provides for a smoother transition on the collector-distributor

by reducing the number of merging movements, and provides preference to the I-5 traffic. The result is one less add/drop lane on northbound I-5 between the SR 14 and the SR 500 interchanges. The structures over I-5 and the retaining walls on either side of I-5 would be constructed to allow this additional lane in the future, but this lane would not be built as part of the project.

Potential Construction Phasing

It is common for large projects to be built in phases to match the availability and timing of construction funds. If any phasing occurs outside what is contemplated in the FEIS, an environmental re-evaluation will take place to determine whether any new significant environmental impacts would occur that would require supplemental NEPA evaluation and documentation.

Project Mitigation Commitments

Attachment A, which is incorporated herein by reference, describes the mitigation measures that will be implemented with the SA under this ROD and may be relied upon by other federal permits or approvals from agencies including the USCG, the U.S. Army Corps of Engineers (USACE), Federal Aviation Administration (FAA), National Marine Fisheries Service (NMFS), and the U.S. Department of the Interior. The mitigation commitments were identified in the FEIS and updated, as necessary, for this ROD. Implementation of the mitigation measures in Attachment A are material conditions of this ROD and will be incorporated in any funding agreement or approval that the FTA or FHWA may provide for the construction of the Project. FTA and FHWA find that with the accomplishment of these mitigation commitments, the project sponsors will have taken all reasonable, prudent and feasible means to avoid or minimize impacts from the Project.

Some mitigation measures were suggested, but were not found to be relevant, practicable, useful or prudent, including:

- *Establish a community enhancement fund.* In the last three years the CRC project team, the PSC, and CRC advisory groups have focused on incorporating a wide range of community enhancements into the project. The project has looked for ways to leverage the highway and transit investments into additional improvements for project neighbors and local communities. These improvements are beyond the benefits identified as the Project's Purpose and Need. These tangible improvements include new local roads and improved local flow and connections for Hayden Island residents; better bike and pedestrian access to the improved facilities; new bike and pedestrian trails; and a separate bridge for local auto access from North Portland to Hayden Island. These enhancement elements have been included based on input from the community.

  The project team remains committed to aggressively maximizing and leveraging resources to bring additional benefits and improvements to our community. Two options have been identified for further exploration, both include a financial set aside of a specific amount dedicated to a specific purpose. One approach is a project specific community enhancement fund. There is some history with such an approach—the Delta Park 1-5 widening project (2006) and Metro's solid waste program (1991) are two examples. The other approach is a different concept, a regional fund established by the state to benefit the neighborhoods and

communities in close proximity to I-5 and the Project area. Both approaches have been successfully implemented in the Portland region and will help inform this effort. Both approaches have limitations and legal restrictions associated with anticipated funding sources. Both will require legislative support.

- *Identify project area air quality sensitive receptor locations in the ROD and ensure that mitigation commitments address these areas.* The project is not identifying sensitive receptors in the ROD but will meet the intent of the recommendation by applying rigorous requirements for minimizing emissions throughout the project whether sensitive receptors are in the area or not. As project design advances, measures to minimize air quality impacts to sensitive receptors will be incorporated, such as requiring the construction contractor to locate emissions-producing sources away from sensitive receptors, as much as practicable.
- *Include commitments for additional emissions controls for construction equipment in the ROD, such as, requiring retrofitting of construction equipment.* ODOT and WSDOT are committing to air quality mitigation during construction. Their goal is to reduce construction-related emissions in the most efficient means possible. Many strategies to minimize the effects of emissions during construction would be developed during the design phase. Therefore, it is not prudent to commit to specific measures now that may not be as effective as other measures.

  The project has not committed to compel contractors to install emission control devices beyond those legally required because (1) the analysis to-date indicates that construction activities are not likely to result in air quality violations, (2) additional control technologies can be cost prohibitive to many smaller contractors and could eliminate their ability to pursue work on the project, (3) the added costs of this technology may provide greater benefit if directed toward other measures to minimize construction-related impacts, and (4) the technological and regulatory environment are evolving relatively rapidly, so it would not be prudent to commit to any particular technology at this time. The project has committed to require contractors to use rigorous dust control practices and operational measures to reduce emissions during construction, as described in this ROD. The project has also committed to continue to monitor and evaluate advances in emission control technology and related regulations, to further evaluate how added requirements might affect contracting and costs, and to finalize decisions regarding any additional emission controls during final design.

  Stationary sources such as concrete and asphalt mix plants are generally required to obtain air permits, from the Oregon Department of Environmental Quality (DEQ) or the Southwest Clean Air Agency (SWCAA), and to comply with regulations to control dust and other pollutant emissions. As a result, their operations are typically well controlled and do not require additional project-specific mitigation measures.
- *Include baseline health data in the ROD, and use it to inform further mitigation commitments with respect to asthma and other health impacts from the project and cumulative effects.* The Project is improving air quality in the long term, compared to the no-build alternative, and is not forecast to result in any violations of air quality standards either during construction or over the long term. Therefore, the Project is not committing to additional mitigation for air quality related health impacts. Baseline health data are not

needed to estimate the air quality impacts, and are not available at the level of detail or relevance to be used to further inform impacts or mitigation. However, the Project is committed to implementing measures, above and beyond regulatory requirements, to reduce construction-related emissions.

- *Consider providing free or discounted transponders and transit passes to low income (environmental justice) residents.* Impacts from the addition of a toll would be greatly offset by increased transit service and reliability, improved safety and reduced congestion on the highway, and improvements to the bike and pedestrian network, giving low income residents more reliable and safer options of transportation across the river. This also improves access to employment, education, housing and services. As addressed in the FEIS, the toll would not constitute a disproportionately high and adverse impact to environmental justice populations. The project will continue to explore means of offsetting the impact of tolls, including transponder acquisition. There are some local discounted transit passes for low-income populations, and the specifics of this program will be assessed as the project continues toward opening.

- *Acknowledge and propose mitigation for potential long-term/permanent social, economic, and/or environmental effects due to phased implementation.* The FEIS evaluates a reasonable phasing option, and identifies impacts and mitigation for that phasing option. The timing of funding, however, cannot be known at this time, and therefore exact phasing will not be known until funding is know, which occurs after the ROD. If any phasing occurs outside what is contemplated in the FEIS, an environmental re-evaluation will take place to determine if it would result in any meaningful changes in impacts, and how they would change the necessary mitigation.

- *Mitigate impacts to river navigation from the reduction of vertical clearance to 95 feet by increasing the vertical clearance to 125 feet.* Increasing the height of the proposed Columbia River bridges to provide 125 feet of vertical clearance has many impacts to the safety, cost and impacts of the overall project. These impacts include additional hazards to aviation, operational and safety impacts to the highway, operational, safety and maintenance impacts to transit, and increased environmental impacts, including increased impacts to Section 4(f) properties that the U.S. Department of Transportation has a duty to minimize. The compromises result in a reduced benefit for five out of the six specific needs addressed in the project's Purpose and Need Statement when compared to the current alternative. An initial assessment of all known and quantifiable costs attributable to the increase in vertical clearance for navigation ranges from approximately $105M to $150M.

  The selection of the crossing height (low, mid, or high level) for the proposed bridges over the Columbia River and the placement of the piers are affected by three primary constraints: aviation, navigation, and project geometry (i.e., roadway/transit/multi-use path).

  In evaluating crossing level and span length with respect to aviation, navigation, and project geometry shows that the mid-level structure would beneficially affect aviation and navigation. While the mid-level bridge does not favor any single interest, it benefits all interests in an equitable fashion with respect to the aviation and navigation constraints. This was the primary reason the mid-level crossing was selected by the Columbia River

Crossing Task Force and validated through six years of public input, including 27,000 public outreach contacts at about 900 events.

The project team conducted a series of studies and stakeholder outreach efforts to determine the appropriate navigation clearance for the proposed bridges. Many factors were considered in these studies. In addition to marine vessel height, the safe and efficient operation of aviation (Pearson Field), highway, light rail, and the multi-use path (bicycle and pedestrian) were considered.

The CRC project team conducted studies of current river usage and validated these studies through stakeholder outreach to determine what clearances are required by current river users. These efforts included a boat survey to identify the types of vessels that use the Columbia River at the project location, their frequency of usage, and required navigation clearance. Additionally, a series of telephone and/or face-to-face interviews were conducted with river users to validate and update the information contained in the boat survey. Along with these efforts, the USCG held a preliminary hearing on the Columbia River Crossing project to solicit comments from river users.

The information gathered from the above-mentioned studies and stakeholder outreach was considered in conjunction with the operational statutes for nearby Pearson Field and with requirements for safe and efficient operation of the proposed highway, light rail, and multi-use path facilities. Taking all of these considerations into account, it was determined that a 95-foot vertical clearance will allow all but three known and infrequent river users to navigate beneath the bridge at all times of year. Some of the users could partially disassemble so they could pass beneath a 95-foot vertical clearance.

- *Mitigate for impacts to aquatic species and habitats by restoring habitat nearer to the project area, instead of at Hood River and Lewis River.* As part of the Biological Assessment (BA) preparation, and in anticipation of two state and one federal permit, the CRC project team convened a working group (Conservation Measures Working Group) of permitting agencies that included NOAA Fisheries (NMFS), U.S. Fish and Wildlife Service (USFWS), the Oregon Department of Fish and Wildlife (ODFW) and the Washington Department of Fish and Wildlife (WDFW) to evaluate possible aquatic habitat restoration projects to offset adverse impacts. The working group developed goals, objectives and criteria that potential restoration projects within the Columbia River Basin would have to meet to qualify as potential mitigation for Endangered Species Act (ESA) impacts from the Project, as described in the CRC Guide to Project Sponsored Conservation (Guide). Solicitations for information were sent to groups conducting, or involved with, aquatic habitat restoration projects throughout the Columbia River Basin, including all tribes. This effort resulted in a list of over 100 potential aquatic habitat restoration projects that would provide habitat benefits to specific ESA-listed salmonid runs. All project descriptions received from CRC's request for aquatic habitat restoration projects in the Columbia River Basin were compared against the Guide. The Lewis River Confluence Restoration Project in Washington and the Hood River Side Channel Restoration at river mile 1.0 in Oregon best met all of the Guide's goals and project selection criteria and obtained concurrence from the Conservation Measures Working Group members, as well as from staff from the Oregon Department of State Lands, USACE and the Environmental Protection Agency (EPA). There was general agreement

from the regulatory and natural resource agencies that these projects would provide significant benefit to native fishes and aquatic resources and more than adequately compensate for the adverse environmental effects from the Project.

Mitigation Monitoring and Enforcement

The Project Sponsors will establish and conduct a mitigation monitoring program during final design, construction, and operations with the goals of (1) helping the project fulfill the commitments set forth in the Environmental Review Documents and this ROD; and (2) giving FHWA and FTA a means of overseeing the effectiveness of and compliance with their mitigation requirements. The monitoring program will consist of four activities:

- Maintaining a current list or database matrix of mitigation commitments by the project.
- Tracking the status of implementation of the mitigation measures by the project.
- Reporting on the effectiveness of the mitigation measures implemented.
- Preparing and submitting quarterly reports to FHWA and FTA during the construction phase and then thereafter on a regular basis as determined by FTA and FHWA.

The environmental commitments shall be entered into a commitment tracking database matrix with the following information: FEIS references, a description of the measure, and the responsible party. Commitments that are the responsibility of contractors will be written in the contract specifications in language that is biddable by contractors, buildable in practice, and enforceable. Once responsibilities are assigned, the progress against each measure is tracked in the commitment tracking system. This ensures that the contractors and Project staff clearly know their respective responsibilities and assures the permitting agency that Project staff is fulfilling its commitments. The database matrix will function as the Project's single point of environmental compliance tracking for the Project. The status of each environmental commitment will be monitored and updated regularly by an environmental permitting specialist.

The CRC Project Environmental Manager will meet on a regular basis with design staff and will regularly review project designs to ensure coordination of design development with environmental commitments. The Environmental Manager will coordinate with the resource agencies to ensure early and constant communications of issues and requirements.

During the construction phase, ODOT and WSDOT will use a proactive approach for monitoring and inspecting field work to help guard against environmental violations that could potentially introduce cost and schedule impacts. Requirements and procedures will be developed during final design and described in contract provisions.

Determinations and Findings

The following sections summarize legal compliance with the relevant environmental laws:

National Environmental Policy Act

The National Environmental Policy Act, (NEPA) found at 42 U.S.C. 4371 et seq., requires that federal agencies evaluate the environmental impacts of their actions and integrate such evaluations into their decision-making processes, and that each federal department and agency affecting the environment implement appropriate policies. The environmental record for the

Columbia River Crossing project includes the previously referenced Columbia River Crossing DEIS (May 2008), the 17th Street Technical Memorandum (March 2010), Composite Deck Truss Bridge Type NEPA Re-evaluation (March 2011), Steel Bridge Documented Categorical Exclusion (November 2010), Environmental NEPA Re-evaluation (May 2011), and the Columbia River Crossing FEIS (September 2011). These documents, all incorporated herein by reference, represent the detailed statements required by NEPA 49 U.S.C. Section 5324(b), 23 U.S.C. 109(h).

Having carefully considered the environmental record noted above and findings below, the mitigation measures as required in Appendix A herein, and the written and oral comments offered by other agencies and the public on this record, and pursuant to 49 U.S.C. Section 5324(b) for consideration of economic, social, and, environmental interests, FTA and FHWA have determined that:

- The environmental documents include a record of the environmental impact of the proposal; adverse environmental effects that cannot be avoided; alternatives to the proposal; and irreversible and irretrievable impacts on the environment.
- FTA and FHWA have cooperated and consulted with the Secretary of the Interior and the Administrator of the Environmental Protection Agency on the Project;
- The Project has undertaken extensive outreach efforts and many opportunities for public and agency comment have been provided.
- Public hearings on the project have been held and FTA and FHWA have reviewed each transcript submitted under 49 U.S.C. 5323(b) and make the following findings:
  (a) an adequate opportunity to present views was given to all parties having a significant economic, social, or environmental interest;
  (b) the preservation and enhancement of the environment and the interest of the community in which the project is located were considered;
  (c) all reasonable steps have been taken to minimize adverse environmental effects of the proposed project;
  (d) where adverse environmental effects are likely to result from the project, no feasible and prudent alternative to the effect exists and all reasonable steps have been taken to minimize the effect;
  (e) the Project meets its Purpose and Need, and the requirements of NEPA and 49 U.S.C. §§ 5323(b) and 5324(b) have been met.

Clean Air Act

The Project is subject to conformity requirements imposed by the Clean Air Act (CAA) found at 42 U.S.C. 7401 et seq. The CAA requires that transportation projects conform to the purposes of State Implementation Plans and Maintenance Plans for air quality. Conformity means that the transportation project will not produce new violations of the National Ambient Air Quality Standards (NAAQS) established by EPA, worsen existing violations, or delay timely attainment of NAAQS.

The EPA conformity regulation (40 CFR Part 93) establishes criteria that a transportation project must meet in order to be found by the FHWA and FTA to conform to Implementation and

Maintenance Plans. The conformity criteria that the Project is subject to are that the project must be included in a conforming Regional Transportation Plan and Regional Transportation Improvement Program, and that the project not cause or contribute to any localized violation of NAAQS as determined through "hot-spot" analysis. The Project is located within the Portland and Vancouver carbon monoxide (CO) maintenance areas. Because of that, both the DEQ and SWCAA have individual Maintenance Plans that the Project must be in conformance with.

As described in Chapter 3.10 of the FEIS, federal approval for the conformity determination for Metro's 2035 Regional Transportation Plan (RTP) and the 2008-2011 Metropolitan Transportation Improvement Plan (MTIP) was provided by FHWA and FTA on September 20, 2010. Metro included a placeholder assumption for the Project in the regional conformity determination they conducted, and the SA is consistent with that placeholder assumption. The Vancouver Air Quality Maintenance Area Second 10-Year Limited Carbon Monoxide Maintenance Plan received a finding of adequacy from EPA in December 2007. As a result, regional conformity demonstration is no longer required for projects in the Vancouver area. As also described in Chapter 3.10 of the FEIS, "hot-spot" analysis of CO levels at congested intersections in Portland and Vancouver was performed and demonstrated localized compliance with federal and state CO standards. Under the transportation conformity rules found at 40 CFR 93.123 (c)(5), CO, PM_{10}, and $PM_{2.5}$ hot-spot analyses are not required to consider construction-related activities which cause temporary increases in emissions. Each site which is affected by construction-related activities shall be considered separately, using established "Guideline" methods. Temporary increases are defined as those which occur only during the construction phase and last 5 years or fewer at any individual site.

Although construction will last more than 5 years, project construction activities at any one site are not expected to last more than 5 years. Thus, a CO hot-spot analysis was not conducted. If, as more information is known, construction at any one staging site is expected to last more than 5 years, a hot-spot analysis will be completed.

Additionally, ODOT and WSDOT will pursue emerging technologies for cleaner construction emissions, such as the use of diesel scrubbers for compatible equipment, and continue to encourage and require those types of technologies as bidding laws allow.

Because the Project is a part of the conforming regional transportation plans (RTP and MTIP) for the Portland metropolitan area, and because the Project will not create new localized violations of NAAQS, worsen an existing violation, or delay timely attainment of NAAQS, the FHWA and FTA find that the Project conforms with the Portland and Vancouver Maintenance Plans in accordance with EPA regulations governing such determinations.

Clean Water Act's Water Quality Requirements

The Clean Water Act 33 U.S.C. 1251 et seq. establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. The Clean Water Act made it unlawful to discharge any pollutant from a point source into navigable waters, unless a permit was obtained. EPA's National Pollutant Discharge Elimination System (NPDES) permit program controls discharges. The Clean Water Act also regulates polluted runoff to surface waters. While the Clean Water Act is a federal regulation, review and approval of permits for NPDES and water quality certifications have been assigned to DEQ and the Washington State Department of Ecology in Oregon and Washington, respectively.

To mitigate the effect of pollutants in runoff from additional impervious surface area, the Project team has prepared a conceptual stormwater management design. The design was prepared to meet the requirements of ODOT and WSDOT for those portions of the project along I-5. After consultation with and agreement from WSDOT and State of Washington regulatory agencies, the project has adopted ODOT's technical memorandum on stormwater quality on a project-wide basis to provide a standard approach to determining types of water quality facilities. The memorandum is the result of a collaborative effort by ODOT, FHWA, and the following natural resource agencies: NMFS, DEQ, USFWS, EPA, and ODFW. The decision to use this approach on the Project has been endorsed by WSDOT and the Washington State Department of Ecology.

The Cities of Portland's and Vancouver's regulations, found in the 2008 City of Portland Stormwater Management Manual and 2005 Stormwater Management Manual for Western Washington, respectively, will be implemented for those portions of the project along city-managed roads.

With the use of state and local regulations and standards, and conformance with the WSDOT, ODOT, City of Vancouver, and City of Portland NPDES permits, FHWA and FTA find that the Clean Water Act requirements have been addressed by the Project to the level necessary to complete the NEPA analysis.

Navigation and Navigable Waters, the General Bridge Act of 1946, and Section 9 of the Rivers and Harbors Act

33 U.S.C. Section 491 (Navigation and Navigable Waters) states, in part, that for any persons proposing "to construct and maintain a bridge across or over any of the navigable waters of the United States, such bridge shall not be built or commenced until the plans and specifications for its construction, together with such drawings of the proposed construction and such map of the proposed location as may be required for a full understanding of the subject, have been submitted to the Secretary of Transportation for the Secretary's approval…"

The General Bridge Act of 1946, found at 33 U.S.C. §§ 9 and 11 and in regulations 33 CFR Sections 114 and115, was enacted to preserve the public right of navigation and prevent interference with interstate and foreign commerce. This act requires a USCG bridge permit to construct a new bridge or reconstruct or modify an existing bridge over navigable waters of the United States. This permit is often referred to as a Section 9 permit under the Rivers and Harbors Act; however, the primary authority relied on by the USCG now for issuance of such permits is the General Bridge Act of 1946. 33 U.S.C. Section 512 and the implementing regulation at 33 CFR Section 116.01 also provide that in evaluating bridge alternations, the Secretary shall provide due regard to the necessity of free and unobstructed water navigation and to the "necessities of the rail or highway traffic".

The Project conducted a series of studies and stakeholder outreach efforts to determine the appropriate navigation clearance for the proposed bridges. Many factors were considered in these studies. The Project met on a number of occasions with representatives of the U.S. Coast Guard to discuss the project and bridge height. The U.S. Coast Guard, as the Project NEPA cooperating agency, was also provided an administrative review copies of the DEIS and FEIS prior to publication for review and comment. In addition to marine vessel height, the safe and efficient operation of aviation (Pearson Field), highway, light rail and the multi-use path (bicycle and pedestrian) were considered.

Prior to engaging in bridge construction or demolition activities, the Project will submit the necessary plans, specifications, drawings, and maps to the Secretary of Transportation for the Secretary's approval. The Project will apply for a Section 9 permit and will ensure that the Project complies with all permit conditions. Accordingly, FHWA and FTA find that Title 33 Navigation and Navigable Waters, the General Bridge Act of 1946 and Sections 9 and 11 of the U.S. Rivers and Harbors Act have been addressed to the level necessary to complete the Project NEPA analysis.

Section 14 of the Rivers and Harbors Act and 33 U.S.C. Section 408 Civil Works Alteration Permit

33 U.S.C. 408 prohibits persons from impairing "the usefulness of any sea wall, bulkhead, jetty, dike, levee, wharf, pier, or other work built by the United States," and approval of USACE is required for any "alteration or permanent occupation or use" of such facilities. The Project includes new and modified structures on existing flood control levees and ground alteration within established levee zones. The Project has initiated discussions with USACE, and has indicated that it will apply for a Section 408 Civil Works Alteration Permit and will comply with all permit requirements. Accordingly, FHWA and FTA find that Section 14 of the Rivers and Harbors Act as codified in 33 U.S.C. 408 has been addressed to the level necessary to complete the NEPA analysis.

The Clean Water Act, Executive Order 11990 Protection of Wetlands and the role of NEPA

NEPA, the Clean Water Act (Sections 401 and 404), and Executive Order 11990 act to guide and regulate impacts to wetlands. NEPA establishes the process for evaluating the environmental impacts of projects such as the CRC project, including impacts to wetlands. This ROD concludes the NEPA process, which included the publication of the Draft and Final Environmental Impact Statements for the Project, which describe the Project's overall efforts to avoid, minimize, and mitigate for wetland impacts as required by other laws and policies. Executive Order 11990 requires federal agencies to minimize the loss or degradation of wetlands and enhance their natural state. The Clean Water Act, administered by USACE and EPA, regulates the placement of dredge or fill material into the waters of the United States, including wetlands under Section 404, and ensures that federally permitted projects are consistent with state water quality standards under Section 401.

As described in Chapter 3.15 of the FEIS, the Project footprint would not encroach upon any delineated wetlands and would not discharge untreated stormwater runoff into any wetlands. Based on mapped soils, aerial photographs, and observations from the public right-of-way, a wetland may exist between Vancouver Way and Marine Drive (identified as the potential Vancouver Way Wetland on FEIS Exhibit 3.15-3), and it may be impacted by the Project. However, because Project staff did not receive permission from the property owner to enter this property, the presence of a wetland could not be verified. Following the ROD, ODOT and FHWA will secure right-of-entry to the property containing the potential Vancouver Way Wetland in order to confirm the presence or absence of a wetland at this location. If presence is confirmed, then the Project would comply with the relevant regulatory and permitting requirements, including avoiding, minimizing, and mitigating wetland impacts. Accordingly, FHWA and FTA find that the Project has addressed wetland issues pertaining to Sections 404

and 401 of the Clean Water Act, NEPA, and Executive Order 11990 to the level necessary to complete the NEPA analysis.

NEPA also establishes the process for evaluating the environmental impacts of projects, such as CRC, on waterways of the United States. The evaluation is described in Chapter 3.15 of the FEIS. And, as with wetlands, Section 404 of the Clean Water Act regulates the placement of dredge or fill material into jurisdictional waters as well as jurisdictional ditches.

As required under Section 404, mitigation is required for the net 3,100 cubic yards of water in the Columbia River that the Project will displace, as well as the potential impacts to jurisdictional ditches that may occur. ODOT and WSDOT will be the applicants for necessary permits. The project would include mitigation plans and actions to identify and implement habitat protection, restoration, and enhancement as appropriate. These actions are intended to provide a net conservation benefit for the unavoidable impacts bridge construction and demolition have on species, habitats, and resource sites. Mitigation for impacts to jurisdictional ditches, if any occur, will likely involve reconstruction of the ditches and re-vegetation with native plants. Accordingly, FHWA and FTA find that NEPA and the Clean Water Act, as they relate to impacts to jurisdictional waters, have been addressed to the level necessary to complete the NEPA analysis.

Rivers and Harbors Act (Section 10 Waterway Structures Permit)

The Rivers and Harbors Act of 1899, codified at 33 U.S.C. 403 and regulations at 33 CFR 322, was passed to regulate the use, administration, and navigation on the navigable waters of the United States. Pursuant to Section 10 of the Rivers and Harbors Act, any activity or structure that obstructs or alters a navigable water of the United States must be permitted by USACE. Section 10 is managed generally as a companion to Section 404 of the Clean Water Act. Whereas Section 404 of the Clean Water Act regulates any dredged or fill material placed in United States waters, Section 10 regulates actual structures such as piling and stormwater outfalls, and only applies to navigable United States waters and not to associated non-navigable streams, wetlands, or drainage features.

Both the replacement bridge structures in the main stem of the Columbia River and the new bridge structures in the North Portland Harbor require a Section 10 authorization. The bridge structures in navigable United States waters are under the jurisdiction of USCG and the General Bridge Act of 1946. The Project will apply for a Section 10 authorization using the Joint Aquatic Resources Permit Application (JARPA) and USACE Joint Permit Application (JPA) forms. The Project will ensure that the Project complies with all permit conditions. Accordingly, FHWA and FTA find that Section 10 of the Rivers and Harbors Act has been addressed to the level necessary to complete the NEPA analysis.

The Safe Drinking Water Act of 1974 (Sole Source Aquifer)

The Safe Drinking Water Act of 1974, found at 42 U.S.C. Chapter 6A, Subchapter 12, Part C, Section 300H, requires that projects that are to receive “federal financial assistance” and which have the potential to contaminate an aquifer “so as to create a significant hazard to public health” are subject to EPA review and approval. North of the Columbia River, the I-5 corridor and other project facilities are underlain by the Troutdale Aquifer, an EPA designated Sole Source Aquifer (SSA) for the Vancouver area. The Project uses federal funds and was, therefore, required to produce an SSA report discussing potential groundwater impacts. This SSA report is included as

Appendix F of the Hazardous Materials Technical Report supporting the FEIS, and was submitted to EPA in 2009.

Pages 7-1 and 7-2 of the SSA report include extensive mitigation procedures designed to help ensure the protection of the Troutdale SSA. The EPA reviewed the SSA report, and in July of 2010 provided conditional approval to the Project. The conditions included a determination that the Project needs additional monitoring and reporting to ensure the Project does not pose a risk for contaminating the aquifer and may require additional mitigation measures. The project sponsors will comply with the additional monitoring, reporting and mitigation requirements required by EPA, as well as implement the mitigation listed in the SSA report. WSDOT would be responsible for any monitoring that is required beyond the duration of the Project construction. Accordingly, FHWA and FTA find that the Safe Drinking Water Act has been addressed to the level necessary to complete the NEPA analysis.

Endangered Species Act

The Endangered Species Act (ESA) of 1973, codified at 16 U.S.C. 1531 et seq., provides a means to conserve the ecosystems that threatened and endangered species depend on and a program to conserve such species. The ESA requires federal agencies to ensure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence or direct mortality of any listed species or result in destruction or adverse modification to the critical habitat of listed species. This requirement is fulfilled by consultation and review of the proposed actions, and related mitigation, with the appropriate agency responsible for the conservation of the affected species.

The ESA consultation requirements were implemented for the Project by FHWA and FTA through formal consultation with NMFS and informal consultation with USFWS, and were formally initiated with submittal of the project's Biological Assessment (BA) on June 24, 2010. During preparation of the BA, regular coordination meetings occurred between NMFS, FHWA, FHWA, FTA, WDFW,ODFW and Project biologists, including briefing sessions, telephone updates, and periodic review drafts.

ESA-related approval of the project has been obtained through NMFS's issuance of a Biological Opinion (BO) and USFWS's issuance of a concurrence letter for threatened and endangered species and their habitats that may be affected by the project. NMFS has required in the BO that certain terms and conditions be met in order to provide clearance of the project. The BO requires that impact pile driving would be completed during an in-water work window between September 15 and April 15. There are limits on the sound levels of impact pile driving, as described in the BO. The BO was issued on January 19, 2011. The concurrence letter was issued by USFWS on August 27, 2010.

As described in Chapter 3.16 of the FEIS, the BO and USFWS's concurrence letter determined that permanent and temporary project actions may affect and would likely adversely affect listed Chinook (*Oncorhynchus tshawytscha*), sockeye (*Oncorhynchus nerka*), coho (*O. kisutch*), chum (*O. keta*), steelhead (*O. mykiss*), eulachon (*Thaleichthys pacificus*), and Steller sea lion (*Eumetopias jubatus*) and their designated critical habitat, if present. It was determined that the project may affect but would not likely adversely affect bull trout (*Salvelinus confluentus*), green sturgeon (*Acipenser medirostris*), and killer whale (*Orcinus orca*), and their designated critical habitat, if present. The Project would have no effect on listed plant species, as no listed plant

species occur within the Project footprint. The Project would not jeopardize the existence of any listed species, nor adversely modify or destroy critical habitat.

As required by Section 7 of the ESA, NMFS also provided an incidental "take" statement with the BO. The incidental take statement describes reasonable and prudent measures NFMS considers necessary or appropriate to minimize the impact of incidental take associated with the Project. The take statement sets forth nondiscretionary terms and conditions, including reporting requirements, that the Project must comply with to carry out these reasonable and prudent measures. Accordingly, FHWA and FTA find that, with the incorporation of the terms and conditions contained in the BO into this ROD and with the issuance of a USFWS concurrence letter, the Section 7 consultation requirements have been met and ESA has been satisfactorily addressed.

NMFS proposed critical habitat for eulachon (*Thaleichtys pacificus*) on January 5, 2011. NMFS designated critical habitat, including portions of the project's action area, on October 20, 2011. The final rule takes effect on December 19, 2011. After coordination with NMFS, FHWA and FTA sent correspondence to NMFS on November 28, 2011 stating their intention to reinitiate consultation to address potential project effects on eulachon critical habitat.

Additionally, on January 10, 2011, NMFS proposed critical habitat for lower Columbia River coho salmon (*O. kisutch*). Proposed critical habitat is within the project's action area. FHWA and FTA will consider the status of lower Columbia River coho salmon's critical habitat at the time of the reinitiation of the eulachon critical habitat to determine the proper course of action for evaluating project effects to this habitat including whether its critical habitat has been formally designated

Magnuson-Stevens Fisheries Conservation Management Act

The Magnuson-Stevens Act (MSFCMA) affords protection to Essential Fish Habitat (EFH), which may include streams, lakes, ponds, wetlands, other currently viable water bodies, and most of the habitat historically accessible to salmon. Under MSFCMA, NMFS is required to provide EFH conservation and enhancement recommendations to federal and state agencies for actions that adversely affect EFH. Of the fish species present in the project area, EFH applies only to Chinook and coho.

Consultation with NMFS on effects to EFH has been completed in conjunction with the Section 7 ESA consultation. NMFS determined that adverse effects to EFH from the Project would occur. Their findings are addressed in conjunction with the BO issued on January 19, 2011. Conservation recommendations were included in the NMFS findings. Accordingly, FHWA and FTA find that the MSFCMA has been satisfactorily addressed.

Marine Mammal Protection Act

The Marine Mammal Protection Act, found at 16 U.S.C. 31 et seq., was enacted in 1972 and prohibits, with certain exceptions, the "take" of marine mammals in United States waters and by United States citizens on the high seas and the importation of marine mammals and marine mammal products into the United States.

Steller sea lions and California sea lions (*Zalophus californianus*) transit through the main project area during the spring on their way to and from feeding at Bonneville Dam, and harbor

seals (*Phoca vitulina*) also occur sporadically in low numbers in the main project area. These marine mammals are protected under the Marine Mammal Protection Act.

As described in Chapter 3.16 of the FEIS, the Project may include a "take" of sea lions and seals, in the form of incidental harassment during construction activity, including pile driving and pile removal. A Letter of Authorization (LOA) for long-term, incidental harassment of sea lions and seals is being sought from NMFS under the Marine Mammal Protection Act. The LOA entails a federal rule-making process and is addressing impacts on the environment through a separate NEPA process by NMFS between fall 2011 and spring 2012, with the LOA anticipated to be issued by fall 2012. Therefore, FHWA and FTA find that the Project has addressed the Marine Mammal Protection Act to the level necessary to complete the NEPA analysis.

Fish and Wildlife Coordination Act

16 U.S.C. §§ 661-667 requires consultation with USFWS and state fish and wildlife agencies whenever waters of the channel of a body of water are modified by a federal department or agency, with a view to the conservation of wildlife resources. Through the Section 404 permit process, USACE will coordinate with USFWS and other state and federal fish and wildlife agencies regarding impacts to fish and wildlife resources. The Project will apply for a Section 404 permit, and as such, FHWA and FTA find that the Fish and Wildlife Coordination Act has been addressed to the level necessary to complete the NEPA analysis.

Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act

The Migratory Bird Treaty Act, (16 U.S.C. §§ 703-712), prohibits the taking, killing, or possessing of native migratory birds, and the Bald and Golden Eagle Protection Act (16 U.S.C. § 668) prohibits the taking or possessing of bald or golden eagles. Bald eagles (*Haliaeetus leucocephalus*) use the Columbia River and environs to forage for fish and waterfowl, but no nesting or breeding sites are known within 1.0 mile of the project. Peregrine falcons (*Falco peregrinus*), protected under the Migratory Bird Treaty Act, are known to be present in the project area, and utilize the existing I-5 bridge structures year-round.

As described in Chapter 3.16 of the FEIS, construction activities would impact migratory birds, including peregrine falcons, through noise impacts and removal or degradation of habitat. Mitigation measures to address these impacts include impact avoidance and impact minimization. Impact avoidance would be addressed by timing vegetation removal to occur outside of nesting seasons for migratory birds. Demolition of existing structures would likely be scheduled outside of nesting seasons for native migratory birds to avoid direct impacts to active nests. If demolition activity is to occur during nesting season, and migratory bird nesting is deemed likely, exclusionary measures or other methods to prevent active nesting will be implemented. In very rare cases, removal of active nests may occur through permits held by USDA/Wildlife Services. Accordingly, with the mitigation described in the FEIS, FHWA and FTA find that the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Acts have been addressed to the level necessary to complete the NEPA analysis.

Resource Conservation and Recovery Act

There are several provisions in federal law and regulations that regulate the generation, transportation, treatment, storage, and disposal of hazardous waste. These laws include the Resource Conservation and Recovery Act, found at 42 U.S.C. 82 et seq. As described in Section

3.18 of the FEIS, a database search identified 238 hazardous materials sites, in or near the main project area, that may possibly contain recognized environmental conditions (RECs) and 117 historic sites with RECs. Extensive mitigation procedures are described in Section 3.18.5 to ensure the safe handling of all hazardous materials encountered by, and/or used by, the Project. Accordingly, FHWA and FTA find that upon completion of all listed mitigation, the Resource Conservation and Recovery Act has been addressed to the level necessary to complete the NEPA analysis.

Section 106 of the National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NRHP) of 1966, as amended, (16 U.S.C. 470), requires that federal agencies identify and assess the effects of federally assisted undertakings on historic resources, archaeological sites, and traditional cultural properties, and to consult with interested parties to find acceptable ways to avoid or mitigate adverse effects.

The Project has consulted with Washington State Department of Archaeology and Historic Preservation (DAHP) and the Oregon State Historic Preservation Office (SHPO) because the project has the potential to affect properties that are listed or eligible for NRHP listing. Consultations and coordination also involved interested parties, including the Chinook Tribe, City of Portland, City of Vancouver, Confederated Tribes and Bands of the Yakama Nation, Confederated Tribes of the Colville Reservation, Confederated Tribes of the Grand Ronde Community of Oregon, Confederated Tribes of the Siletz Reservation, Confederated Tribes of the Umatilla Reservation, Confederated Tribes of Warm Springs Reservation of Oregon, Cowlitz Indian Tribe, National Park Service (NPS), Nez Perce Tribe of Idaho, Spokane Tribe of the Spokane Reservation, Nisqually Indian Tribe, USACE, and Washington Department of Natural Resources.

Three NRHP-listed or eligible historic resources will be adversely affected by the SA. These properties are listed below:

- Pier 99 Building
- Historic I-5 Bridge
- Vancouver National Historic Reserve

A total of 32 archaeological NRHP-listed or eligible sites, as listed in the FEIS, will be affected by the SA.

Adverse effects to the above historic and archaeological resources are addressed by the Section 106 Memorandum of Agreement (MOA) dated September 8, 2011. This MOA was developed in consultation with the SHPOs, tribes, and consulting parties. This ROD requires compliance with the MOA stipulations. Stipulations include programmatic language to address areas that will not be accessible for archaeological investigation until the right-of-way is acquired. The MOA stipulations include: general requirements and standards, mitigation for adverse effects, the significant archaeological resources in the project area and principles on how to complete archaeological investigations, dispute resolution, and duration, amendment and termination agreements for the MOA. Appendix G to this ROD includes a fully executed copy the Memorandum of Agreement. Based on the foregoing, FHWA and FTA find that the requirements under the National Historic Preservation Act (16 U.S.C. 470) and, in particular, Section 106 consultation, for this project have been fulfilled.

Section 4(f) of the Department of Transportation Act

Section 4(f) of the Department of Transportation (DOT) Act of 1966, 49 U.S.C. 303(c) requires that use of land from a significant publicly owned park, recreation area, wildlife and waterfowl refuge, or historic site, be approved only if: (1) There is no feasible and prudent alternative to the use of the land; and (2) The project includes all possible planning to minimize harm to the site. A Section 4(f) evaluation must be prepared that describes the affected resources, discusses the direct impacts and the proximity impacts that would substantially impair the use of these resources, and identifies and evaluates alternatives that avoid such impacts and measures to minimize or mitigate for unavoidable adverse effects. FHWA and FTA included Section 4(f) evaluations in Chapter 5 of the FEIS. These evaluations have been provided to the Department of the Interior which has found that appropriate consultation with state and local agencies has occurred. The Department of the Interior stated on August 11, 2011 that it concurs with the Section 4(f) evaluation and FHWA and FTA's determination. 23 U.S.C. 138 mirrors this requirement.

FTA and FHWA conclude that the Project cannot avoid the use of Section 4(f) properties. All prudent and feasible alternatives would use Section 4(f) resources. More than 70 project components were considered in the alternative development and screening process. Many of these components were dismissed because they did not meet the Purpose and Need of the project or their cost or environmental impacts were higher than the alternatives advanced, as summarized in Section 2.7 of the FEIS.

As discussed in Section 5.4 of the FEIS, there are no prudent and feasible alternatives that would avoid all Section 4(f) resources. Therefore it was necessary to analyze which alternative would cause the least overall harm. Section 5.5 of the FEIS identifies the reasonable measures to minimize harm or mitigate for adverse impacts. This is an important consideration in determining the least harm alternative. In addition, regulations in 23 CFR 774.3(c) provide the following direction for determining the alternative that would cause the least overall harm:

(c) If the analysis … concludes that there is no feasible and prudent avoidance alternative, then the Administration may approve only the alternative that:

(1) Causes the least overall harm in light of the statute's preservation purpose. The least overall harm is determined by balancing the following factors:

i. The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property);

ii. The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection;

iii. The relative significance of each Section 4(f) property;

iv. The views of the official(s) with jurisdiction over each Section 4(f) property;

v. The degree to which each alternative meets the purpose and need for the project;

vi. After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f); and

vii. Substantial differences in costs among the alternatives

Exhibit E summarizes how each of the alternatives performs relative to each of these seven factors. These summaries draw from the information and analysis in the Section 4(f) evaluation included in the FEIS. The locations of that information are cited in the first column of the exhibit. The last column of the exhibit indicates which alternative has the least harm for each factor. Based on the consideration and balancing of all factors, FTA and FHWA determine that there is no feasible and prudent alternative to the use of the Section 4(f) resources under the SA; the project includes all possible planning to minimize harm to the Section 4(f) resources; the Project includes all reasonable and prudent measures to minimize or mitigate for unavoidable adverse effects to the Section 4(f) resources; and the least overall harm alternative is the SA and that all of the provisions of Section 4(f) have been satisfactorily addressed.

Exhibit E

Summary of Least Overall Harm Analysis

Factors	SA	Alternatives 2 and 3 Replacement Crossing	Alternatives 4 and 5 Supplemental Crossing	Least Harm
Ability to mitigate impacts to Section 4(f) properties, including any benefits to properties	There is limited ability to mitigate impacts to the 1917 I-5 bridge or Pier 99 building as neither can be avoided and both would be very difficult to relocate. Mitigation will include recording, interpretation and a plan to market these resources for reuse. Mitigation for the VNHR[b] is substantial and beneficial, including a new curation and museum facility, protections during construction to avoid vibration impacts, new vegetative screening and new sound walls to reduce existing and future highway noise. Parkland replacement, new transit access, landscaping and parking will mitigate Marshall Park impacts. The SA with mitigation will add recreational value to three resources: parkland replacement, improved access, bridge removal and other improvements will mitigate Waterfront Park; reconstruction, realignment and new surfacing will mitigate Waterfront Trail; reconstruction and new surfacing will mitigate Marine Drive Trail. Impacts to other resources are *de minimis*.	Same as SA	Ability to mitigate impacts to most resources is similar to the SA, although there is lower ability to mitigate impacts or improve recreational value for Waterfront Park and Waterfront Renaissance Trail because the existing bridge will still pass very low over these properties and without the removal of the existing bridges, there will be no surplus property to convert to new parkland. These alternatives would use four historic Section 4(f) uses that would be avoided or would have *de minimis* impact with the SA. The impacts would be relatively low (partial acquisitions) but there would be little ability to mitigate those impacts.	All alternatives have similar ability to mitigate impacts, but the SA and Alternatives 2 and 3 would provide the most benefit to Section 4(f) resources.

Factors	SA	Alternatives 2 and 3 Replacement Crossing	Alternatives 4 and 5 Supplemental Crossing	Least Harm
Severity of remaining harm after mitigation	After mitigation, severity would be high for the I-5 northbound bridge, moderate for Pier 99, and low for the Waterfront Renaissance Trail, Waterfront Park, Marshall Park, and VNHR including the Barracks Post Hospital and Officer's Row. All other impacts would be *de minimis*.	Similar to the SA but in addition would have remaining low impact to Old Apple Tree Park (within VNHR) and three additional historic Section 4(f) resources (see below).	Similar to the SA except: the severity would be lower (moderate) for the I-5 northbound bridge, and higher (but still low) for Clark College Recreational Fields and Marshall Park. These alternatives also would use four additional historic Section 4(f) resources that are not used by the SA (resources described below). After mitigation the remaining harm to these historic resources would be low but not *de minimis*.	All alternatives have generally equivalent severity of impacts after mitigation.
Relative significance of each Section 4(f) property	All of the alternatives affect the same Section 4(f) properties of highest significance, including the VNHR (national significance) and the 1917 I-5 northbound bridge (regional significance). Affected trails have local and regional significance; other affected historic and park resources are less significant.	Similar to the SA except that it would use three additional historic Section 4(f) properties, including two residences on McLoughlin and one on 31st Street. These 20th-century single-family residences are not highly significant properties.	Similar to the SA except that they would use four additional historic Section 4(f) properties, including two residences on McLoughlin, one on 31st Street and one on K Street. These 20th-century single-family residences are not highly significant properties. These alternatives would also avoid the use of the Waterfront Trail (which would be used/reconstructed by the other alternatives) but would use the Clark College Recreational Fields (a Section 4(f) parks property not used by the SA). Both of these properties have local recreational significance.	Relative significance of Section 4(f) properties is similar for all alternatives.

Factors	SA	Alternatives 2 and 3 Replacement Crossing	Alternatives 4 and 5 Supplemental Crossing	Least Harm
Views of officials with jurisdiction	NPS and City of Vancouver view the VNHR as the most significant historic resource affected by the project. The Department of the Interior expressed support for a range of alternatives as long as the project included all feasible measures to reduce impacts to VNHR, and provided adequate mitigation for unavoidable impacts. Input from these agencies and DAHP resulted in design refinements that reduced impacts to VNHR compared to Alternatives 2 and 3 and led to the intensive VNHR mitigation (museum and curation facility). SHPO and DAHP did not express a preference for a particular alternative but support the mitigation. City of Vancouver, City of Portland, Vancouver Public Schools and Clark College all provided input leading to impact reduction and current mitigation for the parkland resources that they manage. These agencies concurred with findings of *de minimis* impacts.	Same as SA	Similar to the SA, except that NPS indicated a preference for the removal of existing bridge towers that intrude on views from the VNHR. The lift towers are removed with all alternatives except Alternatives 4 and 5. City of Vancouver preferred the SA over these alternatives, in part because the SA provides better connectivity to the waterfront including park and trail.	Officials with jurisdiction who expressed a preference generally prefer the SA (modified version of Alternative 3).
Degree to which alternative meets the Purpose and Need for the project	SA provides the highest overall ability to meet the Purpose and Need. It is the most effective at addressing growing travel demand and congestion; impaired freight movement; safety and vulnerability to incidents; and seismic vulnerability. It is generally equal in meeting the bicycle and pedestrian need. It is better than Alternatives 2 and 4 at meeting the public transportation need but provides less frequent LRT service than Alternative 5.	Alternative 3 is similar to the SA. Alternative 2 is also similar to the SA except that it is less effective at meeting the transit need because BRT would not perform as well as LRT.	Alternatives 4 and 5 are less effective than the other alternatives at meeting several stated needs including congestion; impaired freight movement; highway safety and vulnerability to incidents (more crashes and related congestion); and seismic vulnerability (would retrofit old bridges rather than replace them). Alternative 4 is also less effective at meeting the transit need than the SA, Alternative 3 or Alternative 5 because BRT would not perform as well as LRT.	SA best meets Purpose and Need. Alternatives 4 and 5 are considerably less effective at meeting Purpose and Need.
Magnitude of impacts to non-Section 4(f) resources after mitigation	More right-of-way acquisition and displacement of existing uses adjacent to I-5 (9–17 more commercial uses and 4–12 more residences) compared to the other alternatives. These will be mitigated with relocation assistance, full market value acquisition, and support for redevelopment.	Similar to SA but with lower right-of-way acquisition impacts (9–17 fewer commercial uses and 5–12 fewer residences).	Compared to SA, lower right-of-way acquisition impacts (8–16 fewer commercial uses and 4–12 fewer residences). These alternatives would have higher adverse impacts even after mitigation to river navigation and safety; local traffic circulation and movement; air quality; local connectivity; and natural resources. They are also less consistent with local and regional plans.	Magnitude of non-Section 4(f) impacts is lowest for Alternatives 2 and 3 (fewer acquisitions) and generally equivalent for the SA and Alternatives 4 and 5.

Factors	SA	Alternatives 2 and 3 Replacement Crossing	Alternatives 4 and 5 Supplemental Crossing	Least Harm
Substantial cost difference among alternatives	Capital costs differ by less than 10% among the alternatives.	Capital costs differ by less than 10% among the alternatives.	Alternative 4 has the lowest estimated capital cost but costs differ by less than 10% among the alternatives. Alternatives 4 and 5 have the highest estimated annual operations and maintenance costs.	There is no substantial cost difference among alternatives.

Section 6(f) of the Land and Water Conservation Fund Act

Section 6(f) of the federal Land and Water Conservation Fund Act (LWCF) prohibits the conversion of property (primarily parks and recreation facilities) acquired or developed with grant funds provided through the act, unless replacement land of at least equivalent monetary and recreational value is identified, approved, and acquired.

Under Section 203 (k)(2) of Public Law 91-485, as amended [40 U.S.C. 484 (k)(2)], the NPS administers the Federal Lands to Parks (FLP) Program, which conveys surplus federal land to local jurisdictions for public parks and recreation purposes, usually at no cost. Requirements of the FLP Program are similar to those of Section 6(f) of the LWCF Act. If property conveyed under this program is acquired for a non-park or recreation use, this conversion must be approved by NPS, and replacement property of equal market value and reasonable equivalent recreational utility must be identified and acquired.

An analysis of Section 6(f) and FLP requirements has been completed in Chapter 3.7, Parks and Recreation, of the FEIS. Both East Delta Park and the Burnt Bridge Creek Multi-use Trail have received LWCF grant funds. However, FTA and FHWA find that no parks protected by Section 6(f) of the LWCF Act will be converted to permanent non-park use. A portion of Marshall Community Park, Old Apple Tree Park, the Burnt Bridge Creek Multi-use Trail, and a portion of East Delta Park are protected by the FLP Program. Marshall Community Park is the only park protected by FLP provisions that would have property permanently acquired by the project. A replacement parcel for the FLP land used by the Project has been identified, located near the acquired FLP land, and it has been determined to have equal or greater recreational utility.

Based on the analysis in the FEIS and Section 4(f) Evaluation, FTA and FHWA find that the requirements of the LWCF Act have been met to the level necessary to complete the NEPA analysis.

FAA Notice of Proposed Construction or Alteration

There are two airports that could be impacted by the Project: Portland International Airport and Pearson Field. Impacts to these airports and their respective airspace were described in the FEIS. FTA and FHWA find that the Project will not impact Portland International Airport and will have a beneficial impact to Pearson Field by removing the lift towers, on the existing bridges, which intrude on its protected airspace.

Additionally, the Federal Aviation Administration will perform an airspace review of the proposed development when the Project submits the Notice of Construction, Alteration,

Activation and Deactivation of Airports application pursuant to 14 CFR Parts 77 and 157. The FAA will determine the effects of the proposed project upon the safe and efficient utilization of navigable airspace. Once FAA has determined that the SA is consistent with existing airspace utilization and procedures, the Project will meet the appropriate requirement. Accordingly, FTA and FHWA find that the standards and requirements of 14 CFR Parts 77 and 157 have been addressed to the level necessary to complete the NEPA analysis.

Americans with Disabilities Act / Architectural Barriers Act

29 U.S.C. 35.150 addresses a number of issues relating to accessibility, including access to the workplace (title I), and access to places of public accommodation and commercial facilities (title III). The Act states that "Each service, program, or activity must be operated so that, when viewed in its entirety, it is readily accessible to and usable by individuals with disabilities, unless it would result in a fundamental alteration in the nature of a service, program, or activity or in undue financial and administrative burdens." The Architectural Barriers Act further specifies accessibility standards. The Project, as illustrated in the preliminary designs has been designed to meet all ADA requirements and the final design will produce further construction details. In addition, the light rail vehicles to be purchased as part of the project will all be low-floor vehicles that provide accessibility for disabled individuals. Accordingly, FTA and FHWA find that the standards and requirements of the ADA and ABA have been met.

Farmland Protection Policy

Pursuant to 7 U.S.C. 658, federal agencies are required to account for the adverse effects of their programs on the preservation of farmland. FTA and FHWA find that no farmland will be taken as a direct impact of the Project. The states of Oregon and Washington have land use planning regulations, including urban growth boundaries, to protect farmland. As addressed in the FEIS Section 3.4 Land Use and Economics, the Project is unlikely to induce sprawl, and will likely promote compact urban development. Metro, as the responsible agency for the urban growth boundary around the Metro area, has a long history of effective growth management, and the City of Portland has a sophisticated zoning code with provisions for focusing growth where desired and encouraging compact mixed-use development around transit facilities. The land use regulations in the City of Vancouver and Clark County also have robust growth management policies and regulations. Accordingly, FHWA and FTA find that the Project does not substantially increase the potential for loss of farmland in the Portland-Vancouver region and that the Project is compatible with state and local programs to protect farmland, and that no further action by Project is needed concerning this Act.

Noise Control Act of 1972 / Quiet Communities Act

There are several federal regulations concerning protection from noise impacts. These regulations include the Noise Control Act of 1972 (and as amended by the Quiet Communities Act of 1978, see 42 U.S.C. 4901 - 4918) which requires federal agencies to develop programs to promote an environment free of noise that jeopardizes public health or welfare and that agencies comply with state and local noise ordinances. FTA has developed criteria, most recently documented in the Transit Noise and Vibration Impact Assessment Manual (May 2006), which addresses Title 42. FHWA has developed criteria, codified in 23 CFR Part 772 Procedures for Abatement of Highway Traffic Noise and Construction Noise and has produced a guidance document, Highway Traffic Noise: Analysis and Abatement Guidance, January 2011. The FEIS

Section 3.10 Noise and Vibration, identifies the noise and vibration analysis methods, impacts and mitigation, including compliance with local noise regulations as applicable (Ruby Junction Maintenance Facility in Gresham). With the completion of the mitigation measures cited in this document, FTA and FHWA find that the noise and vibration requirements of these Acts will be met.

Executive Order 12898 Environmental Justice

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority and Low-Income Populations" (February 11, 1994), provides that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations." The Department of Transportation Order (No. 5680.1) to Address Environmental Justice in Minority Populations and Low-Income Populations requires agencies to (1) explicitly consider human health and environmental effects related to transit projects that may have a disproportionately high and adverse effect on minority and low-income populations; and (2) implement procedures to provide "meaningful opportunities for public involvement" by members of these populations during project planning and development. Specifically, the USDOT Order states, in part:

> *8.b. In making determinations regarding disproportionately high and adverse effects on minority and low-income populations, mitigation and enhancements measures that will be taken and all offsetting benefits to the affected minority and low-income populations may be taken into account, as well as the design and comparative impacts and the relevant number of similar existing system elements in non-minority and non-low-income areas.*
>
> *8.c. The Operating Administrators and other responsible DOT officials will ensure that any of their respective programs, policies or activities that will have a disproportionately high and adverse effect on minority populations or low-income populations will only be carried out if further mitigation measures or alternatives that would avoid or reduce the disproportionately high and adverse effect are not practicable. In determining whether a mitigation measure or an alternative is "practicable," the social, economic (including costs) and environmental effects of avoiding or mitigating the adverse effects will be taken into account.*

As part of the public project planning process through completion of the FEIS, FHWA, FTA and the project’s local partners implemented meaningful outreach efforts to minority and low-income communities to assure their active participation. The outreach efforts are described in the environmental justice analyses included in these environmental documents.

As discussed in FEIS Section 3.5, Neighborhoods and Environmental Justice, adverse impacts such as unmitigated noise impacts, traffic impacts, visual impacts, and displacements will not have a high, adverse, and disproportionate effect on environmental justice populations.

At the Ruby Junction Maintenance Facility, the project identified the potential for disproportional impacts to low-income and minority persons (four of nine residential displacements have minority residents; two of nine are likely low-income, which is slightly lower than the percentage minority and the percentage low-income in the surrounding census tract). When considered with the 59 residential displacements for the project as a whole, the

proportions of minority and low-income displaced residents are similar to or slightly above the levels in the project area, but they are not disproportionately high. In addition, given the Project's commitments to provide compensation and relocation assistance in accordance with federal regulations, these impacts would be minimized, avoiding high and adverse impacts to low-income or minority populations.

Therefore, consistent with the definition established in Executive Order 12898, the Project would not result in high and adverse human health, environmental, social, and/or economic impacts. The Project would provide improved access to transit, reduced travel time, and improved accessibility to employment and services. FEIS Section 3.5, Neighborhoods and Environmental Justice, discusses these determinations. Accordingly, FTA and FHWA find that the project would not have disproportionately high and adverse effects on the minority or low-income populations in the project area, as provided under the USDOT Order on Environmental Justice, particularly in light of the offsetting benefits to minority and low-income populations and that the requirements of Executive Order 12898 have been met.

Executive Order 13175 Consultation and Coordination with Indian Tribe Governments

WSDOT, ODOT, FHWA, and FTA are committed to government-to-government consultation with tribes on projects that may affect tribal rights and resources. The CRC tribal consultation process is designed to encourage early and continued feedback from, and involvement by, tribes potentially affected by the Project, and to ensure that their input will be incorporated into the decision-making process. Although tribal consultation and government-to-government tribal consultation is being undertaken as a distinct outreach effort, tribal involvement is also occurring during agency coordination and public involvement.

During the NEPA process, consultation and coordination was conducted with the following Indian Tribe Governments: the Chinook Tribe, Confederated Tribes and Bands of the Yakama Nation, Confederated Tribes of the Colville Reservation, Confederated Tribes of the Grand Ronde Community of Oregon, Confederated Tribes of the Siletz Reservation, Confederated Tribes of the Umatilla Reservation, Confederated Tribes of Warm Springs Reservation of Oregon, Cowlitz Indian Tribe, Nez Perce Tribe of Idaho, Spokane Tribe of the Spokane Reservation, and Nisqually Indian Tribe. Meetings with the Washington State Department of Archaeology and Historic Preservation (DAHP) and the Oregon State Historic Preservation Office and tribes were held. Comments received were responded to and incorporated into the FEIS. Accordingly, FHWA and FTA conclude that Executive Order 13175 has been satisfactorily addressed by the Project.

Executive Order 12372 Intergovernmental Review of Federal Programs

This Executive Order directs federal agencies to consult with and solicit comments from state and local governments whose jurisdictions would be affected by a federal action. During the course of the alternatives analysis, the DEIS, selection of the locally preferred alternative, completion of preliminary design, and the FEIS, state and local agencies were directly involved in the project. Technical, executive and steering committees comprised of state and local staff, executives and elected/appointed officials were coordinated with during each Project phase. Documentation of these efforts is included in Chapter 2 and Appendix A of the FEIS.

Accordingly, FTA and FHWA find that the requirements of Executive Order 12372 have been met by the Project.

Executive Order 11988 Floodplains

Executive Order 11988 requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. Portions of the I-5 highway and supporting infrastructure currently exist within the Columbia River's floodplain and within the river itself, including portions of the highway system that will experience an increased footprint as a result of the Project. A flood-rise analysis will be conducted during final project design, when the bridge design is further advanced, to precisely calculate the impact that the Project, including the Project's piers in the water, would have on flood elevation, in accordance with local and state regulations and Executive Order 11988.

Given available information, it is reasonable to assume that formal hydraulic analysis will conclude that there would be no flood-rise, or if analysis indicates that any rise would occur, it would be very small. Should flood-rise be projected or the existing floodplain be otherwise negatively impacted, additional mitigation would be identified to negate the impacts. Specific mitigation measures, if necessary, would be determined in coordination with federal, state, and local regulatory agencies, but could include balanced cut and fill, map revisions, and/or bridge pier volume reduction or design revision, and will be ultimately determined at the project final design stage.

The FHWA and FTA find that for the Columbia River floodplain and floodway, the Project has considered design and alignment alternatives and has minimized impacts. In addition, the Project will conduct a formal flood-rise analysis, and if necessary, develop specific mitigation measures if the floodplain would be negatively impacted by the project. As such, FWHA and FTA find that the Project has satisfactorily addressed and will comply with Executive Order 11988.

Public Opportunity to Comment

Since its inception in 2005, the Project has implemented a comprehensive public outreach program to ensure the community's values are integrated into project development. The outreach program is multi-faceted because of the variety of interested stakeholders: those that live in the two states within neighborhoods close to the project and those that use the I-5 corridor.

The Project used many different communication methods to reach affected and interested parties in ways that are useful to the receiver of the information. Since October 2005, project staff has had more than 27,000 public outreach contacts at about 900 events. These interactions and project outreach efforts have been targeted to reach neighborhoods; low-income, minority and limited English proficiency populations; and special interest groups.

The Project presented information regularly at neighborhood association, community organization and business meetings and participates in community fairs and festivals. The Project has convened nine community advisory groups over the last 5 years. These groups have gathered interested parties in the following topic areas: freight, bicycle and pedestrian, community and environmental justice, Marine Drive interchange, transit alignment and design in Washington, transit design in Oregon, urban design and overall project development. The Project has sponsored more than 25 open houses, design workshops and question and answer sessions to

help inform the public and gather opinions at major decision points, including defining the purpose and need, screening initial components, analyzing preliminary alternatives, selecting the EIS alternatives and choosing the locally preferred alternative. Since the selection of the locally preferred alternative, these events have focused on design details like the number of lanes, interchange designs, and transit alignments and station locations.

Comments received at events and by phone, email or mail are recorded and considered by project staff. Summaries or copies of these comments were provided to advisory leadership groups like the Task Force, through June 2008, and the Project Sponsors Council, since June 2008, for their reference in making project recommendations. Major themes of comments received from 2005 through 2009 primarily included preferences for taking action to solve the problems in a short time frame, specific river crossing options (including alternate highways), and transit modes. Other comment themes included the location of I-5 improvements for this project; the number of lanes and size of the highway facilities; the need for improved bicycle and pedestrian facilities, including the size or length of the facilities; project aesthetics; project cost; tolling; impacts to low-income and minority communities; concerns about environmental effects, including changes in air quality; the project's contribution to land use changes and climate change; community impacts during construction of the project, and others.

Comments Received on the Final EIS and Responses

Issuance of a FEIS does not require a formal comment period under NEPA regulations, however, FHWA's Technical Advisory T 6640.8A, *Guidance for Preparing and Processing Environmental and Section 4(f) Documents*, calls for new substantive comments received on a FEIS to be responded to in the Record of Decision. This section summarizes the more common, substantive comments received on the FEIS and provides responses. Each of the substantive comment letters, comment forms and emails received, with specific responses, is included in Appendix E. The Project received 134 submittals with substantive comments pertaining to the FEIS. Public notification of availability of the FEIS included the following:

- Letter sent to all property owners whose property was identified in the FEIS as being potentially impacted by the Project
- Postcard or email sent to all who commented on the DEIS
- Postcard sent to all mailing addresses within the Bridge Influence Area and on the Project mailing list
- Email sent to all people on the Project eUpdate list
- Email sent to all Oregon and Washington state legislators and federal representatives
- Press release sent to local media, and briefed media reporters at event
- Project website announcement
- Legal notices in the Columbian, Oregonian, Federal Register and SEPA
- Four drop-in information sessions held within the Project area

The FEIS was distributed to agencies, tribes, libraries and community centers. A copy of the Executive Summary (which included a DVD of the complete FEIS and technical reports) was distributed to current and former members of project advisory groups, community organizations and anyone who requested a copy. The FEIS was also available online at the Project website, www.ColumbiaRiverCrossing.org.

The comments were reviewed and common themes were identified. The common themes of the comments and FHWA and FTA's summary responses are presented below.

Purpose and Need

Approximately 15 reviewers submitted comments related to the Project's stated purpose and need. Comments included questions about the origins of the purpose and need, and assertions that the purpose and need was too narrowly written or that it should have included needs other than transportation.

Response:

The FEIS includes information addressing most of the comments received on the purpose and need. Chapter 1 includes the purpose and need itself as well as a description of how the purpose and need was developed (Section 1.2). Section 3.1 includes a detailed discussion of many of the transportation needs that the Project is intended to address.

The initial information for the Project purpose and need originated with a 2001 study by the I-5 Portland/Vancouver Transportation and Trade Partnership Task Force, consisting of governor appointed community members, business representatives, and elected officials. The Task Force studied the transportation problems, and developed a plan to improve transportation, in the I-5 corridor between the I-405 interchange in Portland and the I-205 interchange north of Vancouver. The Task Force adopted a Final Strategic Plan on June 18, 2002. This plan included several proposals and recommendations for further study. The Project was one of the proposals recommended by this plan, and those studies established the foundation for the Project's purpose and need. These recommendations led to additional focused study, further refinement of the transportation needs, the development of a problem statement, and the development of the purpose and need based on the analysis of issues in the corridor, public input and coordination with partner agencies. Public input was sought throughout the 2001 study and again as the Project initiated scoping in 2005 and began to refine the understanding of the problems and develop the purpose and need. The identified needs cover a range of transportation issues including: travel demand and congestion; impaired freight movement; limited public transportation operation, connectivity and reliability; safety and vulnerability to incidents; substandard bicycle and pedestrian facilities; and seismic vulnerability.

The purpose and need was written so as to allow consideration of a wide range of potential solutions to meet the various needs. For example, the test of whether or not certain types of components could meet the need related to "congestion" allowed flexibility in how that need could be met by any given alternative. Components could either "increase vehicular capacity or decrease vehicular demand" to meet the congestion and mobility related need, as described on page 2-72 of the FEIS. This allowed consideration of a wide variety of highway, transit and non-construction ideas.

Some commenters felt that the purpose and need should have been expanded beyond transportation needs to include other public policy objectives, such as sustainability or reducing Greenhouse Gas (GHG) emissions. The cities, region and states have many public policy goals, but that alone does not warrant them being included in the stated purpose and need for this proposed action. A wide variety of public goals, including community, environmental and financial goals, were reflected in the Project Vision and Values, and included in the evaluation criteria used to screen and analyze alternatives (as discussed in Chapter 2 of the FEIS). While the

Project does aim to promote these non-transportation objectives, they are not among the fundamental needs for the Project.

Range of Alternatives

Approximately 36 reviewers submitted comments related to the Project's development of alternatives. Comments included assertions that the range of alternatives in the EIS was too narrow, and that the EIS inappropriately excluded some good alternatives from detailed evaluation in the EIS, including new river crossing locations, bypasses and other proposals. Some comments also suggested modifications to the LPA or other alternatives.

Response:

The Project is intended to address specified needs in an approximately 5-mile section of the I-5 corridor surrounding the river crossing. However, the Project considered a wide range of potential solutions, including new river crossing locations outside the immediate I-5 corridor, as discussed in Chapter 2 of the FEIS. Many options, components and alternatives were considered during the early stages of the Project study as well as in studies that preceded the Project.

The early screening of alternatives found that I-5 bypass options with new crossing locations, outside the I-5 vicinity, could not adequately address the Project's purpose and need. They could provide some transportation benefits, but they failed to address some of the basic elements of the purpose and need, as discussed in Chapter 2 of the FEIS. In addition, alternatives that did not involve any highway improvements could not adequately address critical elements of the Project's stated needs. Alternatives that could not adequately address the purpose and need were not carried forward into the DEIS.

A number of project ideas were proposed by citizens and others after the DEIS was issued. Many of these were very similar to ideas that had been previously considered, or were suggested refinements to the existing alternatives. Ideas that could not meet the purpose and need were considered but not advanced. A number of refinements suggested by various stakeholders were able to meet the purpose and need as well as provide other benefits. Through public and agency coordination, several of these were incorporated into the proposal, as discussed in Chapter 2 of the FEIS.

GHG/Climate Change

Approximately 16 reviewers submitted comments related to climate change, greenhouse gas (GHG) emissions, and energy use. Comments mostly asserted that the Project would likely increase rather than decrease GHG emissions.

Response:

Section 3.19.10 of the FEIS discusses climate change and the Project's expected impact on GHG emissions. The EIS acknowledges that global GHG emissions are expected to continue to increase for the foreseeable future and that the cumulative (global) impact of GHG emissions is effecting climate change. The analysis found that the LPA would have lower emissions than the No-Build Alternative, but all 2030 scenarios evaluated would have higher emissions than occur today because the regional population is forecast to grow by a million people over the next 20 years. The FEIS provides data showing that without the Project there would be substantially longer daily durations of congestion on I-5, including more stop and go traffic and traffic moving

at less than 20 mph (pages 3-32 to 3-34). Higher traffic speeds (in the range of about 40 to 60 mph), compared to stop and go traffic, can substantially increase fuel efficiency which in turn decreases GHG emissions. The Project would also contribute to reducing GHG emissions by shifting some auto trips to transit and by tolling the highway crossing which discourages some trips and reduces overall vehicle miles travelled (VMT). Most of the comments received on GHG emissions are addressed in the responses to comments made on the DEIS (see pages 6-19 through 6-20 of the FEIS) and in Section 3.19.10 of the FEIS.

Environmental Review Process

The Project team received approximately 52 comments on the environmental review process, ranging from questions on how comments received on the DEIS had been addressed, expressing concern with a perceived lack of a substantive change in the analysis since the conclusion of the DEIS comment period, and some suggestions that a supplemental DEIS should have been prepared to evaluate project changes before the FEIS was released. A small number of comments requested an extension in the FEIS review period while others suggested that the Project be rapidly advanced to construction.

Response:

Building from the 2002 I-5 Transportation and Trade Partnership Final Report, which recommended the Project and other improvements to address I-5 transportation needs, the National Environmental Policy Act (NEPA) process for the Project began in 2005. NEPA requires complex projects like the Project to study multiple alternatives and their effects to the community and environment, and to involve the public and other stakeholders in the process. Following the publication of the DEIS on May 2, 2008, the Project actively solicited public and stakeholder feedback on the DEIS during a 60-day comment period. Public comment was submitted via several methods, including email, postal mail, and public meetings that included two open houses. During this time, the Project received over 1,600 written and oral public comments. The Project prepared written responses to all comments received during the DEIS comment period. Individual comments and responses can be found in the FEIS, Appendix P.

The FEIS contains analyses of environmental and community effects and describes how the Locally Preferred Alternative (a replacement bridge with light rail) would address the Project purpose and need. A variety of actions were taken in response to agency and public comments, including refinements to alternatives, additional analysis, and corrections that are included in the FEIS. Refinements to the Locally Preferred Alternative are described in Chapter 2 of the FEIS. Changes in analysis, including updated modeling and inputs, are described in each section of Chapter 3 of the FEIS.

The design refinements made after the DEIS were considered and reviewed by FTA and FHWA, consistent with 40 CFR 1502.9(c)(1) and 23 CFR 771.130(a). See discussion on page 2-86 and Appendix O of the FEIS. While there were refinements to alternatives and new information in the FEIS, none of the changes made after the DEIS would result in new significant environmental impacts that were not previously evaluated in the DEIS. There was no need to prepare a supplemental draft EIS prior to issuing the Final EIS.

The FEIS was issued on September 23, 2011. All relevant comments received through the week of October 24, 2011, were treated as comments on the FEIS and were responded to in this ROD (responses to individual comments received during this review period are included in Appendix

E of this document). Instructions for commenting were provided on page vi of the FEIS and on the project website.

FHWA, FTA, and the co-lead agencies have determined that the NEPA process has been followed appropriately with opportunities for public and agency input and thorough evaluation of all relevant subjects. Transportation modeling of the Project is based on the best reliable information, uses adopted models and follows current practices. Compliance with other regulations has also been demonstrated appropriately for this stage of design and conclusion of the NEPA process. The lead agencies have considered requests for additional time to comment on the FEIS and determined an extension is not warranted.

Water Quality Treatment

The Project team received approximately 17 comments on ecosystems issues, several of which related to water quality. These comments included concerns that the FEIS fails to provide sufficient detail on the effect stormwater from the Project area will have on the overall quality of receiving waters.

Response:

Section 3.14 of the FEIS discusses the proposed treatment of stormwater and the impacts said stormwater will have on receiving water bodies. Additional technical information is provided in the Water Quality and Hydrology (WQH) Technical Report and Appendix A (Stormwater Management Memorandum) of the technical report.

The FEIS and its technical reports and appendices discuss the use of water quality treatment scenarios and provide results of models tailored to roadway projects and its runoff. The use of the WSDOT-FHWA model was summarized on page 3-341 of the FEIS, was discussed in further detail on page 4-6 of the WQH Technical Report and was refined in the Technical Report Errata. As summarized on pages 3-341 and 3-342 of the FEIS, LPA Option A would increase total impervious surfaces by 42 acres, from approximately 239 acres currently. Of these additional 42 acres, only 28 acres are anticipated to be pollutant generating, with the remaining 14 acres being non-pollutant-generating surfaces such as bike/pedestrian and LRT facilities. Although an increase of 11 percent of pollutant generating impervious surface might occur, a decrease of untreated stormwater runoff would also occur, from approximately 219 acres to zero.

The analysis using the available models and the discussion associated with stormwater treatment best management practices (BMPs) in Appendix A of the WQH Technical Report, show that overall pollutant loading will decrease and that stormwater treatment will treat at least 80 to 90 percent of annual runoff. The Project has committed to increasing that treatment rate wherever practicable, and is required in Washington to treat 91 percent of annual runoff (page 4 of Appendix A of WQH Technical Report). The BMPs proposed for stormwater treatment are designed specifically for treatment of roadway runoff and are effective in reducing sediments and particulate and dissolved metals (Page 10 in Appendix A of WQH Technical Report). Where high concentration of oils and greases are anticipated, oil control pretreatment may also be required for proper operation of stormwater BMPs (Page 10 Appendix A of WQH Technical Report).

The stormwater BMPs were chosen based on a multi-agency effort associated with both states' Departments of Transportation and relevant regulatory agencies. As Municipal Separate Storm Sewer System (MS4) permit holders, ODOT and WSDOT work with DEQ and Ecology,

respectively, to determine appropriate treatment measures to ensure water quality in receiving waters. Thus, through use of the BMPs identified, the Project team is confident that proper treatment for pollutants was adequately addressed in the FEIS. Final design of stormwater facilities cannot occur until near-final design of the project elements flowing into the facilities is complete.

As noted, further discussion with DEQ and Ecology will occur during permitting to address any concerns on water quality.

In addition, immediately prior to release of the FEIS for public review, the Regional Sediment Evaluation Team concurred with findings of a sediment analysis in the North Portland Harbor and the Columbia River. The sediment analysis found no contaminants above Sediment Evaluation Framework screening levels, with the majority of sediment constituents below reporting levels. See Appendix G of the Hazardous Materials Technical Report for the results of this analysis.

Biological Opinion

As mentioned above, the Project team received approximately 17 comments on ecosystems, several of which related to the Project's biological opinion (BO). Comments were made stating that the reinitiation of Endangered Species Act (ESA) consultation should be immediately performed for the recent designation of critical habitat for eulachon; and that the FEIS fails to provide adequate data of effects on listed fish species and other native aquatic organisms.

Response:

NMFS proposed critical habitat for eulachon (*Thaleichtys pacificus*) on January 5, 2011. NMFS designated critical habitat, including portions of the project's action area, on October 20, 2011. The final rule takes effect on December 19, 2011. After coordination with NMFS, FHWA and FTA sent correspondence to NMFS on November 28, 2011 stating their intention to reinitiate consultation to address potential project effects on eulachon critical habitat.

Additionally, on January 10, 2011, NMFS proposed critical habitat for lower Columbia River coho salmon (*O. kisutch*). Proposed critical habitat is within the project's action area. FHWA and FTA will consider the status of lower Columbia River coho salmon's critical habitat at the time of the reinitiation of the eulachon critical habitat to determine the proper course of action for evaluating project effects to this habitat including whether its critical habitat has been formally designated.

The Project team has reviewed the critical habitat listing for eulachon and is investigating similarities between eulachon and salmon/steelhead critical habitat elements. At this time, it is believed that the Project may affect critical habitat for eulachon, but to the same extent as it affects salmon/steelhead critical habitat. That is, no adverse modification or destruction of critical habitat is anticipated. After the consultation is complete on the eulachon's critical habitat, a re-evaluation will be prepared to see if the FEIS needs to be supplemented.

The information related to the discussion of cumulative impacts and FHWA/FTA's responsibilities under NEPA and ESA are addressed adequately in the project documents. NEPA documents must "provide full and fair discussion of significant environmental impacts." Section 3.19 of the FEIS discusses these impacts. In addition, Sections 4 and 5 of the Ecosystems Technical Report provide over 140 pages of discussion on long-term and short-term effects on

aquatic and terrestrial locations. In this discussion and the findings of effects, it is noted that some effects will occur. These are quantified in area or in time. Some effects may be relatively large, as in the case of potential hydroacoustic effects from impact driving of temporary piles; while others may be relatively small, as in the case of use of work barges when compared to the extent of the entire lower Columbia River.

Through the NEPA process, and in coordination with ODFW, WDFW, NMFS, and USFWS, the Project team identified several potential impacts to native fish, particularly listed salmon, steelhead, and eulachon. The major impact to these fish was identified as the impact installation of temporary work piles. Along with this activity, shading, hydraulic shadowing, barge use, stormwater treatment, among others, were also identified and analyzed. In the context of ESA, FHWA and FTA prepared a BA with a finding of effect for each of these project elements. Items from the BA were then used to assess effects for the FEIS for salmon, steelhead, eulachon and other species in the context of NEPA. That full analysis is found in the Ecosystems Technical Report. FHWA and FTA have therefore met its requirements under ESA and NEPA.

Human Health

Most comments received relating to human health fall under other categories, such as air quality or construction, and are discussed elsewhere in this section. However, reviewers also submitted comments relating more generally to human health, mostly asserting that the Project should include a human health assessment and that the Project would have unacceptable adverse effects on human health.

Response:

While EISs rarely include a chapter titled “human health,” impacts to human health have been integral to NEPA analysis for the past 40 years, and they are integrated throughout the Project NEPA analysis as well. The DEIS and FEIS analyses of impacts to air quality, noise, electromagnetic fields, water quality, groundwater, and hazardous materials are based on comparing the Project’s impacts to standards that have been established to protect public health. In addition, the analysis of impacts to land use, neighborhoods, biking, walking, traffic, safety, security, parks and recreation, public services, and visual resources also relate to public health. See the Chapter 3 analyses of impacts to the health-related issues listed above.

Modeling conducted for the FEIS and DEIS indicate that air emissions from I-5 traffic would be significantly lower by 2030 than they are today, and would be well below established regulatory standards designed to protect human health (see Section 3.10 of the FEIS). Noise impacts from I-5 traffic, with the mitigation proposed for the Project, would also be substantially lower than today. Noise from light rail operation can be mitigated to be below FTA’s noise impact criteria as well (see Section 3.11 of the FEIS).

The FEIS discusses how the Project would affect the surrounding urban form in ways that would increase opportunities for physical activity, including: improved bicycle and pedestrian facilities crossing the river; improved connections between existing and new bicycle and pedestrian paths and across I-5; the light rail transit extension and transit stations that support increased pedestrian-oriented development; improved sidewalks in Vancouver; and new pedestrian and bicycle connections crossing I-5. The Project would also greatly improve highway safety (reducing crashes) and would reduce daily hours of congestion on I-5 compared to the No-Build

Alternative and provide improved transit service, decreasing the amount of time travelers spend in cars, thus further allowing for physical activity.

A common concern raised regarding human health was in regard to air quality impacts from construction, especially the effect of construction vehicle and equipment emissions. The research reviewed for the FEIS analysis, and the analysis of the Project itself, indicate that violations of air quality standards during construction are unlikely to occur. However, while construction may not violate emission standards, it will result in increased emissions. To address this, the Project has committed to specific mitigation measures that will be implemented during construction, as outlined in the ROD and FEIS, to further reduce emissions associated with construction activities.

Land Use and Sprawl

The Project team received approximately 45 comments on issues related to induced travel across the I-5 Bridge and related changes to development patterns. Several of these comments expressed concerns that the Project will encourage sprawl. The comments asserted that the Project likely would induce residential development at the urban edge in Clark County.

Response:

As described in Chapter 3 (Section 3.4) of the FEIS, and in the Indirect Effects Technical Report, highway capacity improvements and access improvements can induce development in suburban and rural areas that were not previously served, or were greatly underserved, by highway access. The FEIS provides an overview of the induced growth effects that could be expected from the Project. A review of national research on induced growth indicates that there are six factors that tend to be associated with highway projects that induce sprawl. These are discussed in the Indirect Effects Technical Report and FEIS. Based on a comparison of those national research findings to the Project's travel demand modeling, Metro's 2001 and 2010 land use/transportation modeling, and a review of Clark County, City of Vancouver, City of Portland and Metro land use planning and growth management regulations, the FEIS concludes that the likelihood of substantial induced sprawl from the Project is very low. In fact, the Project, because of its location in an already urbanized area, the inclusion of new tolls that manage demand, the inclusion of new light rail, and the active regulation of growth management in the region, will likely reinforce the region's goals of concentrating development in regional centers, reinforcing existing corridors, and promoting transit and pedestrian friendly development and development patterns.

In October 2008, the Project convened a panel of national experts to review the travel demand model methodology and conclusions, including an evaluation of the induced growth analysis. The panel unanimously concluded that the Project's methods and conclusions were valid and reasonable. In 2010, Metro ran the MetroScope model (an integrated land use and transportation model) to forecast growth associated with transportation improvements of a tolled, 12-lane river crossing with light rail to Clark College. The model showed a minor effect on employment location and housing demand, including a slight shift of demand from more distant parts of the region toward areas nearer the I-5, compared to the No-Build Alternative.

For more discussion regarding potential indirect land use changes as a result of the Project, including the likely land use changes associated with the introduction of light rail, please see Chapter 3 (Section 3.4) of the FEIS.

Hayden Island

The Project team received approximately 20 comments on the topics of property acquisitions and 40 related to project construction, most of which related to how these aspects of the Project would impact Hayden Island residents and the mitigation for these impacts. Commenters expressed concern about the number of displacements on the Island, the loss of business services (such as the Safeway grocery) which would result from these displacements, and the redevelopment potential of the Island following construction. Commenters also expressed concern about the construction period impacts on the Island, and asked for many different mitigating measures.

Response:

The Project attempts to avoid the displacement of businesses, although it is not always possible. The Project will continue to look for ways in which impacts can be avoided and minimized. The displacement of Safeway is documented in the FEIS. Mitigation for this impact is governed by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended). The Project will encourage Safeway to relocate on Hayden Island, but cannot require them to relocate to any specific location. The eventual relocation or closure of the store will be a business decision by Safeway. There is a large Target store currently under development on the Island, and it will provide limited groceries and a pharmacy, helping minimize, but not eliminate, the impact of a potential Safeway closure.

Many of the displaced businesses on the island are restaurants. The Project is working with business owners on relocation plans, although it is likely that there will be a period during which the number of restaurants is greatly reduced. Other displaced business services include banking, a car wash, and a hotel. The Project is making a multi-million dollar investment in Island infrastructure, including a light rail station and a considerable improvement to the local street and pedestrian network. Investments such as these have been shown to attract new development. Guided by the Hayden Island Plan, the new development could be more tailored to the needs of Island residents and less-so to the needs to shoppers from Washington.

The Project has identified the likely impacts from construction on the island and has worked closely with the community to develop a mitigation plan for these impacts. In many cases, the commenters were asking for items that the Project has already committed to. Other mitigation measures have been suggested and will be considered as the construction plans are further developed. Some requests for mitigation measures are outside of the authority of the Project (such as constructing a new park on the Island's north shore or establishing a new police precinct and station). See also the discussion of construction effects in Human Health and Air Quality sections, above.

Environmental Justice / Hayden Island Manufactured Home Community

The Project team received approximately 56 comments on environmental justice and neighborhoods, including comments expressing concern about construction-period impacts to residents of the Hayden Island Manufactured Home Community. Comments assert that there are environmental justice (EJ) households in this community or that the entire community should be treated as an EJ population. Detailed comments were provided regarding the impacts of construction and the possible mitigation measures for such. Some comments suggested that the

construction period noise, dust, and other impacts represent a disproportionately high impact to the residents of the manufactured home community.

Response:

The Project study area is large and demographically diverse. The Project has recognized that there are not only individual households in the study area that are minority or low-income, but that there are also areas which have comparatively high rates of these same EJ households. Refer to pages 3-135 through 3-137 of the FEIS where there is detailed information about which neighborhoods have the highest percentages of minority and low-income households. The Project fully recognizes the presence of EJ households and the areas where the percentage of these households are comparatively high. The Project also recognizes that there are EJ households within the Hayden Island Manufactured Home Community. The implementing federal and state guidelines on EJ have and will guide the Project's consideration of, outreach to, and mitigation of impacts for EJ households, where ever they are located.

The demographic data presented for the Hayden Island Neighborhood in Chapter 3 (Section 3.5) of the DEIS was taken from the 2000 U.S. Census and was adjusted to the neighborhood boundaries. The U.S. Census estimated a total of 2,071 residents on the Island, which is in-line with the population estimate of 2,155 residents conducted in 2007 by the City of Portland for the Hayden Island Plan process. In an effort to more accurately reflect the Island population, the FEIS assessment is based on updated data from the 2010 Census, the American Community Survey, and a project-specific survey of potentially displaced households. Updated population and demographic information can be found in Chapter 3 (Section 3.5) of the FEIS. The displacement survey (which focused on the most directly impacted households) was undertaken in response to assertions that the Census data misrepresented the affected community. The U.S. Census data indicate that, as a whole, the Hayden Island neighborhood has a lower proportion of minority and low income households than in the City of Portland, Multnomah County, or in the Project study area. Hayden Island ranks near the lower end of the spectrum in the rate of both minority and low-income households when compared with all other neighborhoods in the study area.

There would be no displacement of households within the Hayden Island Manufactured Home Community and thus the Project did not conduct a separate demographic survey, using instead the US census data and other sources. The impacts to these households will result from construction-related air, noise, and traffic impacts. The Project has committed to a variety of construction-related mitigation measures that will minimize impacts to residents within the Project area, including the Hayden Island Manufactured Home Community. Please see pages 3-262 through 3-263 of the FEIS for a discussion of measures that will be implemented during construction to control dust and limit exhaust emissions from demolition and construction activities. See Sections 5.2 and 6.3 of the Noise and Vibration Technical Report (an Appendix of the FEIS) for a discussion of measures to minimize noise impacts to residents, including a commitment to build a temporary noise wall at the Thunderbird Hotel site if this site is chosen as a staging or casting site; and Section 3.1 of the FEIS for a discussion of mitigation measures for constructed-related traffic impacts. Please also see Human Health, above.

Traffic and Traffic Projections

The Project received approximately 41 comments related to traffic and traffic projections. Many comments stated that the Project will not adequately reduce congestion. Commenters said that the vehicle travel time savings are not sufficient to justify the cost of the Project. Other commenters said that nothing can be done to reduce congestion, so why spend the money on the project. Some commenters believed that the Project was not doing enough to address congestion and that more lanes should be built. Some commenters stated that light rail would do nothing to reduce vehicle traffic and therefore it should not be included in the Project.

Another theme was that predicted 2030 traffic volumes used by the Project were too high. Commenters also asserted that the Project's estimate of future induced traffic was too low (these are addressed under Land Use and Sprawl above).

Response:

By 2030, the region's population is expected to increase by one million people. This increase will result in more people needing to travel between home, work, school, recreation, etc. In 2005, 135,000 vehicles crossed the Columbia River on the Interstate Bridge, which led to 4-6 hours of congestion each weekday. By 2030, 184,000 vehicles are predicted to cross the river, which would lead to 15 hours of daily congestion if no action is taken.

Traffic forecasts reported in the DEIS and used to inform decisions on a locally preferred alternative were derived from adopted regional employment and population forecasts and state-of-the-art modeling and evaluation conducted by Metro, RTC and the Project team, and reviewed by all project sponsor agencies as well as FTA and FHWA. In addition, an independent panel of traffic modeling experts was convened in October 2008 to review the modeling methods and findings. These experts concluded that the Project's approach to estimating future travel demand was reasonable and that it relied on accepted practices employed in metropolitan regions throughout the country. These findings are summarized in the "Columbia River Crossing Travel Demand Model Review Report" (November 25, 2008). This independent review confirmed the approach Project modeling used to address multiple variables that can affect travel demand, including gasoline prices, tolling, travel demand measures and induced development.

Congestion occurs when vehicle demand is greater than a transportation system's capacity. It results in slower speeds and increased travel times. The Project defines congestion as vehicles traveling less than 30 mph. The Project uses information gathered from Metro's nationally-recognized travel demand models to determine the Project's effect on congestion. These models predict trip frequency, types or modes of transportation, destination, and time of day of travel. Transportation planners use these models to analyze the effects of such factors as increased population and employment, transportation improvements, and new developments on the transportation system.

Based on the Metro model's past ability to predict transportation effects, the Project is confident in the data received from Metro and uses it to determine what impact the Project will have on congestion. The improvements proposed by the Project to the highway and seven project interchanges will help better accommodate increased future vehicle traffic. New auxiliary lanes and longer on/off ramps will allow safer and more efficient merging and weaving to enter or exit the freeway. Narrow lanes and shoulders will be widened to current standards. Shoulders will be

added where they are currently missing. All of these changes will improve the flow of traffic in the bottleneck area of the Interstate Bridge.

Cost Estimating / Financing / Funding

More than 57 comments were made on the cost estimating, financing, or funding of the Project. Many of the comments asserted that project costs were inaccurate and that the actual costs are likely to be higher. Many commenters suggested that the benefits of the Project were not worth the high cost. Comments were also made that the Project does not have committed funding. Some commenters believe that the Project will not be able to be built in its entirety and will require phasing of construction.

Response:

The projected costs to construct the Project are presented in Chapter 4 of the FEIS, and are estimated in year-of-expenditure dollars to account for inflation. The estimated cost to construct this project would be covered by a variety of funding sources, as described in Chapter 4. While a portion of this cost is expected to be covered by local and state funds, federal funds and toll revenues are expected to cover the majority of the capital costs.

Cost estimates for the Project were developed using the Cost Estimate Validation Process® (CEVP), a WSDOT methodology to help deliver major projects. CEVP® expresses schedule and cost as ranges rather than as single numbers, which accounts for risk factors that might otherwise cause costs to balloon over time. Accounting for these risks increases the accuracy and overall reliability of the cost estimates.

It is common practice on large public proposals to secure the funds to construct the project after the NEPA phase. In fact, to commit certain types of funds prior to issuing the ROD would violate federal law, as some types of federal funding commitments are considered “federal actions” and therefore cannot be made until after the ROD is issued.

Regarding phasing, the FEIS evaluates the full impacts of the entire Project and evaluates how those impacts may differ if several elements were to be constructed at some later date. This is described on page 2-86 of the FEIS and the likely impacts are discussed in each section of Chapter 3 and in Chapter 5. As the FEIS notes (page 2-4), a wide range of possible cash flow scenarios and construction phasing scenarios are possible. Phasing a project can change the timing of impacts but does not generally make a significant difference in the character or magnitude of impacts. Prior to the ROD, it is not possible to know how much funding the project will receive or when it will receive it and therefore it is also not possible to know how it will be phased. Following the ROD, as commitments to funding are secured and the timing of funding becomes known, the effect of phasing or sequencing can be reviewed to determine if it would change the existing NEPA evaluation of environmental impacts and/or mitigation in a meaningful way. Any changes could be assessed through a NEPA re-evaluation, as appropriate, and a determination would be made at that time if any additional NEPA review would be needed.

Air Quality Construction and Conformity

More than 15 comments were made on the air quality impacts associated with the Project, including comments related to the impacts of construction activities on air quality generally and comments that because the Project construction will exceed five years, it will trigger a requirement under the transportation conformity rule to provide “hot spot” analyses.

Response:

Regarding construction's impacts to air quality generally, Section 3.10 of the FEIS discusses relevant research conducted during the construction of the Dan Ryan Expressway in Chicago. The Dan Ryan project involved construction of a transportation facility with elements very similar to the Project, in an urban environment and through a wide range of meteorological conditions. The study spanned several years and included many samples covering many different types of construction equipment, and types and levels of construction activity. Through several years of construction, the monitoring did not detect any elevated concentrations that were directly related to the project. The Project is expected to have half the volumes of the Dan Ryan project. This information from the Dan Ryan project monitoring research supports the conclusions that the Project construction is not expected to cause any air quality violations.

Regarding transportation conformity rules, under 40 CFR 93.123 (c)(5), CO, PM10, and PM2.5, hot-spot analyses for construction are required only if the construction phase lasts five years or more at any individual site. Although the Project construction will last more than 5 years, project construction activities at any one site are not expected to last more than 5 years. Thus, a CO hot-spot analysis was not conducted. Since the area is in attainment for PM10 and PM2.5, a PM hot-spot analysis was not required. Should it become evident at any time during final design and construction planning that construction will occur continually at a given site for more than five years, then the Project would conduct appropriate hot-spot analysis at that time.

As described in Section 3.10 of the FEIS, construction mitigation will focus on controlling dust and exhaust emissions from demolition and construction activities and on minimizing traffic congestion. The Project will comply with relevant regulations, and as described in Section 3.10, require additional requirements on project contractors above and beyond what is required by regulation. The Project will also explore other technologies and methods that could be used to further reduce emissions from construction equipment and vehicles.

Navigational Impacts

US Coast Guard expressed concerns that the proposed vertical clearance of 95 feet above 0.0 Columbia River Datum would impede some commercial and recreational vessel movements and potentially impact some maritime businesses.

Response:

The project conducted a series of studies and stakeholder outreach efforts to determine the appropriate navigation clearance for the proposed bridges. Many factors were considered in these studies. In addition to vessel height, the safe and efficient operation of aviation (Pearson Field), highway, light rail, and the multi-use path (bicycle and pedestrian) were considered. Effects on aviation were evaluated using federal regulations for the safe, efficient use and preservation of navigable airspace (14 CFR Part 77). These FAA regulations are applicable to Portland International Airport (PDX) and nearby Pearson Field. Objects violating the requirements of the Part 77 regulations may be deemed a "hazard to aviation". Three navigation channels (Primary Channel, Barge Channel, and Alternate Barge Channel) are currently designated by the United States Army Corps of Engineers (USACE) and permitted by the United States Coast Guard (USCG). The past and future uses of these three channels were also evaluated.

The primary road surface constraints considered in the evaluation also included concerns related to safe and functional operation of the highway, transit, and multi-use path facilities. All facilities must be able to make required connections to interchanges, surface streets, and stations and to do so in a safe manner in accordance with standards of practice.

CRC conducted studies of current river usage and validated these studies through stakeholder outreach to determine what clearances are required by current river users. These efforts included a boat survey to identify the types of vessels that use the Columbia River at the project location, their frequency of usage, and required navigation clearance. Additionally, a series of telephone and/or face-to-face interviews were conducted with river users to validate and update the information contained in the boat survey. Along with these efforts, the USCG held a preliminary hearing on the Columbia River Crossing to solicit comments from river users.

The information gathered from the above-mentioned studies and stakeholder outreach was considered in conjunction with the operational statutes for nearby Pearson Field and with requirements, as noted in the project purpose and need statement, for safe and efficient operation of the proposed highway, light rail, and multi-use path facilities. Taking all of these considerations into account, it was determined that a 95-foot vertical clearance will allow all but three known and infrequent river users to navigate beneath the bridge at all times of year. Some of the users could partially disassemble so they could pass beneath a 95-foot vertical clearance. A higher bridge would include additional hazards to aviation, operational and safety impacts to highway, operational, safety and maintenance impacts to transit, and increased environmental impacts, including increased impacts to Section 4(f) properties that the U.S. Department of Transportation has a duty to minimize.

In evaluating crossing level and span length with respect to aviation, navigation, and project geometry shows that the mid-level structure would beneficially affect aviation and navigation. While the mid-level bridge does not favor any single interest, it benefits all interests in an equitable fashion with respect to the aviation and navigation constraints and the project’s purpose and need.

Agency and Tribal Coordination

Agency coordination has played a significant role throughout the Project’s NEPA process, from defining the Purpose and Need to development of the DEIS and FEIS. Because the project is located in two states, cities, and counties, it requires coordination and outreach with numerous federal, state, and local agencies. In addition, the project is composed of three major structural components: a bridge, transit and highway. Thus, various agencies have a wide range of expertise and jurisdictional authority.

The Project team has, and continues to, communicate with regulatory agencies throughout the NEPA process and to identify permits and approvals needed for construction.

The Project team works extensively with regulatory agencies and local jurisdictions, structured into three designated agency groups: the Interstate Collaborative Environmental Process group (InterCEP), Cooperating Agencies, and Participating Agencies. The InterCEP group is composed of federal and state regulatory agencies that will likely have permit or approval authority over certain components of this project. Cooperating Agencies are federal agencies invited to participate in the development of the EIS and may use the document to help their permit or

approval decision making. The Participating Agency group, as defined in the transportation bill reauthorization SAFETEA-LU, includes representatives from a variety of local and state agencies and tribal governments with an interest in the project.

WSDOT, ODOT, FHWA, and FTA are committed to government-to-government consultation with tribes on projects that may affect tribal rights and resources. The Project's tribal consultation process is designed to encourage early and continued feedback from, and involvement by, tribes potentially affected by the Project, and to ensure that their input will be incorporated into the decision-making process. Although tribal consultation and government-to-government tribal consultation is being undertaken as a distinct outreach effort, tribal involvement is also occurring during agency coordination and public involvement.

APPENDIX A

PROJECT MITIGATION COMMITMENTS

Appendix A

PROJECT MITIGATION COMMITMENTS

Introduction

This attachment summarizes the mitigation commitments made by the Federal Highway Administration (FHWA), Federal Transit Administration (FTA) and the Project Sponsors for the Columbia River Crossing Project (Project). These measures are more fully described in Chapters 3 and Appendix L of the Final Environmental Impact Statement (FEIS) and in other supporting documents including the Biological Opinion, the Final 4(f) Evaluation, and the Memorandum of Agreement regarding Historic, Cultural, and Archaeological Resources, and those more detailed descriptions remain in effect.

The Record of Decision (ROD) incorporates these mitigation measures into the definition of the project, and the project sponsors shall implement them, provide funding for their implementation, or ensure that other agencies fund and implement them (although this does not alleviate the project sponsors' overall responsibility for implementation). The project sponsors are prohibited from withdrawing or substantially changing any of the mitigation commitments identified in the ROD for the Project without FHWA's and FTA's written approval. In addition, FHWA and FTA must review and approve any change to the Project that may involve new or changed environmental or community impacts not yet considered in the existing environmental record, in accordance with 23 CFR Part 771.

In addition to outlining the specific mitigation measures required under this ROD, this list is provided here to facilitate the monitoring of the implementation and effectiveness of the mitigation measures and to give a sense of the nature of the mitigation actions and associated impacts. If mitigation measures identified in the FEIS and the other supporting documents identified above are not included in this summary, those mitigation measures are incorporated and included herein.

Mitigation is listed in two categories: long-term, those associated with Project operation, and short-term, those associated with Project construction. Wherever it is feasible and appropriate, mitigation measures that consist of construction methods or practices or involve constructed elements of Project facilities or improvements shall be incorporated in the Project design and specification documents and included as contractual obligations within construction contracts.

In January 2011, the Council on Environmental Quality issued guidance on "establishing, implementing, and monitoring mitigation commitments" in environmental review and decision documents. The guidance reminds agencies that they should document mitigation commitments, and, where warranted, monitor the effectiveness of mitigation. Where appropriate and practicable, the mitigation matrix below describes performance standards or expected results of the mitigation measures. Where it is not practicable to specify performance standards or to define monitoring plans at this level of design, then they will be developed, as needed, during final design and construction. Where warranted, the Project will define the mitigation performance that contractors will be required to achieve on each of the relevant elements of construction-related mitigation listed in the matrix below, and will require contractors to document and report their compliance with these measures, where practicable. The project sponsors will establish and conduct a mitigation monitoring program during final design, construction, and startup with the goals of 1) helping the project sponsors fulfill the commitments set forth in the environmental documents, and 2) giving FHWA and FTA a means of overseeing the effectiveness of and compliance with its mitigation requirements. The monitoring program will consist of four activities:

- Maintaining a current list or database (or matrix) of mitigation commitments by the project sponsors.
- Tracking the status of implementation of the mitigation measures by the project sponsors.
- Reporting on the effectiveness of the mitigation measures implemented.
- Submitting quarterly reports to FTA and FHWA during the construction phase and then thereafter on a regular basis as determined by FTA and FHWA.

Mitigation Matrix

Impact from the SA	Mitigation or Compensation	Regulatory Driver
3.1 Transportation		
Loss of on-street parking	When on-street parking is removed, City of Vancouver policy calls for replacement parking to be provided within 750 feet. Given the constrained nature of the downtown area, it is very challenging to identify areas for replacement parking that would not displace existing buildings (businesses and residences), travel lanes, parks, or other current uses. Mitigating circumstances include: the existing parking supply is greatly underutilized; and the introduction of light rail will enable greater use of transit and reduce the need for parking space. Mitigation measures include: working with City to attain compliance or partial exemption from City parking policy. Coordination between C-TRAN and the City will occur to consider shared parking use agreements that will allow some use of the new park and ride facilities. An agreement would require prior concurrence from FTA for incidental use. The project team has worked with property owners and the City of Vancouver to identify the following mitigations for the loss of on-street parking: 1. The addition of 50 stalls within the SR 14 westbound to southbound loop 2. The acquisition of the existing city parking lot south of Smith Tower, which will be repurposed to serve Smith Tower residents	NEPA, Local Ordinances
Transit Safety and Security		
New mode could increase vehicle crashes	Safety measures will be designed into the project, based on AASHTO standards, including: *Physical barriers such as medians, fencing, landscaping, or chain and bollard (short, vertical posts) to help channel automobiles, pedestrians, and bicyclists *Signage, tactile pavers, audio warnings, and pavement markings at track crossings to alert individuals they are approaching tracks	NEPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	*Active treatments such as flashing lights, bells, and illuminated and audible warning devices in traffic signals *The creation of inviting, well-lighted platforms and station areas *Maintaining clear sight lines for oncoming trains *Implementing a public safety education campaign before the start of service	
Bicycle safety could be impacted due to new tracks and stations	The project will provide bicycle access to station locations by perpendicular access streets within each city's bicycle network. Station areas include bicycle facilities, which could include secure storage areas. The Project will coordinate with each governing jurisdiction to determine the appropriate number of bicycle storage facilities per station. Local jurisdictions should consider access to light rail stations as bicycle system plans are updated.	NEPA
Pedestrian safety could be impacted due to new tracks and stations	The Project will provide pedestrian access to stations by establishing "through-walking areas" adjacent to the planned station locations. Through-walking areas are clear pathways free of street furniture or other impediments. The project will maintain these areas at approximately 7 to 8 feet in width in busy pedestrian locations such as downtown and 6 feet in width in areas with lower levels of pedestrian traffic.	NEPA
Potential security issues at new stations	Strategies on crime prevention will be implemented through station environmental design (CPTED) and the use of police, private security patrols, and security cameras as appropriate to make the light rail facilities as safe and secure as possible. TriMet and FTA have existing policies and procedures for operating during a potential catastrophic event and preventing terrorist activities. These policies will be expanded to include the CRC project and C-TRAN. Both TriMet and C-TRAN will maintain a Safety and Security Management Plan. The State Safety Oversight Agency will provide input during final design and provide an oversight function and final sign-off on safety certification prior to revenue service or allowing for the project to go into revenue service. Finally, CRC's light rail design criteria will be used to design platform location and length, pedestrian crossings, and alignment to ensure that the project operates safely.	NEPA, Transit Agency Operating Procedures

Impact from the SA	Mitigation or Compensation	Regulatory Driver
Vancouver Local Street Performance		
*One intersection would not meet operational standards during a.m. peak (two intersections with highway phasing option) *Three intersections would not meet operational standards during p.m. peak	The City of Vancouver and WSDOT, as appropriate, will monitor traffic operations and pursue the following mitigation measures under the SA: *Monitor and adjust ramp meter rates at Fourth Plain Boulevard ramps when these are installed in the future. When queuing from the ramp causes either ramp terminal to fail to meet the operational standard, ramp meter rates should be adjusted. Due consideration, but not equal weight, will be given to the local system to minimize queuing from the ramp meter. Emphasis will be on avoiding significant adverse impacts and traffic operational failures on the freeway system. *Add a third lane westbound on 15th Street between Washington Street and Columbia Street. Adding the third through lane will allow the drop lane at 15th Street and Washington Street to become a left/through lane adding additional capacity to the 15th Street corridor. This should be completed at such time as it is necessary to achieve the operational standards along the 15th Street corridor. *Add a southbound right turn lane at 15th Street and Columbia Street. This would be completed at such time as it is necessary to achieve the operational standards at the intersection of 15th Street and Columbia Street. *Add a third eastbound left turn at the Mill Plain interchange when needed in the future. The third eastbound left turn lane should be added when eastbound left turn volumes have increased to a level that causes the interchange to fail to meet acceptable operational standards. *Monitor and adjust ramp meter rates at Mill Plain Boulevard on-ramps if/when these are installed in the future. When queuing from the ramp causes either ramp terminal to fail to meet the operational standard, ramp meter rates would be adjusted. Due consideration, but not equal weight, will be given to the local system to minimize queuing from the ramp meter. Emphasis will be on avoiding significant adverse impacts and traffic operational failures on the freeway system.	NEPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
Portland Local Street Performance		
One intersection would not meet operational standards during a.m. peak	TriMet and the City of Portland, as appropriate, will monitor traffic operations and pursue the following measures to mitigate unacceptable operations under the SA: *Going Street and Interstate Avenue: *Optimize light rail transit pre-emption at intersection *Install advanced signal controllers to manage light rail transit pre-emption *Change the westbound right lane into a through/right choice lane to allow traffic to continue westbound	NEPA
Temporary Effects		
Traffic		
Increased congestion on several major traffic facilities in the corridor including I-5 and, potentially, I-205	A variety of activities, ranging from scheduling construction activities to minimize conflicts during peak travel periods to using alternative construction techniques or equipment. Measures will be implemented as appropriate to mitigate the short-term traffic impacts, including: *Work with appropriate jurisdictions to obtain approval of traffic control plans and any necessary agreements. *Develop, during final design, and maintain throughout construction a program of coordination with and outreach to affected business and community interests to provide input on the development and implementation of a transportation management plan. This plan will address a variety of traffic, transit, and alternative mode strategies designed to minimize the transportation impacts of project construction. The plan will also identify detour routes. *As part of the outreach program, establish a telephone complaint and information system to be operated throughout the duration of project construction. *Wherever possible or practical, limit or concentrate work areas to minimize disruptions to vehicular traffic and bus and pedestrian circulation, as well as to business access. *Identify, provide and/or advertise temporary parking locations to replace parking temporarily displaced by construction. *Relocate affected loading zones, property accesses, bus stops, and other specially designated parking and access points before construction begins to allow new traffic patterns to be established.	NEPA
Impacts resulting from traffic relocations or detours		
Full or partial street closures		
Increased truck traffic associated with construction activity		
Intrusion of non-local traffic into residential areas as a result of temporary street closures and traffic detours		
Disruptions to vehicular and pedestrian access to businesses and community services		
High levels of truck traffic are anticipated in connection with earthwork and the delivery of materials at the bridge crossings, freeway mainline segments, and interchanges.		

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	*As appropriate, develop and implement functional and reasonable alternative construction techniques to minimize traffic impacts. *The project will maintain paratransit services for qualifying, mobility-impaired Hayden Island residents and will maintain construction period shuttle service on the island when needed. *The project will implement a TDM program to address traffic impacts during construction.	
Transit		
Temporary loss of on- or off-street parking Transit service delays Relocation or temporary elimination of bus stops Rerouting of bus routes Deterioration in reliability for bus routes using affected roadways and facilities within the corridor	*Mitigation measures will be instituted where bus routes are impacted to provide service that is comparable to non-construction periods. *Working with the two transit agencies, Transportation Management Associations (TMAs), and other organizations, the project will conduct a communications campaign to inform the public about these transit changes. Associated mitigation measures will be developed by the ODOT, WSDOT and transit agencies on both sides of the river. These agencies will communicate the new routing, the potential for more crowded buses and slower travel times, and mitigation measures through TV, radio, email, a Web site, newspapers, and other multimedia instruments to broadcast rider alerts to potentially impacted customers. *The temporary effects of bridge, highway and light rail construction near downtown Vancouver and on Hayden Island will require mitigation for fixed bus routes: *The same communication campaign of rider alerts will be made for both C-TRAN and TriMet buses for all of these mitigation measures. *However, buses currently running south on Broadway will be permanently relocated to either Columbia or C Streets.	NEPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	*The new routing through downtown Vancouver will receive new signs and temporary bus stops. Rider alerts will be made through a communications campaign via the Internet, email, and hard copy postings on buses and at service stops. *Bus routes needing temporary relocation will receive temporary benches and shelters at service stops, depending on the duration of relocation (any relocation greater than 6 months would warrant such treatments) and the number of boardings per day. *During construction, affected transit stops will be temporarily relocated to the nearest possible location on the same transit route without interfering with the construction process. *Temporary sidewalks, pathways and/or detours will be provided to replace any sidewalks and/or trails adjacent to the project that are affected by construction. To help minimize on-street parking impacts, temporary parking will be identified to mitigate the temporary loss of specific on-street parking due to construction. *Mitigated parking losses will include displaced spaces reserved for disabled motorists, spaces identified as critically important to businesses for which no reasonable alternative exists, and others. Business access will be maintained during light rail construction. During previous light rail transit construction projects, TriMet has kept construction disruption to a minimum while maintaining access to businesses and has rapidly responded to concerns and potential issues. Mitigation of short-term impacts to businesses during transit construction can be accomplished through a number of activities.	
Impacts to bike/pedestrian mobility	*Disseminate information about construction, closures and detours. *Temporary enclosures, as appropriate, to provide for the safety of bicyclists and pedestrians traveling beneath structures under construction. *If it is not possible to maintain existing bicycle lanes within the work zone, provide alternate routes.	NEPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
3.2 Aviation and Navigation		
Navigation		
Maximum vertical clearance reduced from 179 feet to 95 feet.	*Complete a boat survey and comply with Section 9 permit terms and conditions. More detailed information will be gathered as part of the Section 9 permit process regarding users that cannot pass through the proposed 95 foot vertical clearance without partial disassembly of their cargo. Mitigation will be evaluated based on the information obtained.	Section 9 Rivers and Harbors Act - USCG
Aviation		
Intrusion into Pearson Field airspace	*Roadway or accent lighting will be designed to limit light or glare that could affect air navigation, and will comply with FAA permit terms and conditions. *The SA will improve safety over the No-Build alternative; therefore, no additional mitigation is necessary.	FAA Form 7460-1 Notice of Proposed Construction or Alteration
Stormwater ponds and structures located within 5,000-foot zone around runways may attract birds	*Stormwater ponds within 5,000-foot zone around runways will include features to discourage birds from utilizing the ponds. *Structures will be designed to minimize locations for birds to roost or nest.	
Temporary Effects		
River navigation impacts due to blockages from construction barges and activities	*At least one river navigation channel will remain open during construction *Restrictions on river travel will be communicated in advance to users of the river, through means determined in coordination with the USCG *Notices will be provided to tug operators, pilots and general public *Additional tugs may be provided where needed to aid in temporary navigation *Conditions of the Section 9 Coast Guard permit will be incorporated into construction contract specifications as applicable	Section 9 Rivers and Harbors Act - USCG
Tall cranes would intrude into Pearson Field airspace	*Obstruction marking and lighting to make construction equipment visible to aircraft. This requirement will be written into the contractor's contract specifications.	FAA Form 7460-1 Notice of Proposed Construction or Alteration
Construction dust or emissions could pose a short-term aviation hazard by reducing visibility	*Construction materials and activities will be managed to minimize dust, glare and exhaust using appropriate technologies available at the time of construction.	FAA Form 7460-1 Notice of Proposed Construction or Alteration

Impact from the SA	Mitigation or Compensation	Regulatory Driver
3.3 Property Acquisitions and Displacements		
Permanent property acquisitions both full and partial	*Purchase property or property right for fair market value as determined through an appraisal.	Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended (Uniform Act)
Permanent easements	*Purchase property or property right for fair market value as determined through an appraisal.	Uniform Act
Displacement of publicly-owned facilities	*Relocation assistance or functional replacement	Uniform Act
Displacement of floating homes in North Portland Harbor	*The floating homes will be purchased at fair market value and the occupants will be provided relocation assistance.	Uniform Act
Displacement of other residences	*Purchase property at fair market value and provide relocation assistance.	Uniform Act
Displacement of 30+ businesses on Hayden Island	*Purchase property at fair market value and provide relocation assistance.	Uniform Act
Displacement of Safeway on Hayden Island	*Purchase property at fair market value and provide relocation assistance.	Uniform Act
Displacement of marine businesses on North Portland Harbor	*Purchase property at fair market value and provide relocation assistance.	Uniform Act
Displacement of other businesses	*Purchase property at fair market value and provide relocation assistance.	Uniform Act
Displacement of shared light industrial and residential uses at Ruby Junction	*Purchase property at fair market and provide relocation assistance. *Possibly assist in search for suitable residential/industrial properties.	Uniform Act
Accesses closed/modified	Where property access is deemed not adequate, evaluate impact under the Uniform Act and compensate if required.	Uniform Act
Temporary Effects		
Blockage of property access during construction	*Provide continued access to properties during construction, maximized to the extent possible.	Uniform Act
Temporary use of property via easements	*Payment to property owners in exchange for the use of their property during construction	Uniform Act
3.4 Land Use and Economic Activity		
No long-term, direct impacts to mitigate.		
Temporary Effects		
Loss of easy access to some businesses during construction; potentially reduced patronage during construction due to reduced access and visibility	Mitigation measures will be provided by the DOTs, TriMet or the construction contractor, and will be specified in a business access mitigation plan, including: *Maintaining physical access to businesses *Providing signs to identify the location of access points to businesses during detours or closures	NEPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	*Contractors will coordinate schedule, pace and order of construction to minimize impact to nearby businesses *Identify local businesses to provide services during construction *The City of Vancouver is planning to establish a Growth and Transportation Efficiency Center. This center will be charged with improving transportation efficiency and will develop and administer a construction communication and mitigation plan, which will be funded by ODOT and WSDOT as mitigation for project impacts. Implementation of programs to help businesses during construction such as: *Business planning assistance *Marketing and retail consulting *Promotions to generate patronage in construction areas	
Effects to freight during construction	*At least one river navigation channel will remain open during construction. *Signs will be posted to encourage commercial freight vehicles not serving destinations in the Portland-Vancouver I-5 corridor to shift from I-5 onto I-205 during construction.	NEPA
3.5 Neighborhoods and Environmental Justice		
Impact of toll collection system (transponders) for low-income travelers and limited-English-proficiency travelers. Also, toll is higher portion of income for low-income drivers, but this is offset by project benefits. Neither of these is a disproportionate high and adverse effect.	A variety of methods will improve low-income drivers' access to transponders used by the electronic tolling system. To mitigate for low-income and minority populations that need to purchase transponders, CRC will: *Provide information about transponders in multiple languages. *Public buildings, including city and county offices, will be used to allow lower income and minority communities to acquire transponders. *Enable people without credit cards or checking accounts to obtain transponders by paying with cash or Electronic Benefit Transfer (EBT) (Quest) cards, which are issued for federal program benefits. WSDOT has coordinated closely with other agencies in Washington State, and the EBT Quest cards can be used for transponder acquisitions. ODOT will work to enable the Oregon Trail Cards to be used for transponder acquisition in Oregon. *Share information with and through other public service providers. *Train social service workers with information about the tolling system.	NEPA, EJ EO

Impact from the SA	Mitigation or Compensation	Regulatory Driver
Displacement of Safeway and bottle return center	*See Property Acquisitions section regarding Safeway displacement* *Provide on-site notice and information regarding the closure of the bottle return center, including directions to other locations on the island that accept returns, and directions to larger, off-island bottle return centers.	Uniform Act
Displacement of service industry jobs due to displacement of businesses	*For loss of service industry jobs, mitigation measures will consist of programs developed prior to construction to promote the use of local workers by utilizing apprenticeship and job training programs. Federal funding rules do not allow for preferential treatment in contracting based on locality. However, the project will provide outreach to local contractors and existing job training programs. A monitoring and evaluation program would be necessary to track these measures through final design, construction, and operation for the facilities to ensure the benefits of promoting participation from contractor minority-owned businesses are realized.	NEPA
Adverse impact to an EJ population due to the Ruby Junction expansion which displaces homes and home-based businesses. This impact would include disproportionate numbers of minority households.	*See Property Acquisitions section*	Uniform Act
Displacement of floating homes in North Portland Harbor	*See Property Acquisitions section*	Uniform Act
Displacement of homes and businesses in Vancouver	*See Property Acquisitions section*	Uniform Act
Increased transit noise on streets with residences	*See Noise section*	NEPA
Increased traffic noise in neighborhoods	*See Noise section*	NEPA
Impacts to Marshall Community Center and Park and Luepke Senior Center	*See Park and Recreation section*	NEPA
Displacement of existing buildings and surface parking within the Clark College Annex area and displacement of some trees and landscaping	*See Public Services section*	NEPA
Impacts to Waterfront Park	*See Parks and Recreation section*	NEPA
Temporary Effects		
Construction effects to neighborhoods and EJ populations	*Provide detours that minimize out-of-direction travel and delays for travelers, and minimize cut-through traffic. *Maintain transit service where possible throughout the construction phase. *Use best management practices to reduce noise, dust, and vehicle emissions during construction.	NEPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	*Use existing or newly acquired right-of-way for construction staging to minimize additional temporary property acquisitions. *Communicate information and obtain feedback about construction activities, impacts and mitigation throughout neighborhoods, including focused outreach to limited-English-proficiency populations. *Restrict haul routes from sensitive locations, such as schools, nursing homes, etc.	
3.6 Public Services and Utilities		
Displace ODOT permit center	Provide compensation under the Uniform Act, as required.	Uniform Act
Displace Clark Public Utilities building near SR 14	Provide compensation under the Uniform Act, as required.	Uniform Act
Displace parking, landscaping, illumination and electronic swing gate at FHWA offices	Provide compensation under the Uniform Act, as required. Mitigation may include, but not be limited to, restriping of parking lot and any other impacts to the subject property.	Uniform Act
Displace Clark College Annex structures, parking and landscaping	*Landscape screening buffer between the new park and ride and the fields, and a pedestrian connection from the parking area to the fields.	Uniform Act
Impacts to intersections on critical access routes	*See Transportation section in this matrix for description of mitigation for intersections*	NEPA
Temporary Effects		
Construction-related congestion on I-5 and local streets	*Provide information regarding construction to service providers. *During construction, as emergency responders monitor response times, if unacceptable delays are occurring due to construction, WSDOT and/or ODOT will meet with emergency service representatives to address construction concerns and develop solutions for better detour route communication. *ODOT and WDSOT will coordinate with emergency service providers to maintain emergency access during construction and through construction zones.	NEPA
Utilities may be affected by construction	*To maintain services, temporary utility relocation and/or staging, and sequencing provisions for the construction of new structures and demolition of the existing structures will occur prior to the start of project construction.	NEPA
Service outages during construction.	*Work closely with utility service providers to reduce the number and extent of service outages during construction or relocation activities and to provide advance notice when such outages might occur.	NEPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
3.7 Parks and Recreation		
Permanent acquisition of 4.2 acres of parks and recreation resources; this includes 1.4 acre from VNHR, 1.0 acre of Clark College recreation fields, 0.6 acre of Marshall Community Park (including 0.1 acre of FLP land), 0.4 acre of Waterfront Park, 0.3 acre of Kiggins Sports Fields, 0.3 acre of Leverich Community Park, and less than 0.1 acre of temporary use at East Delta Park.	The following measures will be employed: *Purchase property at fair-market value per the Uniform Act. *Return 6(f) parkland temporarily occupied during construction to its original condition and recreational utility or better. Make sure nonconforming temporary use lasts less than 180 days (6 months) or a permanent acquisition will occur. Document agreement between FHWA and Portland Parks and Recreation that impact does not constitute a conversion. *Replace Federal Lands to Parks land acquired with adjacent substitution parcel of equivalent or greater market value and recreational utility. *Transfer portion of vacated state right-of-way beneath the existing I-5 bridge landings in Vancouver for City's planned Waterfront Park redevelopment.	Uniform Act; Section 4(f) of USDOT Act; Federal-Lands-to-Parks; Section 4(f) of USDOT Act (23 CFR 774); RCO Manual 7/ Section 4(f) of USDOT Act
Reduction of on- and off-street parking for park and recreation visitors, including parking at Marshall Community Center, Marshall Park, Luepke Senior Center, and Clark College Recreation Fields	The following measures will be employed: *Restripe parking lot to provide for lost spaces or change access points to allow for drop-off areas. *Provide signage indicating parking at Marshall Park is reserved for patrons of the park. *Explore potential incidental use agreement for park and ride.	NEPA; Section 4(f) of USDOT Act (23 CFR 774)
Increased noise levels at some parks	*See Noise section*	NEPA
Removal of trees and vegetation from parks in Vancouver	Implementation of tree replanting and re-vegetation; in most cases trees will be replanted in the same or similar location as the trees removed, where possible.	City of Vancouver Tree Removal permitting process
Changes in views to and from parks	*See Visual section*	NEPA
Displacement of Public Art from Waterfront Park	*See Visual section*	NEPA
Permanent realignment of 550 feet of trails	*Trail access and continuity will be restored and replaced. There will be an overall improvement in trail access and facilities.	NEPA; Section 4(f) of USDOT Act (23 CFR 774)
Temporary Effects		
Temporary property easements for construction access	*Compensate owner and restore site after use.	NEPA
Increased noise, glare, dust, and vibration during construction	*See Visual, Noise and Vibration, and Air Quality sections*	
Construction-related changes to access or traffic operations (closures, detours, and congestion) could delay or deter park users	The following measures will be employed: *Provide adequate signage for any limited or closed access points and detour routes. *Provide resources for a joint public information campaign with parks jurisdictions for some of the longer closures.	

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	*Maintain safety for bicyclists and pedestrians traveling on trails and between facilities with temporary protection. *Additional signage and lighting if deemed necessary by project sponsors based on comments by users.	
Bridge construction activities would temporarily restrict some recreational use of the river	*River users will be provided with a safe passage or detour. The safe passage criteria will be developed through coordination with the Coast Guard.	NEPA
Trees and vegetation in construction area would be removed during construction	Implementation of tree replanting and re-vegetation; protection of trees that are close to construction activities but not displaced (per VMC 20.770.090)	VMC 20.770.090
Traffic rerouting could increase traffic along Columbia Way and Lower River Road. Traffic rerouting could pose an increased risk to bicyclists traveling along these popular routes	Implementation of additional signage and/or lighting, to provide reasonable safety and security for pedestrians and bicyclists. *Maintain safety for bicyclists and pedestrians traveling on trails and between facilities with temporary enclosures or clear passage. *Disseminate information about construction, closures and detours. *On posted traffic detours, add signage along bicycle routes that may experience an increase in vehicle traffic and an associated increased potential for vehicle and bicycle interactions, *Provide separate queuing space for bicycles and traffic calming measures in work zones to improve safety for bicyclists.	NEPA
3.8 Historic and Archaeological Resources		
Removal of 1917 NRHP-listed bridge	*Prepare a Bridge Marketing Plan that will ensure that all appropriate efforts will be attempted to find an alternative use including separating and relocating individual spans if relocation of the bridge in its entirety is not feasible. *Complete Historic American Engineering Record documentation consisting of a context statement; a minimum of 40 large format photographs; aerial perspective photographs; construction design plans, as-built plans, and narrative documentation of distinctive attributes. *Distribute HAER documentation to local libraries, museums, educational, and historic institutions as listed in the Section 106 MOA. *Salvage and develop a plan for reuse of decorative or character-defining elements of the existing bridges *Develop an interpretive program including a web page and printed materials. Promote access to and make these materials widely accessible. *Develop Multiple Property Documentation for the remaining bridges along the old Pacific Highway in Oregon. Develop a National Register of Historic	Section 106 of NHPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	Places (NRHP) nomination for an individual, notable resource in Oregon. *Revise and update previous Multiple Property Documentation for bridges constructed in Washington and determined eligible for the NRHP. For at least one bridge, an individual NRHP nomination will be developed.	
Removal of Pier 99 Building in Oregon	*Complete Historic American Building Survey documentation consisting of a context statement; a minimum of 20 large format photographs; aerial perspective photographs; construction design plans, as-built plans and narrative documentation of distinctive attributes. *Distribute HAER documentation to local libraries, museums, educational, and historic institutions as listed in the Section 106 MOA. *Salvage and develop a plan for reuse of decorative or character-defining elements of the building. *Develop an interpretive project including printed materials. Promote access to and make these materials widely accessible. *Develop Multiple Property Documentation for postwar boat and automobile dealership showroom buildings in the greater Portland area. An individual NRHP nomination will be developed for at least one notable postwar resource.	Section 106 of NHPA
Vancouver National Historic Reserve (and associated district) land acquisitions, visual, noise, cultural landscape	*In close coordination with the NPS and the City of Vancouver, design and construct landscaping and interpretive elements of the Evergreen Community Connector. *Develop a Construction Vibration and Settlement Management and Monitoring Plan for areas near the Post Hospital. *Develop a Visual Management Plan or work with visual elements of an existing VNHR management plan addressing visual effects. *Provide funding for the design and the renovation of Building 405 into a fully operational curation facility.	Section 106 of NHPA
Visual impact to Clark County Historic Museum (Carnegie Library at 1511 Main Street)	*Develop design treatments and approaches for the Mill Park and Ride that will be compatible with the adjacent, historic Carnegie Library building.	Section 106 of NHPA
Noise impacts to NRHP-eligible homes on 17th Avenue	*Provide window improvements and/or air conditioning for residential sound insulation in accordance with the Secretary of Interior Standards for Rehabilitation.	Section 106 of NHPA and NEPA
Temporary Effects		
Disruption to downtown Vancouver may have an effect on the economic viability of the historic commercial buildings. During construction, the economic viability of the businesses in the downtown historic buildings would likely diminish because of access and parking issues.	*See Land Use and Economic Activity section*	NEPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
Potential for construction-related impacts to two historic structures: the Barracks Hospital building and Clark County Museum	*WSDOT, in consultation with NPS and the City of Vancouver, will develop a Construction Vibration and Settlement Management and Monitoring Plan that will 1) define a pre-construction analysis of vibration and settlement analysis to determine effect thresholds and appropriate measures that might be needed to minimize vibration and settlement risks during construction, 2) define vibration and settlement monitoring and analysis methods to be used during construction and protective response procedures if adverse effects to structural and/or material integrity occur and/or appear imminent.	
Potential for construction-related impacts to VNHR (noise, night-work lighting)	*Cultural Resources MOA will include recommended management practices, with necessary corrective action taken, intended to mitigate temporary noise and light impacts, and other mitigation as required in the MOA.	
Temporary construction easements for construction throughout the project area	*Construction specifications will require that properties be restored to landowners in similar condition after construction is complete.	NEPA
Construction could impact archaeological resources	The following measures will be employed: *Develop an Archaeological Treatment Plan addressing methods for integrated rapid data recovery; mitigation for impacts to sites considered significant under criteria A, B, and C; and curation and interpretive methods. *Update the 2009 Inadvertent Discovery Plan addressing archaeological resources not previously identified in the Treatment Plan, and the treatment of human remains. *In advance, test landforms identified as having the potential for supporting archaeological remains. *Monitor during project construction. *Test for archaeological sites potentially buried in the deep sediments that have accumulated along the south shore of the Columbia River. *Disposition of any artifacts or samples recovered during archaeological investigations or during construction will be determined in consultation with agencies, property owners, and appropriate tribes, with consideration given to feedback from other interested parties. *Curation of recovered materials is an essential element of archaeological investigations and is required as part of federal and state permitting processes.	

Impact from the SA	Mitigation or Compensation	Regulatory Driver
3.9 Visual and Aesthetics		
General intrusion of CRC project on views	The following techniques will be employed to improve or offset the visual effects of the CRC project. Plans and specifications to be determined during final design: *Plant vegetation, street trees, and landscaping for screening or visual quality. *Design landscape plans and other visual treatments consistent with adopted guidance and plans. *Shield station and facility lighting from nearby residences and the night sky. *Minimize structural bulk, such as for ramps and columns. *Minimize the number of pier columns in the SR 14 interchange design. *Design architectural features to blend with the surrounding community context. *Place public art (to be relocated when necessary and added as part of transit stations and gateways). *Integrate lighting with facilities in a manner that produces a positive visual and aesthetic impact, reduces night-sky light pollution, reduces possible light trespass into residential units, and contributes to crime prevention through environmental design (CPTED). *Utilize UDAG Design Guidelines, as well as those of both cities and the transit agencies. *Select new and replacement pole and utility cabinet locations, colors, and styles in relation to their context and in accordance with municipal lighting standards.	NEPA
Columbia River		
Visual change due to higher bridges and ramps; removal of bridge towers	*The proposed bridge design will present less visual clutter for skyline or horizon views while maintaining the drama (vividness) that large-span bridges add to views. A potential lighting scheme, to be determined in final design, will contribute to vividness in the corridor. With indirect lighting, it will help to minimize light trespass.	NEPA
Addition of piers for ramp bridges and local multimodal bridge in North Portland Harbor		
Vancouver National Historic Reserve		
Specific views would experience a high degree of change, including views from the Hudson's Bay Company Village and Post Hospital.	*A screening and landscaping plan for the Village area will be developed in consultation with the National Park Service. See section below regarding Community Connector.	NEPA
Light rail stations, facilities would visually alter existing views on streets	*Each transit station will be designed with consistent design treatments that tie facilities together. Each	NEPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	transit station and park and ride will be the subject of a design process incorporating relevant guidelines, which will include UDAG guidelines and design guidelines from both cities, C-TRAN, the Central Park Plan, downtown stakeholders, and the general public.	
Transit bridge "landing" in Vancouver: The landing would require a very large, solid footing that would occupy much of a block of Washington Street.	Will include robust landscaping, public art, or other façade treatments for the walls of the structure.	
Park and Rides		
Clark Park and Ride structure would be inconsistent with mid-rise buildings of nearby campus.	*Will meet city design guidelines. *The public and technical process will inform decisions on façade treatments, landscaping, lighting, and the mix of uses.	NEPA
Mill Plain Park and Ride would be inconsistent with existing single-story surroundings, but consistent with the projected levels of development in the Vancouver City Center Vision Plan.		
Highway Footprint		
On Hayden Island, the SA highway's mainline footprint will be wider than existing facility.	*The final design of the Hayden Island interchange will support and be consistent with the City of Portland's Hayden Island Plan, utilize the UDAG design guidelines, and incorporate local input.	NEPA
In Vancouver, right-of-way is only slightly wider than existing; visual experience to and from the highway would be substantially altered as sloped landscaped edges become landscaped walls	*A lid over I-5 (the Evergreen Community Connector) has been conceptually developed as part of the project. With the lid, the change in visual character and quality would be substantially different from the existing views. The experience for I-5 motorists will also be very different. Though the connector is not mitigation itself, its design and features will enhance the visual experience for pedestrians.	
Indirect Effects		
Potential development could have beneficial or adverse impacts on historic properties.	*See Historic and Archaeological Resources section* *Since indirect impacts on views are anticipated to be neutral or positive, no additional mitigation is necessary.	NEPA
Temporary Effects		
Construction-related equipment visible	*When practicable, locate construction equipment and stockpile materials in less visually sensitive areas (as defined in WSDOT and FHWA guidelines) and in areas not visible from the road or to residents and businesses in order to minimize visual obtrusiveness.	NEPA
Vegetation removed for construction	*Revegetation	
Lighting for nighttime construction could affect residential areas	*Shield construction site lighting to reduce spillover of light onto nearby residences and businesses.	
Off-site staging, Port of Vancouver Parcel 1A—low degree of visual change	*Shield construction site lighting to reduce spillover of light onto nearby residences and businesses	NEPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
Off-site staging, Red Lion Hotel site—moderate degree of visual change Off-site staging, Old Thunderbird Hotel—high degree of visual change	*When practicable, locate construction equipment and stockpile materials in less visually sensitive areas (as defined in WSDOT and FHWA guidelines), and in areas not visible from the road or to residents and businesses in order to minimize visual obtrusiveness.	
3.10 Air Quality		
No long-term, direct impacts to mitigate.		
Temporary Effects		
Generation of dust from construction activities, direct exhaust emissions from construction equipment, and exhaust emissions from a temporary increase in congestion on the mainline highway and local streets in the project area. Traffic congestion increases idling times and reduces travel speeds, resulting in increased vehicle emission levels.	*Construction mitigation will focus on controlling dust and exhaust emissions from demolition and construction activities and on minimizing the effects of traffic congestion. The contractor will be required to develop a pollution control plan that includes documentation of operational measures that will be used to reduce emissions. Section 290 of the Oregon standard specifications describes requirements for environmental protection, including air pollution control measures. *Haul routes will be restricted from sensitive receptors such as schools, nursing homes, hospitals, etc. *Contractors are required to comply with Oregon standard specifications (Section 290) for dust, diesel vehicles, and burning activities described above. Section 290 requires contractors to comply with Oregon Revised Statutes (ORS) 468 and 468A, Oregon Administrative Rules (OAR) 340-014 and OAR 340-200 through OAR 340-268, and all other applicable laws. In order to control dust, the project will require all contractors to develop and implement a dust control plan and to maintain air quality permits on all portable equipment. *Follow Oregon's specifications for truck staging areas for diesel-powered vehicles—should be located where truck emissions have a minimum impact on sensitive uses such as residences, schools, hospitals and nursing homes. Trucks and other diesel-powered equipment will limit idling to 5 minutes when the equipment is not in use or in motion or in a limited set of additional circumstances. *In Vancouver, Washington Administrative Code (WAC) 173-400-040 places limits on fugitive dust that causes a nuisance or violates regulations. In addition to compliance with WAC, WSDOT will voluntarily comply with Oregon's standard specifications related to air quality for work performed in Washington. *Diesel construction vehicles and equipment will use ultra-low sulfur diesel or will otherwise comply with any new regulations in place at the time of construction. In addition, ODOT and WSDOT are evaluating potential additional emission control technologies for	Section 290 of the ODOT standard specifications and ORS 468 and 468A, OAR 340-014 and 340-200 through 340-268. Washington Administrative Code (WAC) 173-400-040

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	construction equipment. ODOT and WSDOT will continue to monitor and evaluate changes in technology and related regulations. Decisions regarding any additional emission controls will be made during final design. *WSDOT and ODOT will work with neighborhoods and vulnerable populations to address their air quality concerns as the project moves into final design and then into construction.	
Off-site staging and casting: Construction of concrete structures or asphalt paving activities may require equipment or operations that will emit pollutants.	Stationary sources, such as concrete mix and asphalt plants, are required to obtain an Air Contaminant Discharge Permit from either DEQ or SWCAA and to comply with regulations for controlling dust and other pollutant emissions.	Air Contaminant Discharge Permit from either DEQ and/or SWCAA
3.11 Noise and Vibration		
Highway noise impacts	Noise walls, where reasonable and feasible, along highway right-of-way, to comply with WSDOT and ODOT noise manuals.	23 CFR 772, WSDOT Traffic Noise Analysis and Abatement Policy and Procedures, ODOT Noise Manual
Moderate transit and local road noise impacts to floating homes	Sound barriers along portions of the elevated local multimodal bridge structure where noise impacts would occur, based on final design, and where found to occur after initiation of operations	FTA Transit Noise and Vibration Impact Assessment Report
Moderate transit noise impacts to single family residences, including warning bell at crossing gate. Additional residential properties may be identified during final design.	Implement the following measures: *Residential sound insulation, as noted in the FEIS (see attached map Figures A-4 to A-5 for illustration of impacted properties). *Warning bell equipped with direction shrouds *Track curves with a radius of 300 feet or less, or where otherwise needed, equipped with wayside lubricators *Sound barriers, as noted in the FEIS (see attached map Figures A-1 to A-5) *Special trackwork crossovers and turnouts, as noted in the FEIS	FTA Transit Noise and Vibration Impact Assessment Report
Transit vibration impacts	*Rail boots installed along the entire embedded track portion of alignment *Minor modifications to the existing rail track and electrical system on the Steel Bridge *Ballast mats where impacts are considered significant *Resilient fasteners and rail boots where impacts are considered significant *Tire-derived aggregate where found to be effective and impacts are considered significant *Special trackwork at crossovers and turnouts (such as spring-rail, flange-bearing, or moveable-point frogs) where impacts are considered significant	FTA Transit Noise and Vibration Impact Assessment Report

Impact from the SA	Mitigation or Compensation	Regulatory Driver
Temporary Effects		
General construction can result in noise and vibration effects to surrounding receivers near project area.	Whether in Oregon or Washington, contractor will comply with state and local standard specifications relating to noise.	WAC 173-60, Section 290 of the ODOT standard specifications, Portland Municipal Code, Vancouver Municipal Code
Vibration generated by general construction can result in vibration effects to surrounding receivers.	Contractor will perform vibration monitoring of all activities that are expected to produce vibration levels at or above 0.5 inch per second, where practicable. If vibration levels approach this standard, alternate construction methods will be employed, as needed, to avoid vibration-related damage.	NEPA
3.12 Energy		
No long-term, direct impacts to mitigate.		
Temporary Effects		
SA construction would require 11.48 million mBtus of energy	A variety of measures will reduce energy consumption during construction. As the project advances in design and more detail becomes available, additional analysis will help further identify specific measures and approaches for reducing energy consumption during construction. Mitigation measures to be employed: *Reuse and recycle construction materials where feasible and practicable. *Encourage workers to carpool or use transit. *Turn off equipment when not in use to reduce energy consumed during idling. *Maintain equipment in good working order to maximize fuel efficiency. *As practical, route truck traffic through areas where the number of stops and delay times will be minimized, and use off-peak travel times to maximize fuel efficiency. *As practical, schedule construction activities that would temporarily hinder traffic flow to be conducted during off-peak hours when traffic volumes are considerably lower. *As practical, schedule construction activities during daytime hours or during summer months when daylight hours are the longest to minimize the need for artificial light.	NEPA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
3.13 Electric and Magnetic Fields		
No impacts to mitigate.		
3.14 Water Quality and Hydrology		
Water Quality		
The SA would slightly increase pollution generating impervious surface area, but greatly decrease the amount of untreated impervious surface area. The SA would decrease anticipated pollutants entering all surface water features in the project area compared to the No-Build Alternative, with the exception of dissolved copper at the Columbia Slough which may experience a slight increase (0.01 to 0.02 lbs per year)	*Project will incorporate stormwater management and treatment measures prior to stormwater being infiltrated or released to surface water. *Project will complete all necessary stormwater-related permits. *Some or all of the water quality BMPs from ODOT's stormwater quality memo or more stringent applicable standards will be included in the CRC project. *Re-vegetation of construction easements and other areas after the project is complete will be performed.	Section 401 (Clean Water Act). NPDES. Local stormwater management guidelines.
Hydrology		
Encroachment in floodplains	*Flood-rise impact to the Columbia River is expected to be negligible, based on preliminary design. A flood-rise analysis will be conducted during the final design to verify the impact of the piers in the water. If necessary, mitigation will be identified to negate flood rise impacts.	Executive Order 11988
Temporary Effects		
Temporary in-water impacts		
Construction of bridge piers could increase turbidity.	*The project will use cofferdams for shallow pier construction to decrease turbidity.	Section 404 and Section 401 (Clean Water Act)
Construction of bridge piers could disturb existing pollutants.	*The project has conducted sediment sampling in the Columbia River and North Portland Harbor. The results came back clean. Dredged sediment has been approved for in-water disposal by the U.S. Army Corps of Engineers.	
Construction of bridge piers could introduce new pollutants to waterways.	*To prevent new contaminants from entering waterways, the project will employ such measures for full containment of hazardous materials during construction and for collecting and containing water coming into contact with untreated concrete.	
Temporary upland, below-grade construction		
Dewatering can increase the likelihood of existing contaminants migrating through the groundwater and potentially into surface waters.	*Sites with existing soil or groundwater contamination near construction areas have been identified and will be further studied and tested before any groundwater pumping occurs, in order to avoid causing such contamination to spread. Monitoring of this possible ground water contamination will continue throughout the project dewatering process.	CERCLA. Section 401 (Clean Water Act). OAR 340. WAC 173
Temporary ground disturbance		
Due to the generally flat topography, construction of SA is not likely to cause substantial amounts of erosion. However, construction activities can increase soil	The project will comply with all requirements and permits required under National Pollutant Discharge Elimination System (NPDES) and other related permit required.	NPDES. City of Portland Codes (CPC) Title 10 and Vancouver Municipal

Impact from the SA	Mitigation or Compensation	Regulatory Driver
erosion; if runoff contains extra sediment from erosion, waterways can become turbid and can build up excessive sediment deposits. Main risk is at the I-5/SR 500 interchange near Burnt Bridge Creek.	*Construction Stormwater Discharge Permits will regulate the discharge of stormwater from construction sites. These permits include discharge water quality standards, runoff monitoring requirements, and provision for preparing a Stormwater Pollution Prevention Plan (SWPPP). *The SWPPP will contain all the elements of a Temporary Erosion and Sediment Control Plan (TESCP) and Spill Prevention Control and Countermeasures Plan (SPCCP). *The contractor will meet the requirements of and follow the process described in ODOT Standard Specifications Section 00280.30 and/or WSDOT Standard Specification 8-01.3(1)B. *The erosion and spill control (ESC) lead will be listed on the Emergency Contact List as part of ODOT Standard Specifications Section 00290.20(g) and/or WSDOT Standard Specification 1-05.13(1). The ESC lead will also be responsible for ensuring compliance with all local, state, and federal erosion and sediment control requirements. *All TESCP measures will be inspected as prescribed. Contractor will follow maintenance and repair as described in ODOT Standard Specifications Section 00280.60 to 00280.70 and/or WSDOT Standard Specification 8-01.3(15).	Codes (VMC) Chapter 14.24
Temporary off-site staging and casting		
May increase stormwater runoff and may increase pollutant levels in the runoff	*See mitigation measures above: NPDES, SWPPP, TESCP, SPCCP*	See regulatory drivers above
3.15 Wetland and Jurisdictional Waters		
Direct impact to wetland buffers and environmental zones at Victory Interchange, Kiggins Bowl, and Burnt Bridge Creek	*In Oregon, if the CRC project is not exempt from environmental zone regulations (33.430.080) and the project does not meet the City of Portland's development standards (33.430.140 through .190), environmental review and mitigation will be required by the City. The mitigation site plan must demonstrate that the mitigation will replace all of the resources and functions affected, will be within the same watershed as the affected environmental zone (unless another location better achieves the mitigation objectives), and that a suitable mitigation site is owned by the applicant. *In the project area in Washington, wetland buffers are regulated by the City of Vancouver under its critical areas protection ordinance. Compensatory mitigation is required to address affected functions by achieving a functional equivalency or improvement and providing a similar wetland or buffer function. Approval criteria require no net loss of functions or values for any activity impacting a critical area.	Clean Water Act, City of Portland environmental zone regulations, City of Vancouver critical areas protection ordinance

Impact from the SA	Mitigation or Compensation	Regulatory Driver
Possibility of impact to potential Vancouver Way Wetland	ODOT and FHWA will secure right-of-entry to the property containing the potential Vancouver Way Wetland in order to confirm the presence or absence of a wetland at this location. If presence is confirmed, then the project will comply with the relevant regulatory and permitting requirements, including avoiding, minimizing, and mitigating wetland impacts.	Clean Water Act, City of Portland environmental zone regulations, Oregon Removal/Fill law
New permanent bridge piers in the Columbia River and North Portland Harbor would cover an area of 1.40 acres and displace a volume of 47,400 cubic yards. Demolition of the existing bridges in the main stem of the Columbia River would result in removal activity in approximately 0.64 acre of waterway and 44,300 cubic yards of material, for a net 0.76 acre of river impacted and 3,100 cubic yards water displaced by the SA. In addition, the project may impact roadside ditches that may be considered jurisdictional. As with the existing bridge piers, replacement bridge piers in the Columbia River for the SA may result in long-term impacts to aquatic species, including protected fish species.	*Include mitigation and conservation plans and actions to identify and implement habitat protection, restoration, and enhancement as appropriate. These actions are intended not only to compensate for unavoidable impacts of bridge construction and demolition to species, habitats, and resource sites, but to achieve a "net conservation benefit." *A net conservation benefit could be achieved with participation in the following projects. (If CRC is unable to participate in these projects, comparable third-party mitigation will be identified to comply with the Clean Water Act, Washington Hydraulic Approval, Oregon Removal/Fill and Washington Shoreline Management Act compliance.) *In Oregon, the Hood River Off-Channel Reconnection Project is planned as compensatory mitigation for temporary and permanent impacts to the Columbia River. *In Washington, the Lewis River Confluence Side Channel Restoration Project is planned. *Mitigation for impacts to jurisdictional ditches, if any occur, will likely involve reconstruction of the ditches and re-vegetation with native plants.	Clean Water Act, Oregon Removal/Fill law, Washington Hydraulic Project Approval, Washington Shoreline Management Act
Temporary Effects		
Temporary impacts to wetlands buffers and waterways are more likely to occur at locations where long-term impacts are anticipated. Temporary impacts may include impacts to roadside ditches that may be considered jurisdictional.	*Mitigation measures include replacement of vegetation that is cleared for construction activities in accordance with local regulatory guidance. *Temporary disturbances to wildlife activity, hydrology, and water quality will be avoided as much as possible through the use of best management practices such as silt fences, construction fencing, and wildlife exclusionary netting during the construction process. *Mitigation for these impacts will likely involve reconstruction of the ditches and re-vegetation with native plants.	City of Portland Environmental Zone regulations. City of Vancouver Critical Areas Ordinance
The staging and casting/assembly sites may contain wetlands, and activities may increase stormwater runoff over existing conditions and may increase pollutant loading.	The development and use of any staging and casting sites will meet all applicable stormwater requirements during and following utilization of the sites. All necessary permits will be secured prior to site development and operations, and the project will be required to avoid, minimize and mitigate wetland impacts, if any would occur.	Federal, state, and local regulations

Impact from the SA	Mitigation or Compensation	Regulatory Driver
3.16 Ecosystems		
Larger piers would continue to provide cover for predatory fish and displacement of shallow water habitat (although the project would provide a net gain in shallow water habitat). Existing bridge habitat for Peregrine falcons would be removed (although no long-term adverse effects on the overall viability of the species in anticipated). The project will be constructed in areas that have protected habitat (Washington Priority Habitat, Vancouver Critical Areas, Metro Title 13, and City of Portland E-zones); however, the additional acreage should not adversely affect the overall function of terrestrial and riparian habitat or the long-term sustainability of plant and animal species in the project area. The project will be mostly constructed over existing roadways or within existing rights-of-way.	Mitigation measures will include discouraging predator use of piers and promoting aquatic habitat conservation efforts through the following: *A Hydraulic Project Approval (HPA) issued by WDFW, a Removal-Fill Permit issued by DSL, and a Section 404 permit issued by USACE under the Clean Water Act will likely require mitigation actions for construction activities that will affect fish and shellfish habitat of state waters. *Long-term impacts to terrestrial and riparian resources will be addressed through avoidance and minimization measures and replanting vegetation.	City of Portland Environmental Zone regulations. City of Vancouver Critical Areas Ordinance. Section 401 and 404 of the Clean Water Act. Washington Hydraulic Project Approval. Endangered Species Act.
Temporary Effects		
*In-water construction of bridge piers could stir up sediments from the riverbed, which would increase turbidity and adversely affect fish. *Cofferdams installed to isolate work areas around bridge piers would temporarily displace aquatic habitat. *Underwater noise from impact pile driving and heavy machinery could injure or kill nearby fish. *Underwater and in-air noise impacts to sea lions may include disturbance and behavioral effects. *Temporary in-water construction platforms and work barges could shade a total of 108,000 square feet of the river, providing potential cover for fish species that prey on salmon. *Construction-related contaminants could enter the water during this work. *Disturbance from construction activities could kill fish, delay migration, or lower reproductive success. *Benthic organisms could be displaced from the river bed during in-water construction work, but are likely to return rapidly once that work is over.	*NPDES Construction Stormwater Discharge Permits will regulate the discharge of stormwater from construction sites. These permits include discharge water quality standards, runoff monitoring requirements, and provision for preparing a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP will contain all the elements of a Temporary Erosion and Sediment Control Plan (TESCP) and Spill Prevention Control and Countermeasures Plan (SPCCP). *Turbidity caused by any activity inside the cofferdams will be contained within the cofferdams. *Immediately after isolation and dewatering of the in-water work area, isolated fish will be captured and released. Contractor will provide a qualified fishery biologist to conduct and supervise fish capture and release activity to minimize risk of injury to fish, in accordance with ODOT SP 00290.31 (i) or its equivalent and/or the 2006 WSDOT Fish Exclusion Protocols and Standards or its equivalent. *The contractor will prepare a Water Quality Sampling Plan for conducting water quality monitoring for all in-water project activities. *All pumps will employ a fish screen that meets the specifications included in the NMFS fish screen criteria. *To avoid and minimize noise impacts from in-water work, the following measures will be employed during construction:	NPDES. City of Portland Environmental Zone regulations. City of Vancouver Critical Areas Ordinance. Section 401 and 404 of the Clean Water Act. Washington Hydraulic Project Approval. Migratory Bird Treaty Act. Federal, state, and local regulations

Impact from the SA	Mitigation or Compensation	Regulatory Driver
*Riparian vegetation, including herbaceous plants, shrubs, and small trees that are present, may be trampled or removed during project construction. *The existing bridge provides habitat for some migratory birds, including peregrine falcons; this habitat would be removed or disturbed during construction of the SA or the other build alternatives.	*Use drilled shafts to support the permanent in-water piers. *In waters with depths of more than 0.67 meter, employ a bubble curtain or other attenuation to reduce noise impacts from pile driving. *Establish maximum acceptable sound levels for impact pile driving and monitor for compliance. *Establish the impact pile installation hydroacoustic performance measure. *Time noise-producing activities to minimize impacts to fish. *Install temporary piles by means other than impact driving when engineering limits allow. *Establish measures to reduce impacts from temporary pile removal; for example, remove temporary piles with a vibratory hammer rather than intentionally breaking by twisting or bending. *Marine mammal reporting	
*Construction noise, lights, and vegetation removal could negatively affect terrestrial species and birds, including negatively affecting wildlife passage. *Vegetation removal is likely along the existing roadway, especially near interchanges where alterations are planned.	*Best management practices such as erosion control to protect sensitive riparian and terrestrial habitat and replanting of vegetation *Re-vegetate and remove noxious weeds, as determined through the formal permitting process. *Time construction activities to minimize impacts to migratory birds. Use exclusionary measures or other methods of preventing active nesting, as needed.	
Because the off-site staging and casting site selected would be adjacent to the water, it would have the potential to impact the same species as would bridge construction, as well as other species that may be unique to the particular sites	*The development and operations of the assembly/casting yard will be subject to the same federal and state environmental regulations that apply to other aspects of project construction, as well as any other federal, state, or local regulations that may apply to the particular site. All necessary permits will be secured prior to site development and operations.	Federal, state, and local regulations
In-water construction impacts such as hydroacoustic noise, turbidity, contaminant spills and cofferdams can injure or kill ESA-listed species.	*NMFS coordination will be regular and shall include an annual report coordination meeting (by June 15th annually) to discuss the report, and discuss conservation measure effectiveness and any necessary corrective actions. Other meetings will include FHWA and FTA and their contractors (construction and design) to review the following design plans (30% completion) and reports when available: *Stormwater management plan *Spill prevention/pollution control and erosion control plans *Pile-driving and underwater sound management plan *In-water work area isolation plans for all in-water work areas	NMFS Biological Opinion under Section 7 of ESA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	*Salvage notice *Submit a comprehensive annual program report to NMFS by June 1st each year, beginning following the test pile program and continuing until all site restoration is complete.	
In-water construction impacts such as hydroacoustic noise, turbidity, and contaminant spills can harass or harm marine mammals or pinnipeds.	*To avoid and minimize noise impacts to marine mammals from in-water work, the following measures will be employed during construction: *Establishment of monitoring zones *Visual marine mammal monitoring *Ramp-up and shut-down procedures *Hydroacoustic monitoring	NMFS Letter of Authorization under MMPA
3.17 Geology and Soils		
Steep slopes, soils and landslide		
The steep slopes found within the Burnt Bridge Creek area have landslide potential and could be adversely impacted by the SA	*Minimize the extent of construction activities on steep slopes identified in Burnt Bridge Creek drainage area in order to reduce landslide potential. *Where steep slopes are adversely impacted, the SA will include retaining walls or other stabilization techniques, reducing soil erosion and lowering the potential for slope failure. *Further assess existing geologic hazards such as, but not limited to, faults, ancestral landslides, steep cut slopes, and soil liquefaction during the final engineering stage of the project. Site-specific assessments will include additional geotechnical testing and monitoring.	Federal, state, and local building codes or standards
Geologic resources		
The SA will use top soil, fill, aggregate, quarry rock, concrete, and asphalt resources. Some will consist of new mined or quarried materials.	*To the extent practicable, recycle or reuse aggregate, quarry rock, asphalt, and concrete materials generated by project-related demolition and construction activities.	NEPA
Groundwater resources		
Subsurface structures may change localized groundwater movement.	*To the extent practicable, locate stormwater treatment facilities away from City of Vancouver well head protection zones for Water Stations 1 and 3. EPA conditions of approval under Federal Sole Source Aquifer Program requires soil and groundwater samples be taken at each site where highway piles and shafts will be placed. Focused Environmental Assessment Work Plan will be implemented to ensure construction activities do not exacerbate contamination or affect groundwater quality. *Conduct Focused Environmental Site Assessments (FEAs) in areas not covered by Phase 1 or 2 Environmental Site Assessments (ESA). During project construction the FEA work plan will address the potential to encounter hazardous materials at specific sites, impacts of construction on hazardous	NPDES. Safe Drinking Water Act. City of Vancouver VMC Chapter 14.25 and 14.26, Water and Sewers

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	materials and handling any hazardous materials discoveries. State DOT hazardous material departments within each respective state (Oregon and Washington) will review and approve the Focused Environmental Assessment's (FEAs). As part of the FEA work plan, the DOT hazardous materials departments will coordinate with ODEQ, WDOE and/or EPA on any hazardous materials discoveries and implement the response plan. *Design post project construction completion stormwater infiltration facilities to provide the necessary separation between the bottom of the basin and seasonal high of the groundwater table to minimize any potential of groundwater contamination.	
Indirect Effects		
The SA may facilitate and accelerate development, particularly near the SA's light rail stations, possibly causing increased development in earthquake hazard areas and a potential improvement to groundwater quality through improved stormwater management. The greatest risk from earthquakes in the project area occurs along the banks of the Columbia River and North Portland Harbor.	*No project mitigation needed.	NPDES. Federal, state, and local building codes or standards
Temporary Effects		
The SA will conduct excavation, fill, drilling and grading during construction. Without mitigation, this would result in temporary soil erosion, sedimentation, and impacts to stormwater, surface water, and groundwater quality within the main project area.	*Implement erosion control and stormwater pollution prevention plans during construction.	NPDES. City of Portland Codes (CPC) Title 10 and Vancouver Municipal Codes (VMC) Chapter 14.24
Temporary effects from contaminated soils, sediments, and groundwater may occur, including the potential sites for staging and casting.	*See Hazardous Materials, below, for discussion of mitigation for potential temporary effects related to contaminated soils, sediments, and groundwater.	
3.18 Hazardous Materials		
Acquisition of property may result in an increased liability for existing hazardous materials in the project area.	Perform due diligence before acquiring property, including property transaction screening and Phase I and Phase II Environmental Site Assessments, as appropriate.	CERCLA
Stormwater conveyance system and treatment facilities		
Groundwater and surface water quality can be diminished by petroleum, salts, and other materials contained in stormwater runoff from roadways and bridges. Compared to the No-Build alternative the SA would have beneficial effects to the environment in regards to stormwater quality.	*Stormwater will be managed and treated prior to being infiltrated or released to surface water as required under NPDES and other stormwater management permits. *Prepare a stormwater management and facilities maintenance plan as required under NPDES and other stormwater management permits	NPDES. Local stormwater management guidelines. CWA

Impact from the SA	Mitigation or Compensation	Regulatory Driver
	*Implement stormwater management plans approved by local, state and federal regulatory agencies and constructing facilities as shown in the attached maps (Figures B-1 to B-3).	
Two legacy hazardous materials sites, the Boise Cascade cleanup site and the Harbor Oil Superfund Site, are located within the main project area. Regulatory agencies may require these sites, or newly identified sites, to conduct long-term cleanup actions, and these actions may affect project operations and maintenance. In special cases, cleanup of hazardous materials sites, independent of the CRC project, could require ongoing access across the highway or transit way, for example, for trucks carrying loads of contaminated soil from the site to an off-site disposal area. Such activities have the potential to have long-term impacts on any of the CRC build alternatives.	The following measures, to be developed during final design: *Construction health and safety plans *Spill control and prevention plans *Contaminated media management plans *Conduct lead and asbestos surveys in accordance with CERCLA.	NEPA CERCLA, NPDES
The SA includes the expansion of light rail maintenance infrastructure at the TriMet Ruby Junction Maintenance Facility in Gresham, Oregon. This expansion would include 15 property acquisitions. State regulatory information sources indicate that one of these properties is listed in environmental databases. Potential effects may include clean-up and liability issues related to property acquisitions.	Perform due diligence before acquiring property, including property transaction screening and Phase I and Phase II Environmental Site Assessments, as appropriate to reduce risk associated with existing hazardous materials sites.	CERCLA
Temporary Effects		
Potential for accidental exacerbation of existing hazardous materials sites during construction	*Construction stormwater pollution prevention plans *NPDES construction general stormwater permits *Stormwater conveyance system and treatment facilities monitoring plan *Construction health and safety plans *Spill control and prevention plans *Contaminated media management plan *Lead and asbestos surveys *Well decommissioning: Identified wells within the project footprint that are no longer needed, if any, will be decommissioned prior to or during construction, consistent with OAR 690-220. *Conduct Focused Site Assessments (e.g., Phase I ESA, Phase II ESA, property transaction screen) in accordance with CERCLA.	NPDES. CERCLA. TOSCA. CWA. OAR 340. WAC 173. Safe Drinking Water Act. City of Portland Codes (CPC) Title 10 and Vancouver Municipal Codes (VMC) Chapter 14.24. OAR 690-220, Abandonment of Water Supply Wells and City of Portland Title 21.35, Well Head Protection
Potential for accidental release or generation of hazardous materials during construction	*Construction health and safety plans *Spill control and prevention plans *Contaminated media management plans *Conduct lead and asbestos surveys in accordance with CERCLA.	NPDES. RCRA. TOSCA. OAR 340. WAC 173

Impact from the SA	Mitigation or Compensation	Regulatory Driver
Casting and Staging Sites: potential for increased liability for existing hazardous materials in the project area or accidental exacerbation of existing hazmat sites	Perform due diligence before acquiring property, conduct Phase I and, if necessary, Phase II Environmental Site Assessments in accordance with CERCLA. *See Mitigation measures for Potential for Accidental Exacerbation of Existing Hazardous Materials Sites During Construction.	CERCLA

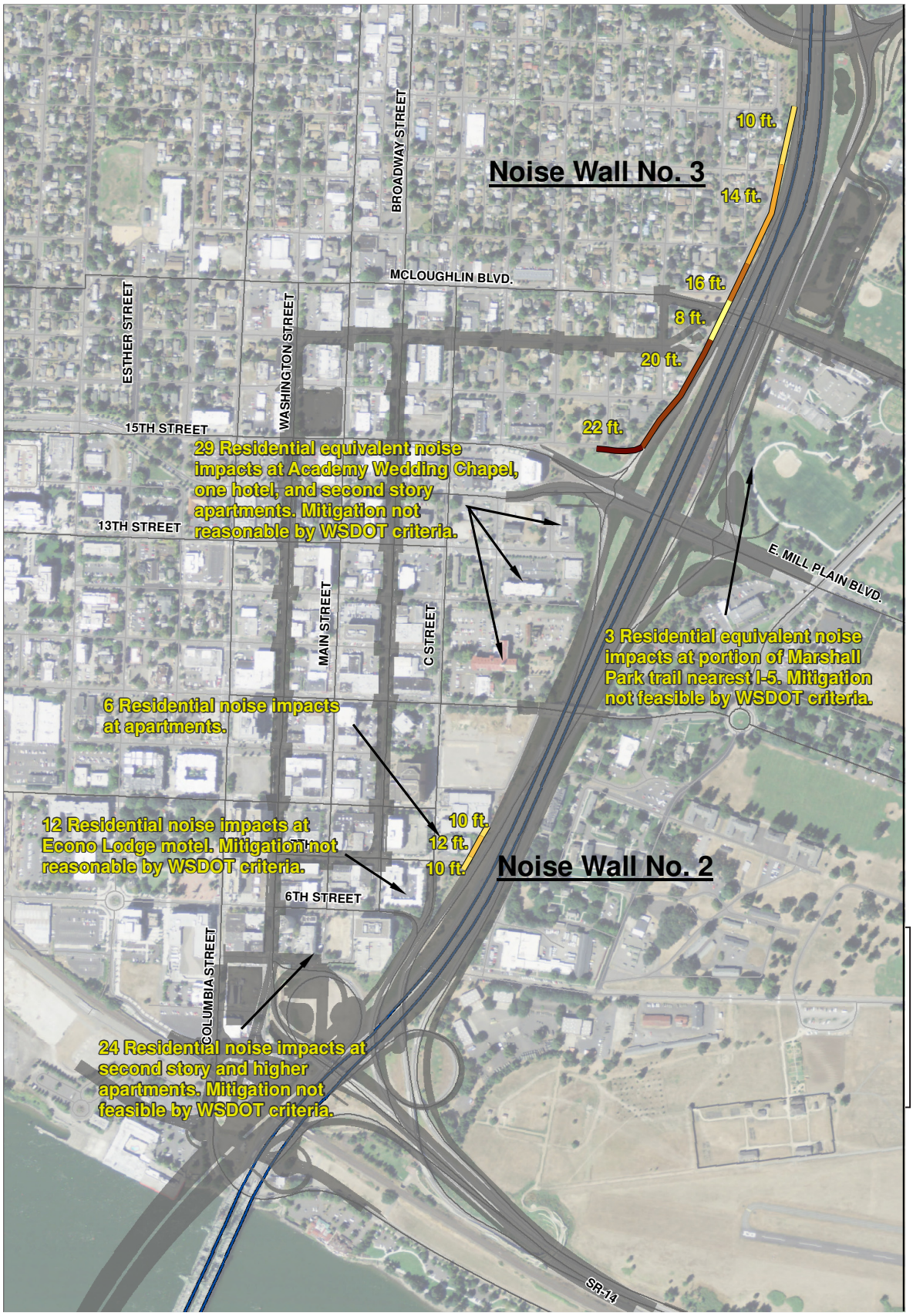


Note: Noise wall heights and locations are subject to change based on final project design.
*Sound wall symbols are not to scale.

Columbia River CROSSING

Figure A-1. Traffic Noise Impacts After Mitigation – VNHR

Record of Decision 2011



Note: Noise wall heights and locations are subject to change based on final project design.
*Sound wall symbols are not to scale

Figure A-2. Traffic Noise Impacts After Mitigation – Downtown Vancouver

Record of Decision 2011

Columbia River CROSSING



Note: Noise wall heights and locations are subject to change based on final project design.
*Sound wall symbols are not to scale

Figure A-3. Traffic Noise Impacts After Mitigation – North Vancouver

Record of Decision 2011

Columbia River CROSSING

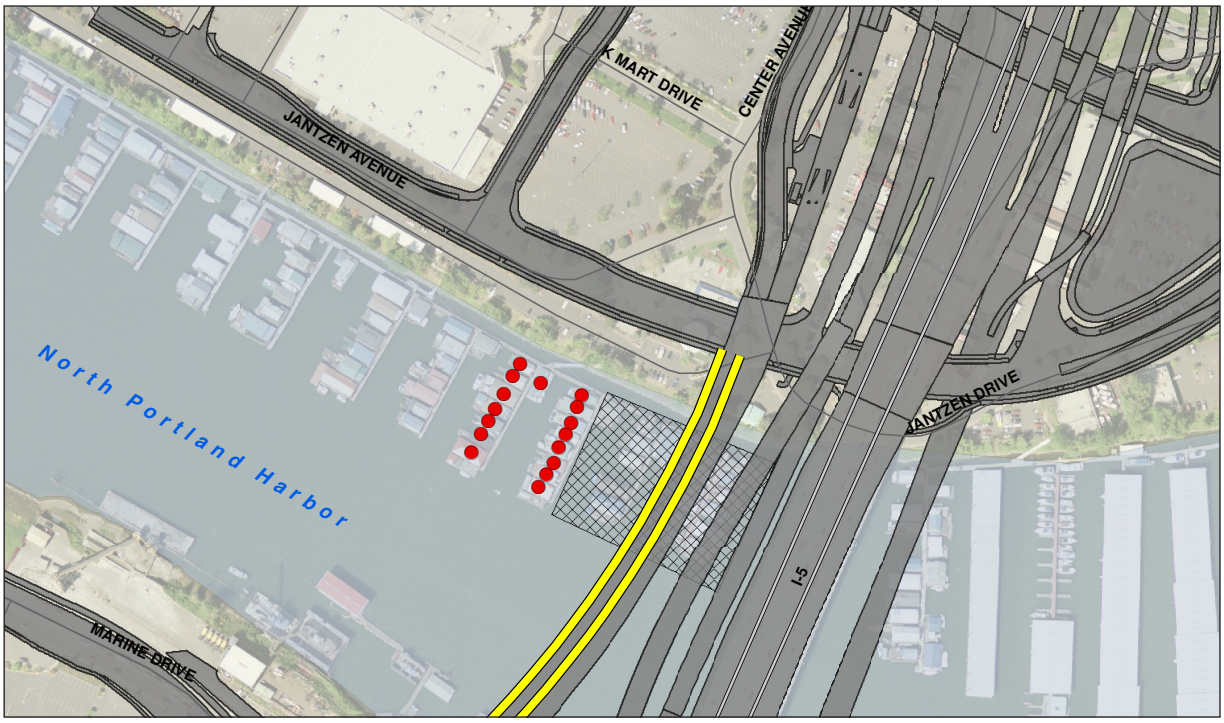
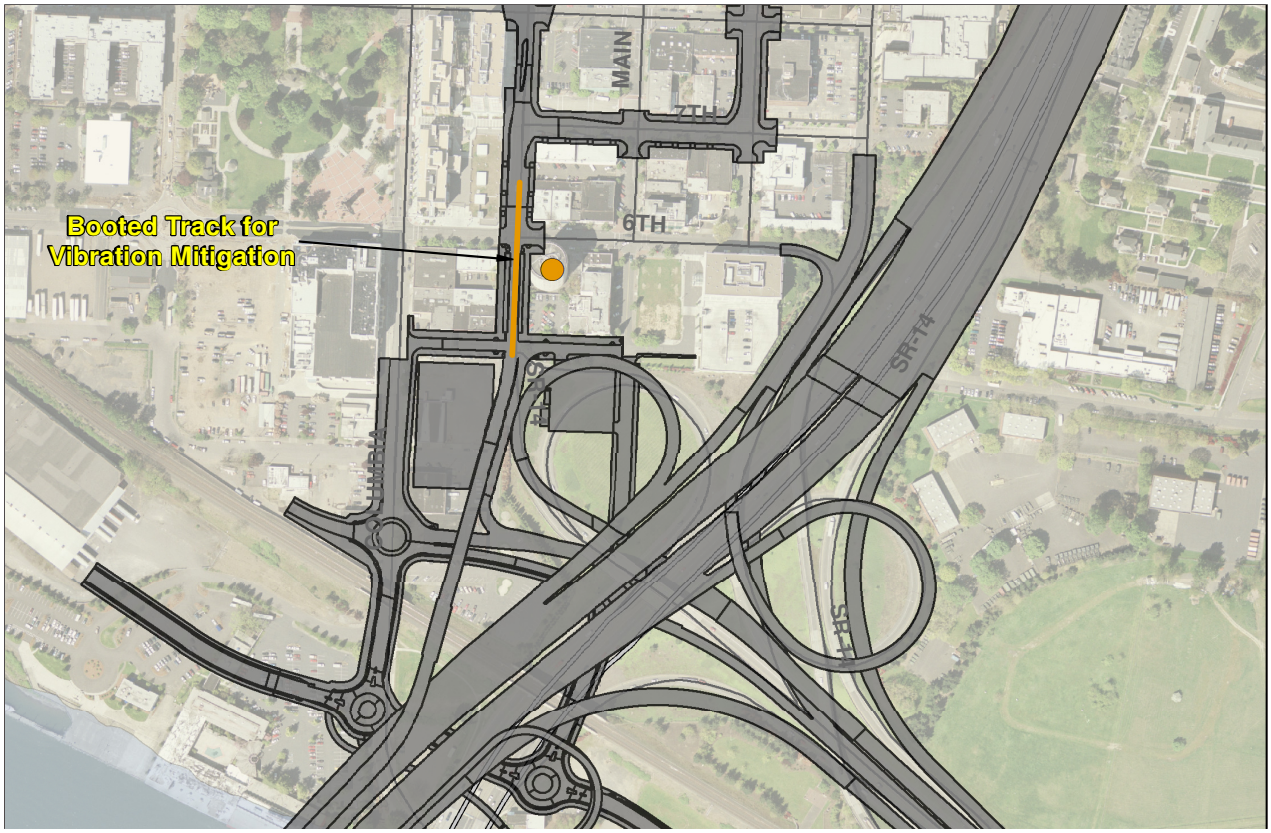


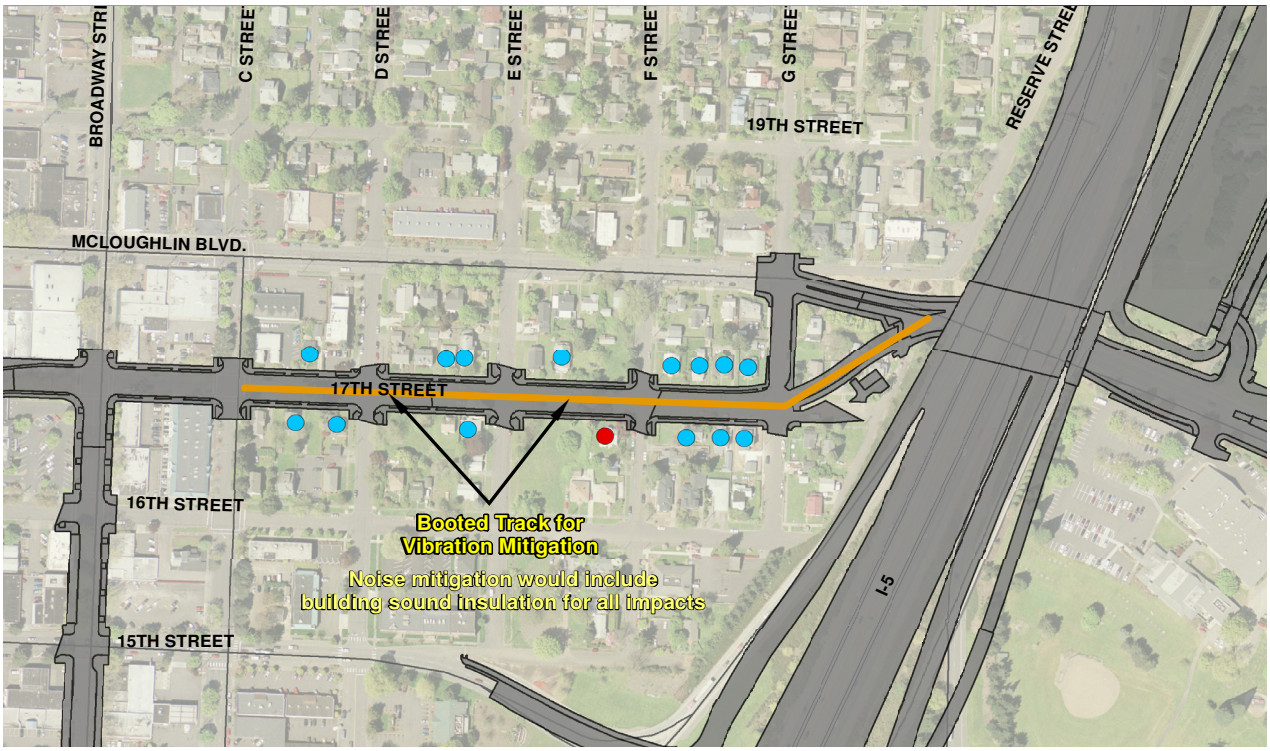
Figure A-4. Light Rail Noise Impact to Floating Homes in Portland

Record of Decision 2011

Columbia River CROSSING



Dimensions are approximate.



Dimensions are approximate.

Figure A-5. Light Rail Noise and Vibration Impacts to Smith Tower and E 17th in Vancouver

Record of Decision 2011

Columbia River CROSSING

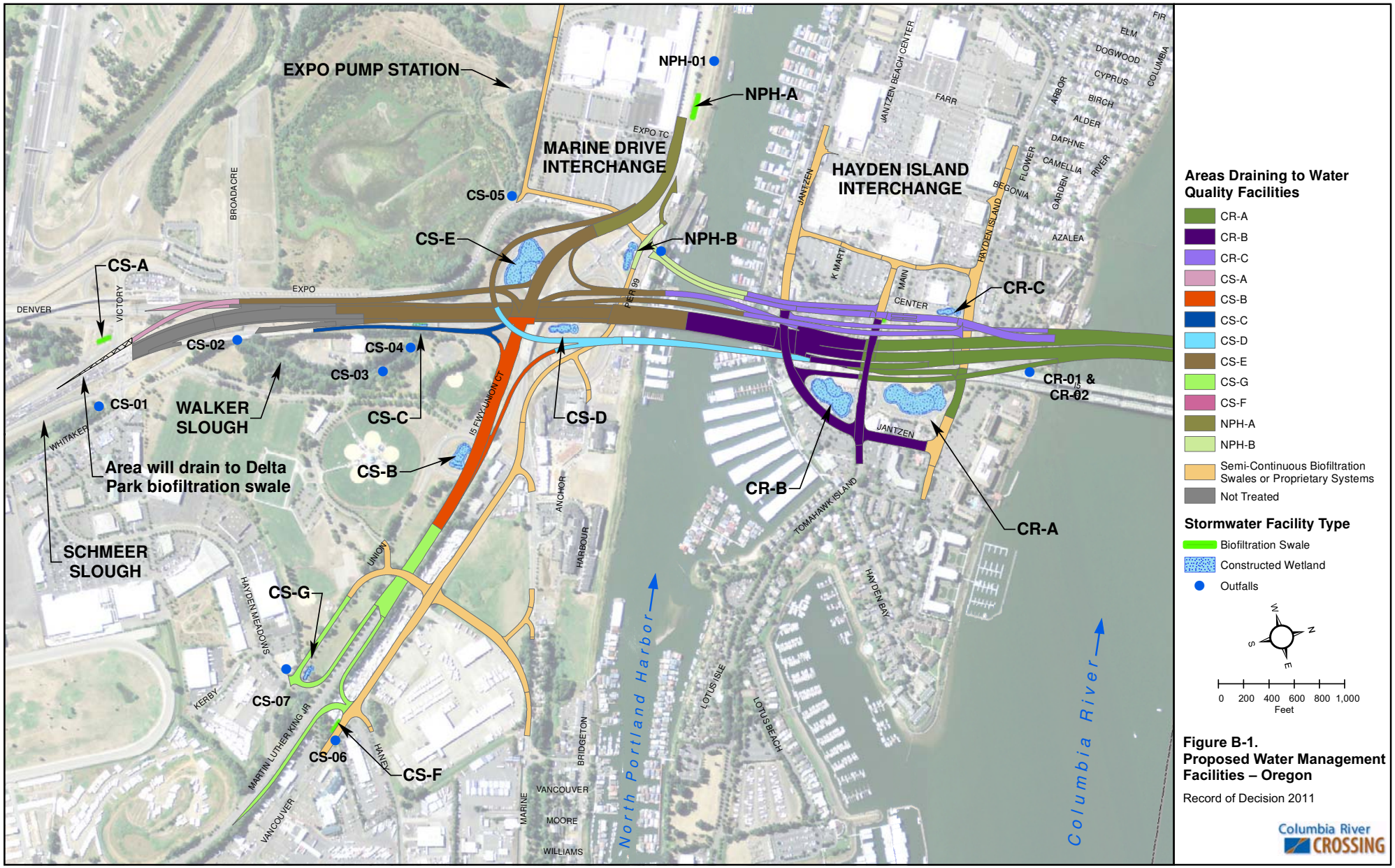


Figure B-1.
Proposed Water Management Facilities – Oregon

Record of Decision 2011

Columbia River CROSSING

Analysis by J. Koloszar; Analysis Date: Dec. 21, 2010; File Name: Ex3_13-9Stormwater_RK251.mxd

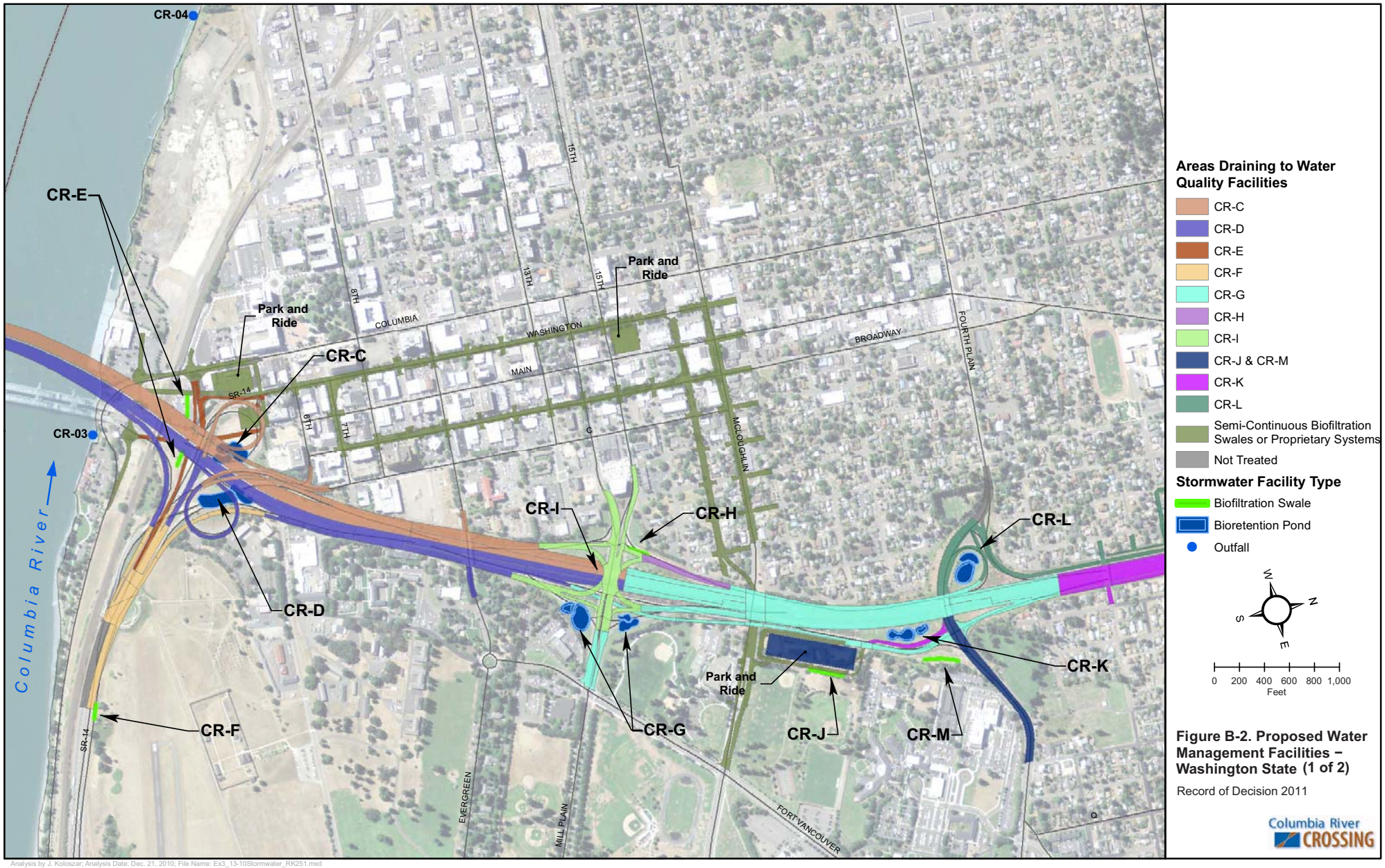


Figure B-2. Proposed Water Management Facilities – Washington State (1 of 2)

Record of Decision 2011

Columbia River CROSSING

Analysis by J. Koloszar; Analysis Date: Dec. 21, 2010; File Name: Ex3_13-10Stormwater_RK251.mxd

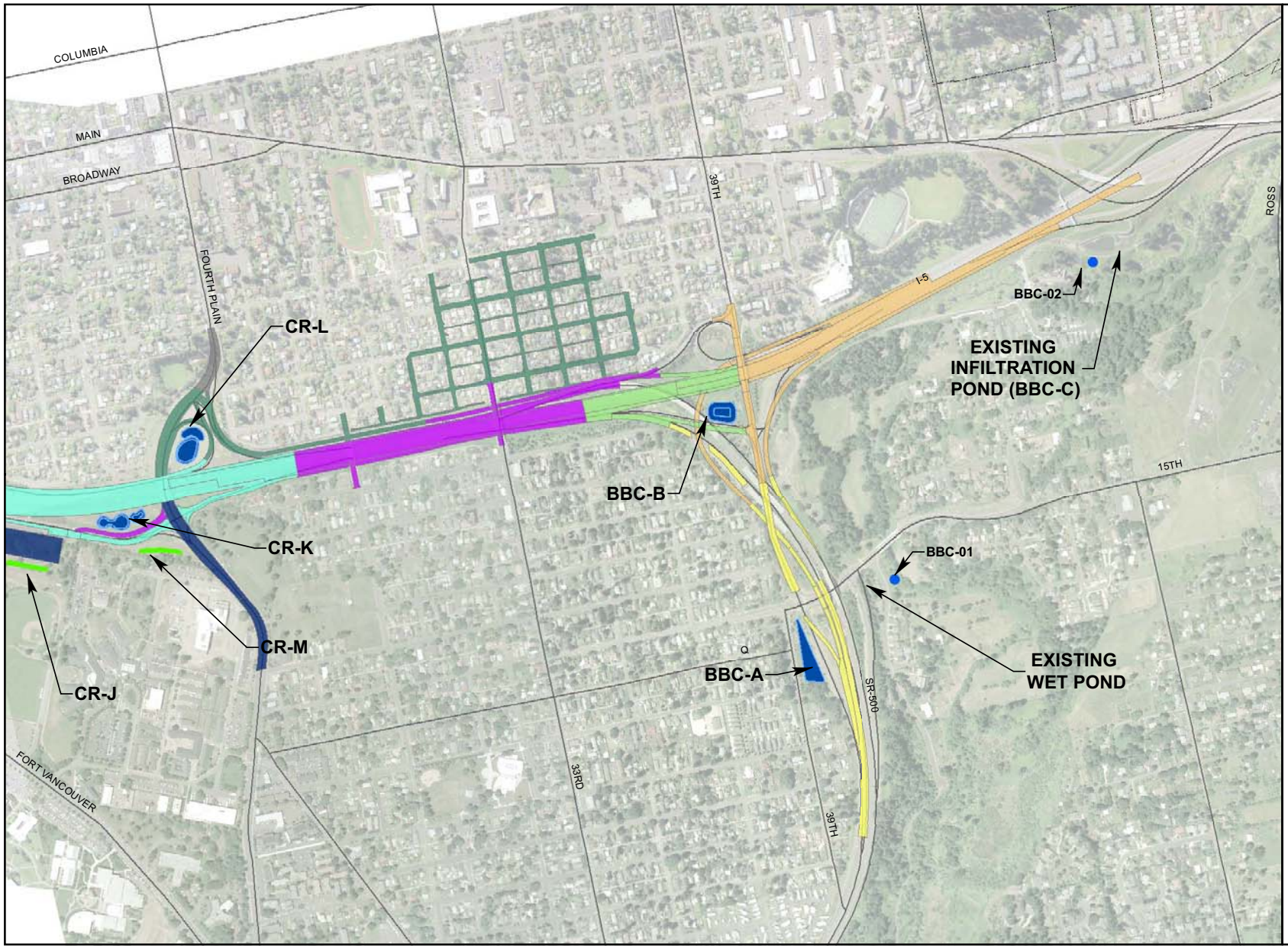


Figure B-3. Proposed Water Management Facilities – Washington State (2 of 2)

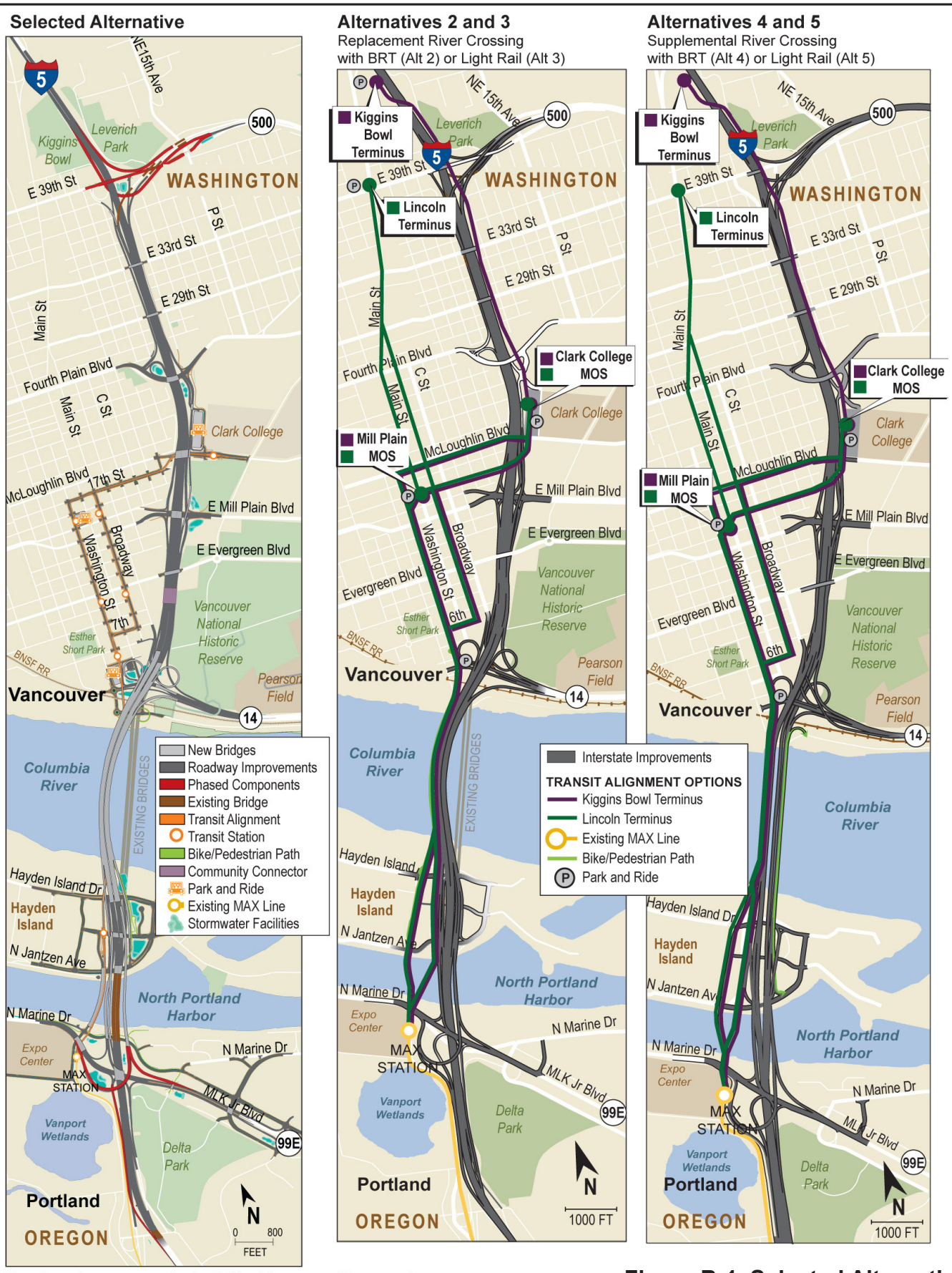
Record of Decision 2011

Columbia River CROSSING

Analysis by J. Koloszar; Analysis Date: Dec. 21, 2010; File Name: Ex3_13-11Stormwater_RK251.mxd

APPENDIX B

MAPS OF SELECTED ALTERNATIVE



Map dimensions are approximate. MOS=minimum operable segment

Figure B-1. Selected Alternative and Alternatives Evaluated in EIS

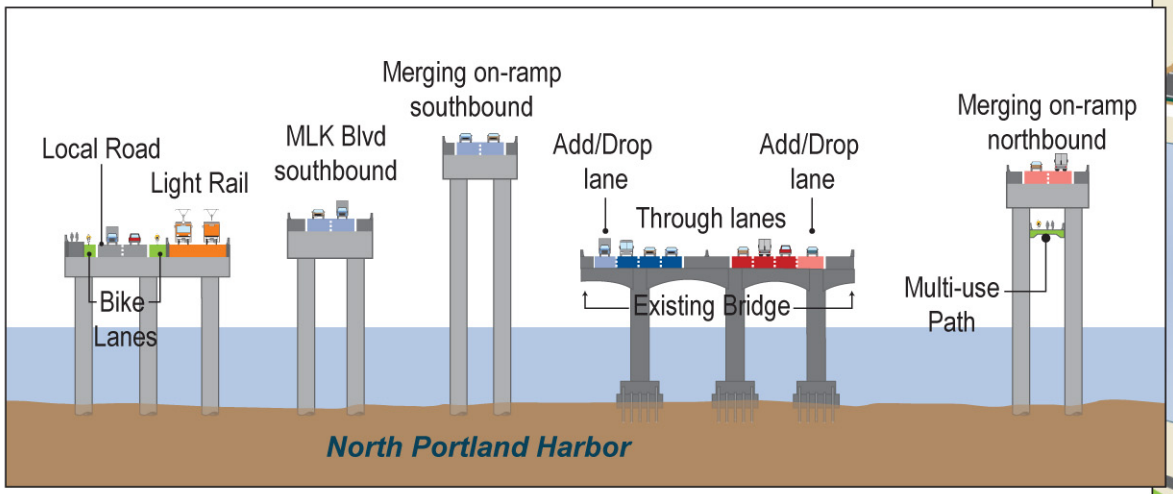
Record of Decision 2011

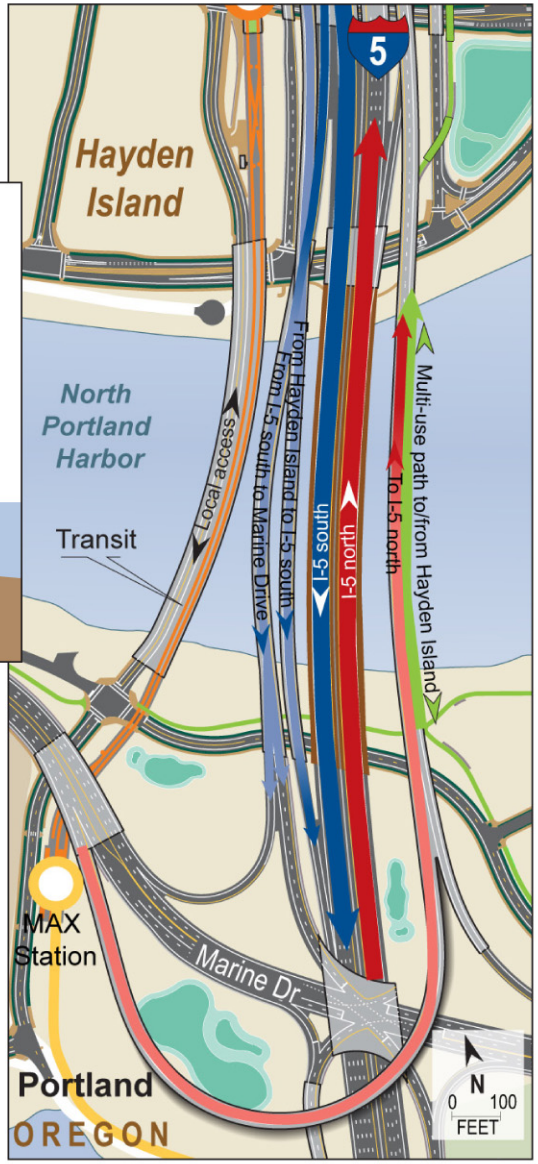


Dimensions are approximate.

Figure B-2. Project Area Map

Record of Decision 2011





Northbound Traffic
Northbound Add/Drop Lane
Southbound Traffic
Southbound Add/Drop Lane
Proposed Transit Alignment
Bicycle/Pedestrian Routes
Local Road
Stormwater Facilities

Not to scale.
Dimensions are approximate.

Figure B-3.
North Portland Harbor Bridge Improvements
Record of Decision 2011

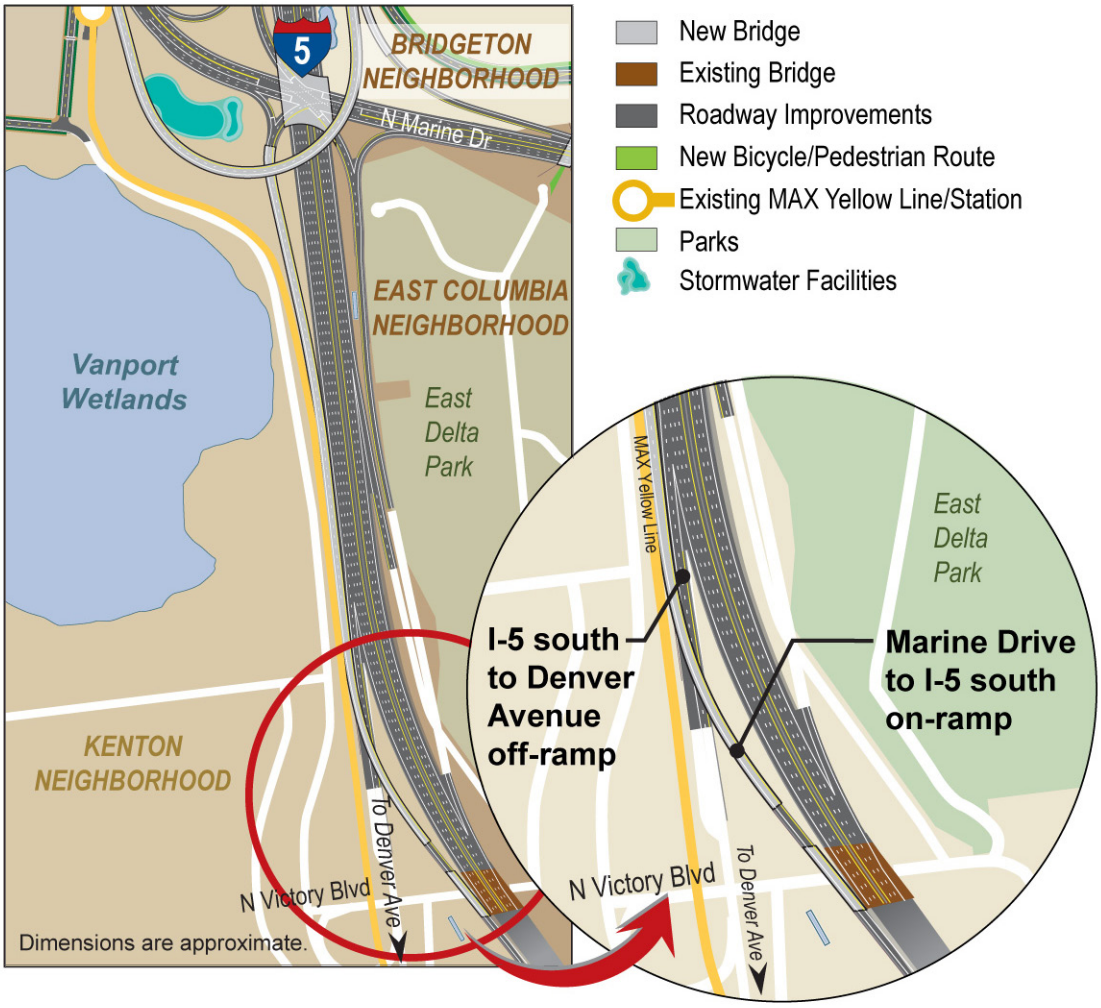


Figure B-4.
Victory Boulevard Interchange Improvements

Record of Decision 2011

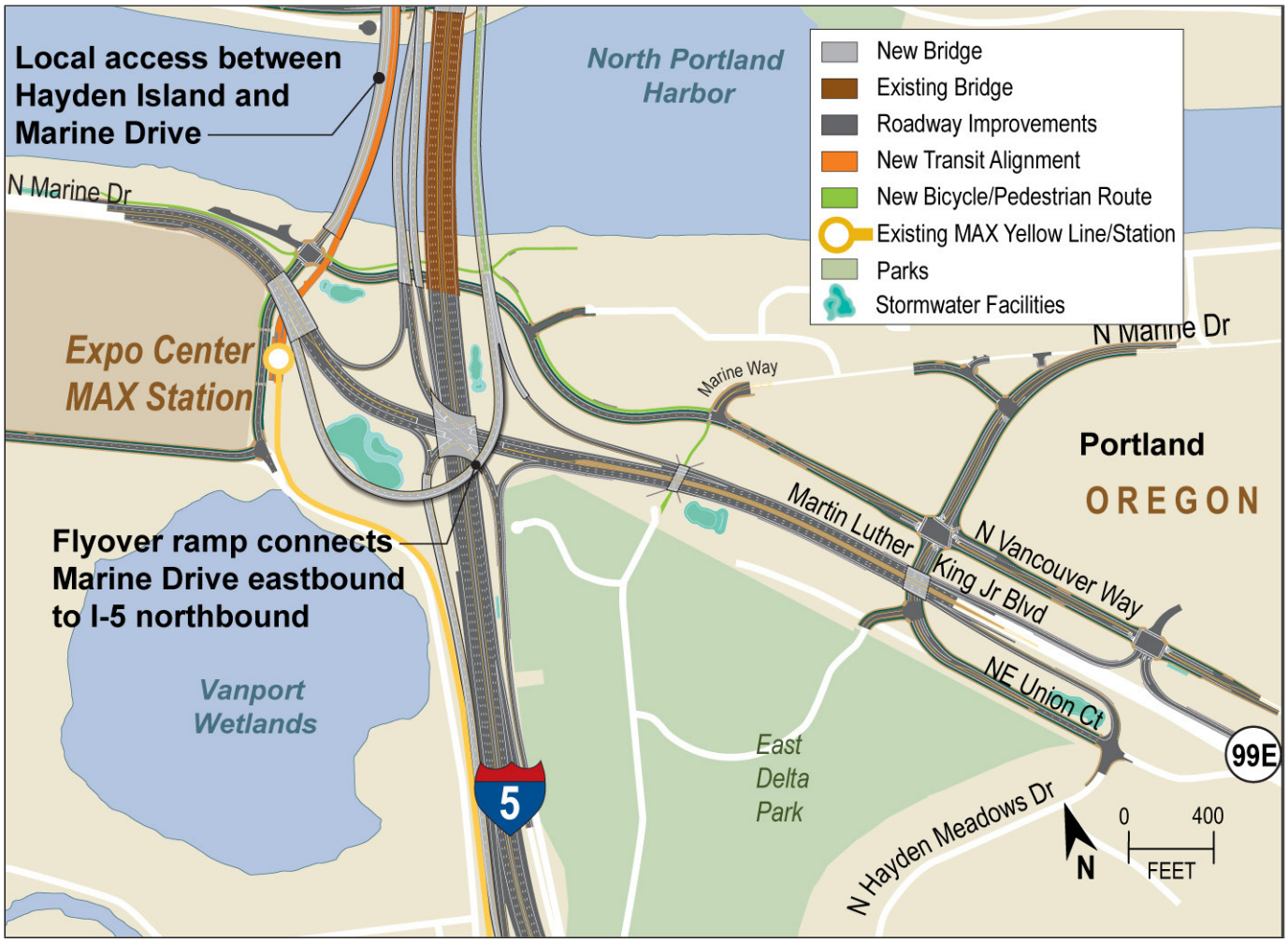
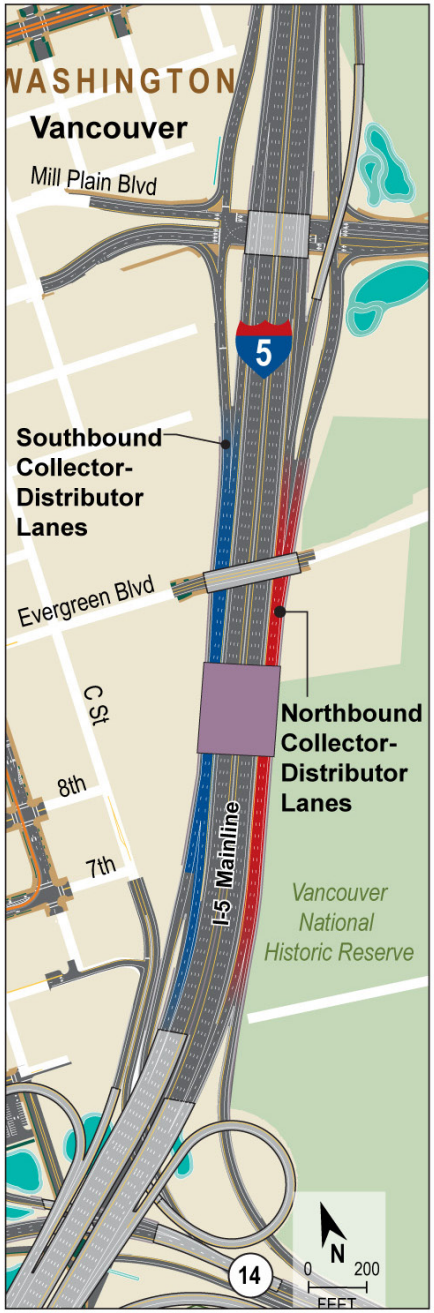


Figure B-5.
Marine Drive Interchange Improvements
Record of Decision 2011



Figure B-6.
Hayden Island Interchange Improvements
Record of Decision 2011



Dimensions are approximate.



Dimensions are approximate.

- New Bridge
- Roadway Improvements
- New Transit Alignment
- New Transit Station
- Community Connector
- New Park and Ride
- New Bicycle/Pedestrian Route
- Sidewalks
- Parks
- Stormwater Facilities
- Planter Strip
- Northbound Traffic
- Southbound Traffic
- New Surface Parking Lot

Figure B-7.
SR 14 Interchange Improvements
Record of Decision 2011



Dimensions are approximate.

Figure B-8.
Mill Plain Boulevard
Interchange Improvements

Record of Decision 2011



Dimensions are approximate.



Dimensions are approximate.

Figure B-9.
Fourth Plain Boulevard Interchange Improvements

Record of Decision 2011



Dimensions are approximate.

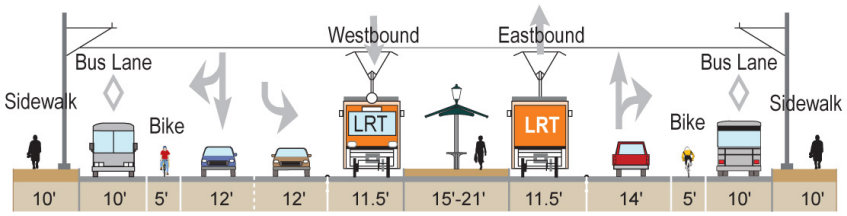
Figure B-10.
SR 500 Interchange Improvements
Record of Decision 2011



Dimensions are approximate.

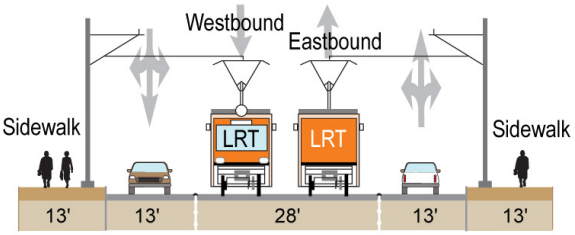
A. Terminus

Station block with center platform
Double track in median and center platform



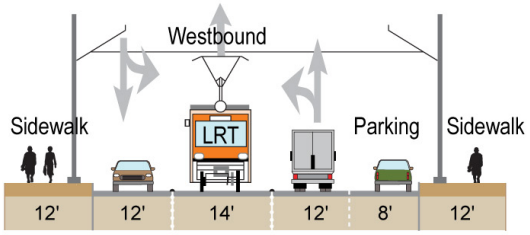
B. 17th Street

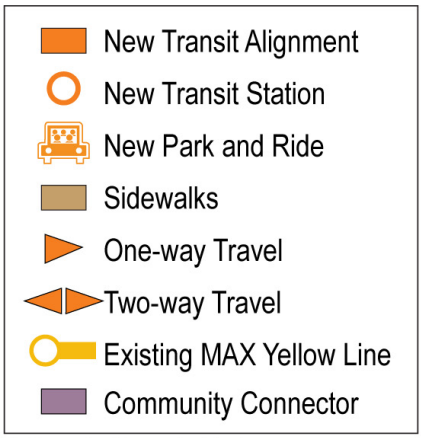
Non-station block
from Broadway to G Streets
Double track in median



C. 17th Street

Non-station block
from Washington to Main
Single track in median with parking lane





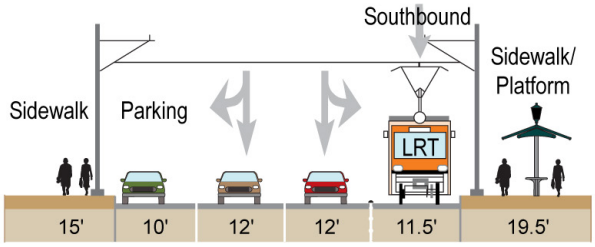
Not to scale. Conceptual designs.

Figure B-11.
Proposed Selected Alternative Transit Alignment and Street Cross Sections (1 of 2)

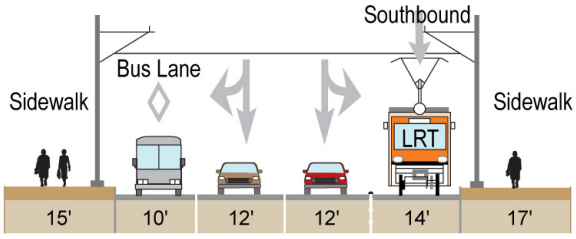
Record of Decision 2011

D. Washington Street

Station block with side platform
Inside single track with one-way traffic
and bus or parking lane (depending on block)

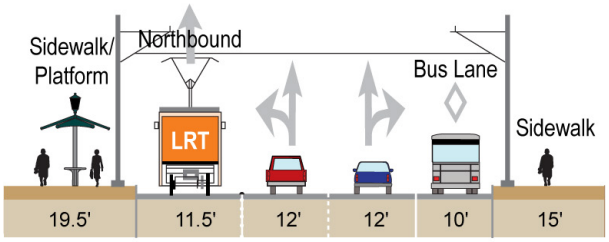


Non-station block
Inside single track with one-way traffic
and bus or parking lane (depending on block)

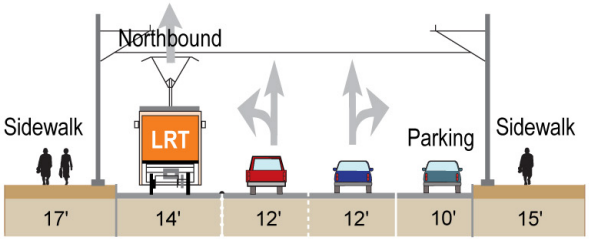


E. Broadway Street

Station block with side platform
Inside single track with one-way traffic
with bus or parking lane (depending on block)

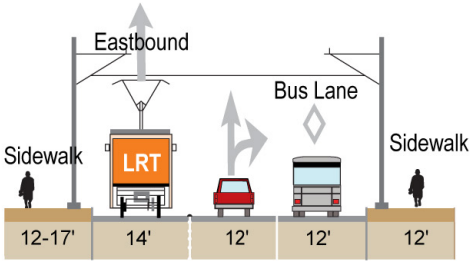


Non-station block
Inside single track with one-way traffic
and bus or parking lane (depending on block)



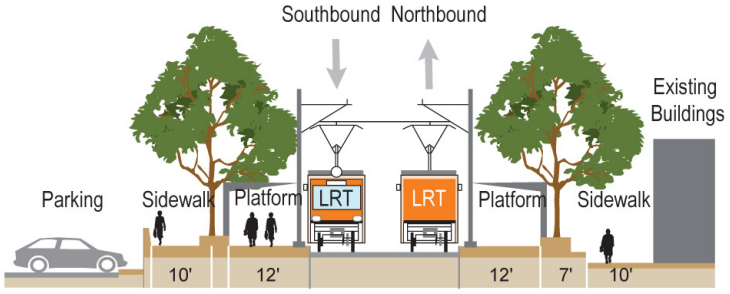
F. 7th Street

Between Washington and Main Streets
Single track with one-way traffic
and bus lane



G. Washington Street

Station block between 5th and 6th
Double track with no traffic



H. Hayden Island

At Tomahawk Island Drive
Elevated station at plaza

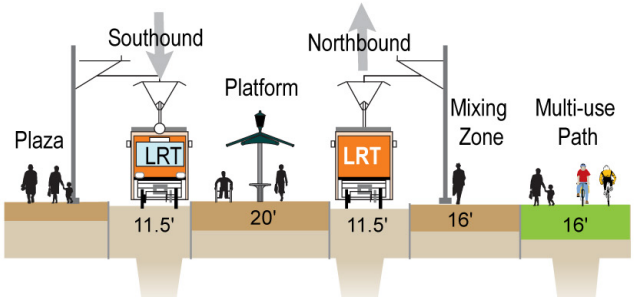
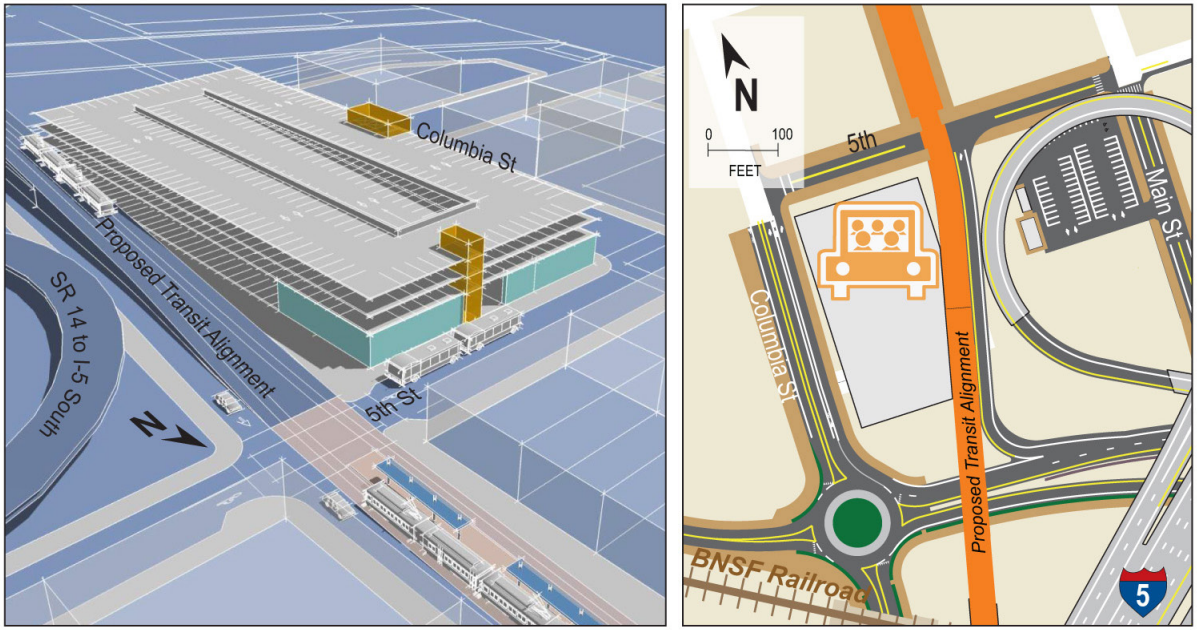


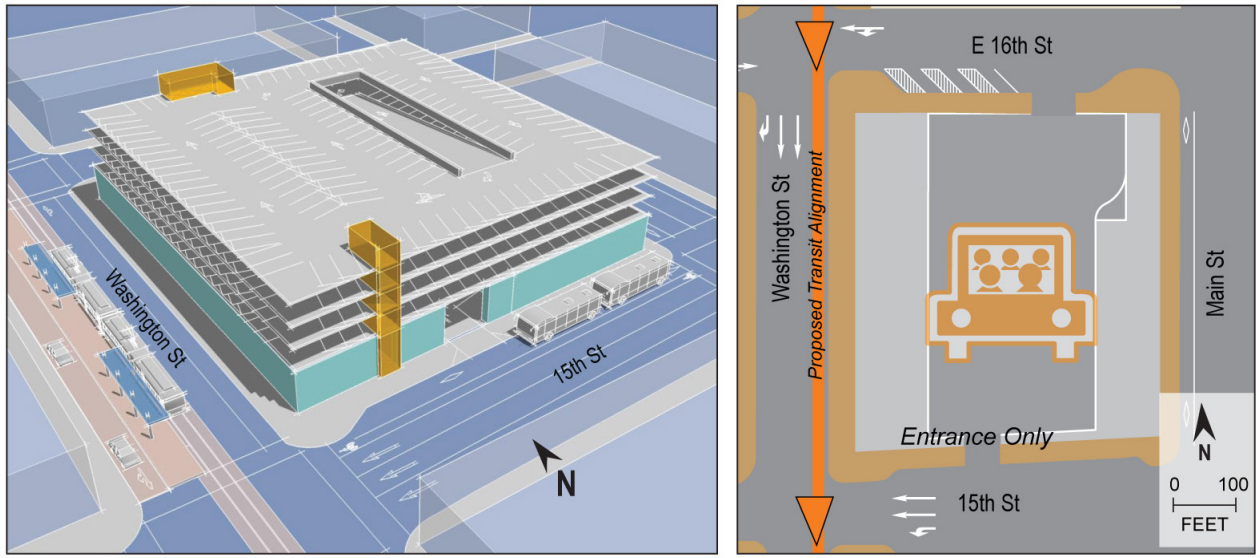
Figure B-11.
Proposed Selected Alternative Transit Alignment and Street Cross Sections (2 of 2)
Record of Decision 2011



Conceptual designs. Dimensions are approximate.

Figure B-12.
Columbia Park and Ride

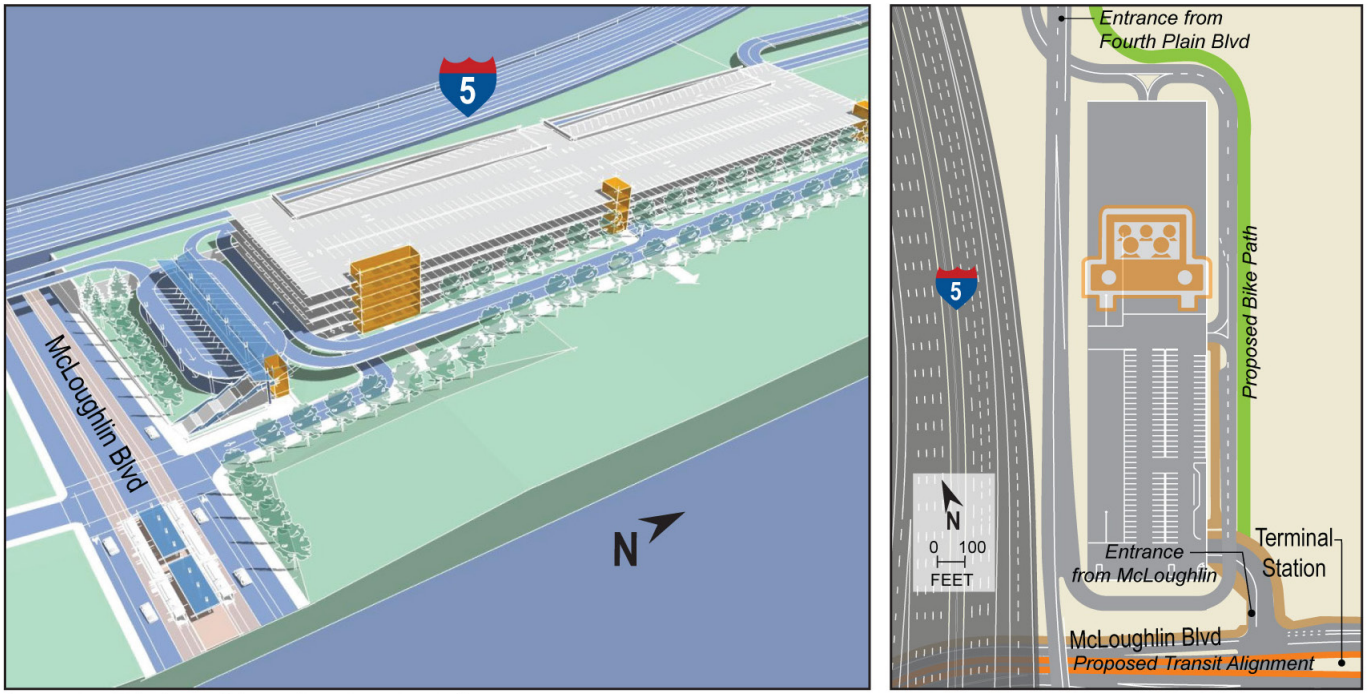
Record of Decision 2011



Conceptual designs. Dimensions are approximate.

Figure B-13.
Mill Park and Ride

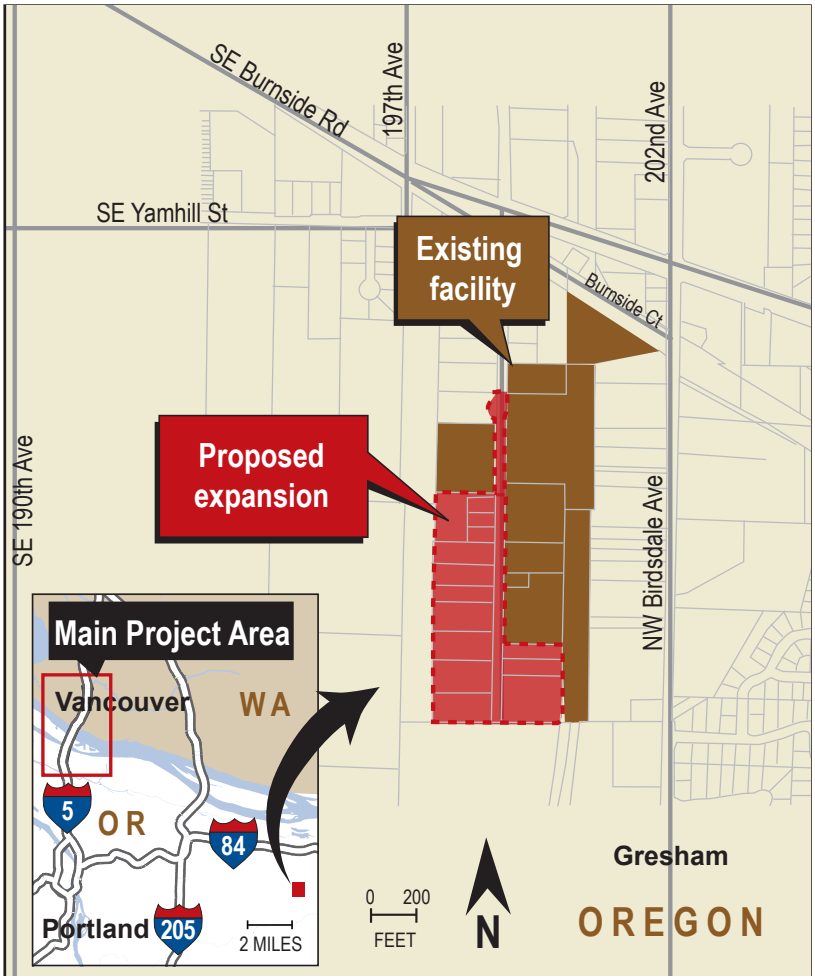
Record of Decision 2011



Conceptual designs. Dimensions are approximate.

Figure B-14.
Clark Park and Ride

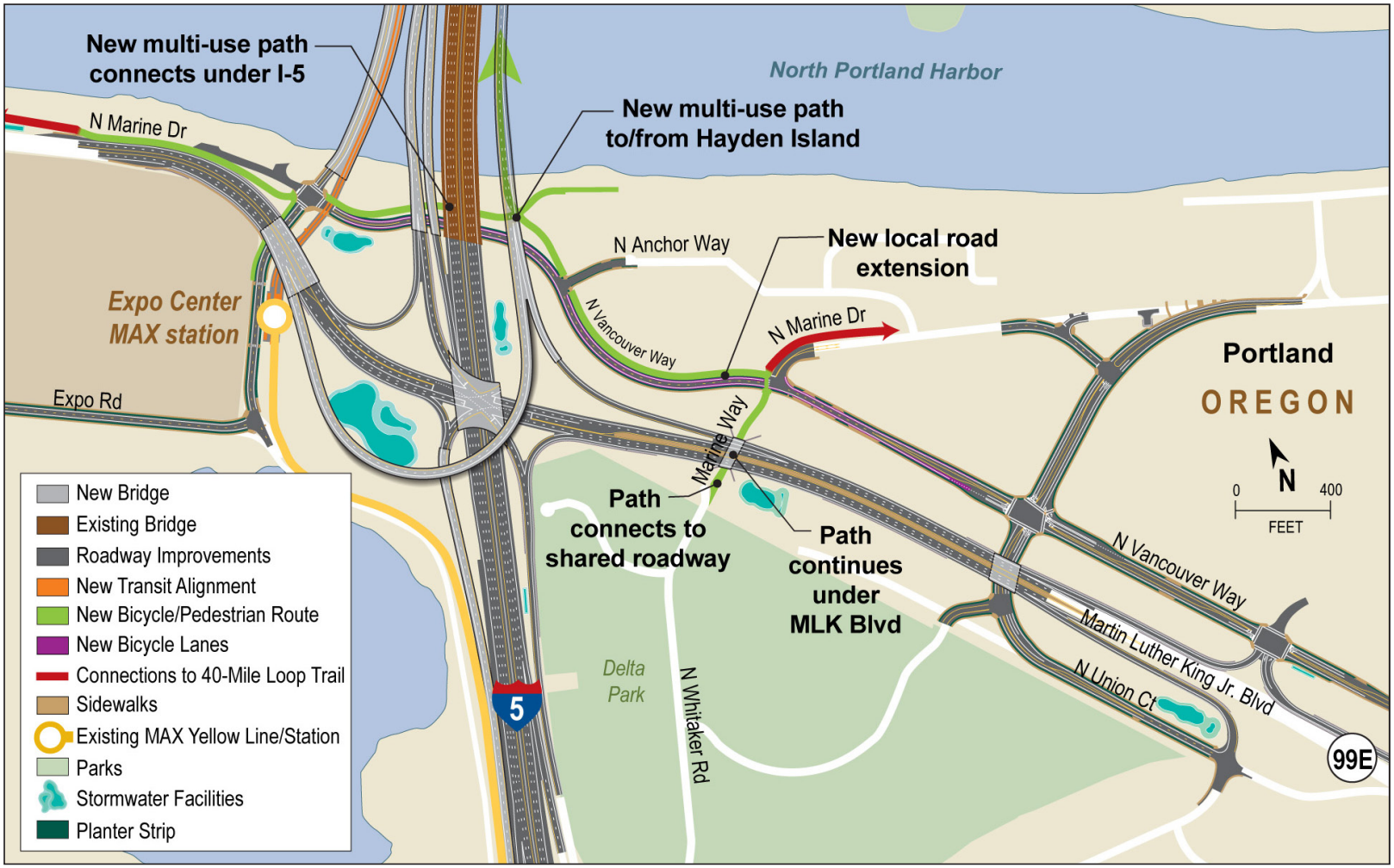
Record of Decision 2011



Dimensions are approximate.

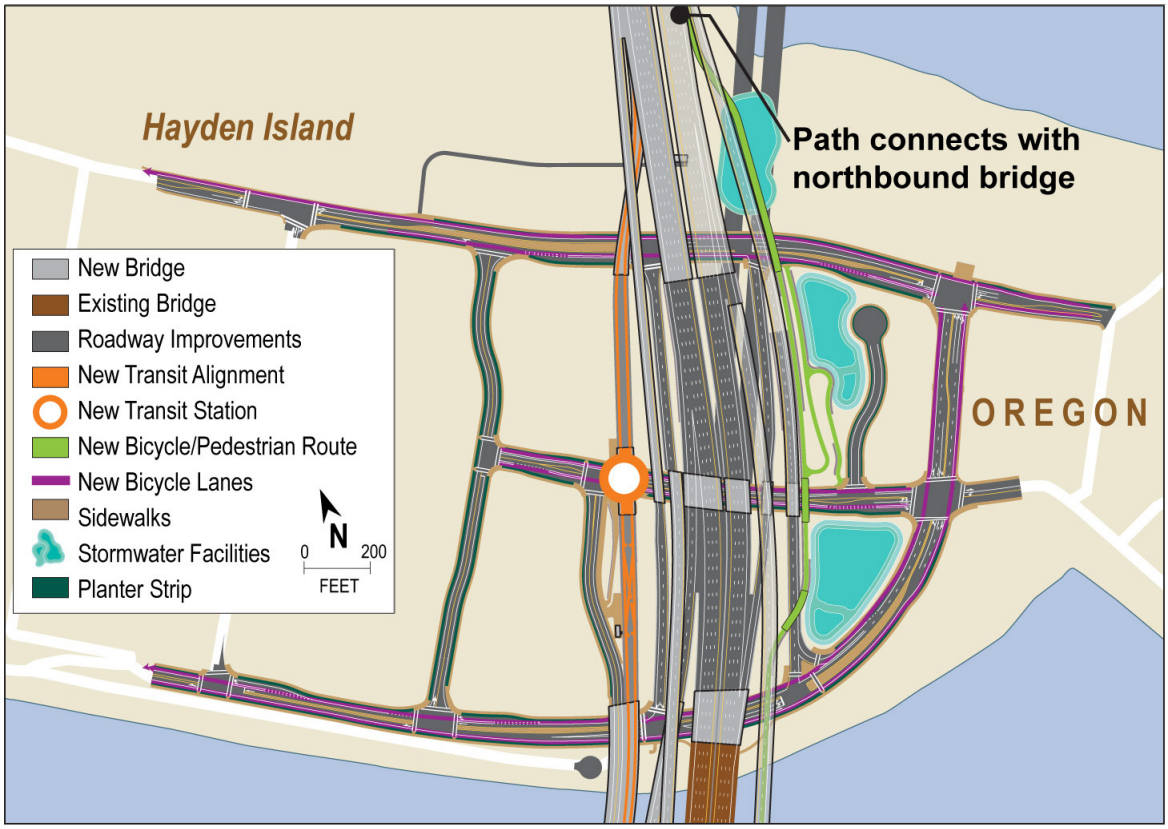
Figure B-15.
Ruby Junction Maintenance Base Facility Expansion

Record of Decision 2011



Dimensions are approximate.

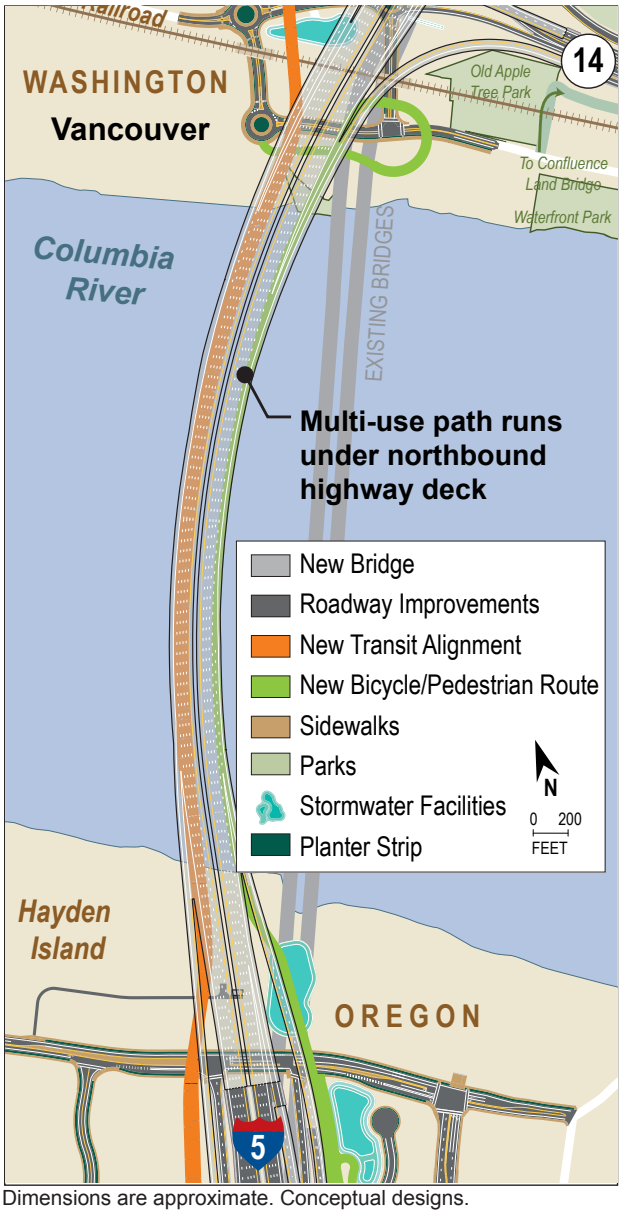
Figure B-16.
North Portland Bicycle and Pedestrian Improvements
Record of Decision 2011



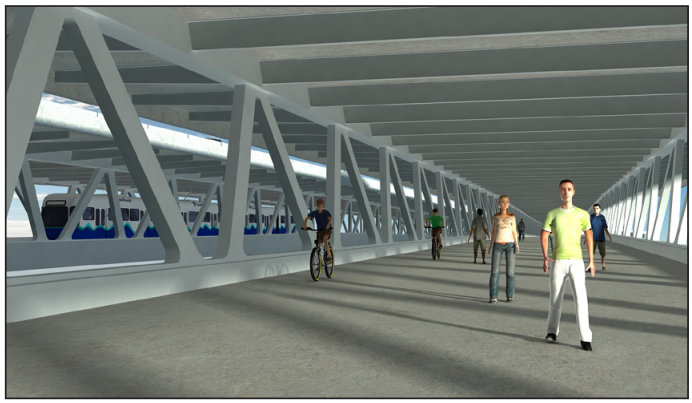
Dimensions are approximate.

Figure B-17.
Hayden Island Bicycle and Pedestrian Improvements

Record of Decision 2011



Dimensions are approximate. Conceptual designs.



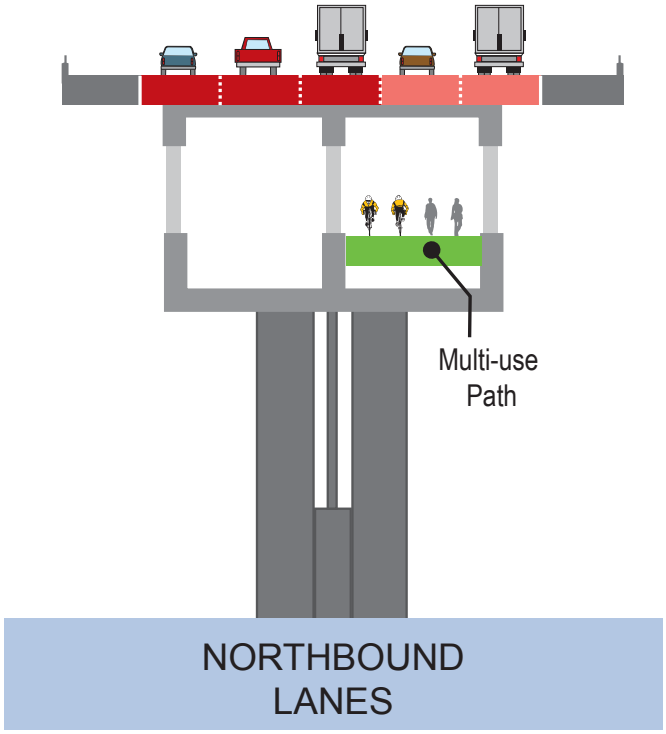


Figure B-18.
River Crossing Bicycle and Pedestrian Improvements

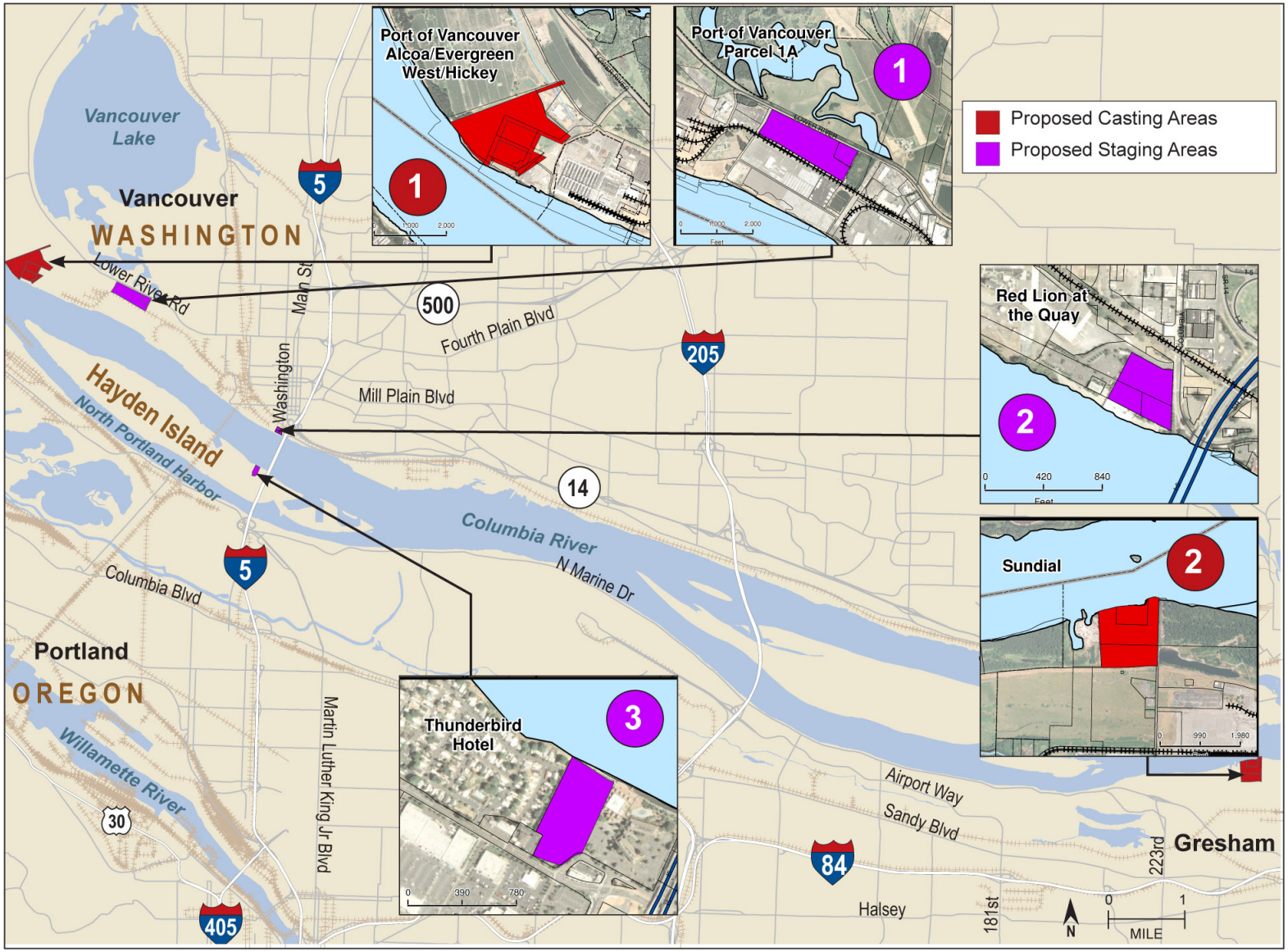
Record of Decision 2011



Dimensions are approximate.

Figure B-19.
Vancouver Bicycle and Pedestrian Improvements

Record of Decision 2011



Dimensions are approximate.

Figure B-20.
Staging Sites and Casting Yards in Relation to Project Area

Record of Decision 2011

APPENDIX C

ANTICIPATED LOCAL, STATE AND FEDERAL PERMITS AND APPROVALS

Appendix C

Anticipated Local, State, and Federal Permits and Approvals

Water Quality, Wetlands and Shoreline
Clean Water Act (CWA) Section 404 Permit
Oregon Removal and Fill Permit
CWA Section 401 Water Quality Certification (Oregon and Washington)
CWA National Pollutant Discharge Elimination System Permit
Rivers and Harbors Act Section 9 Bridge Permit
Rivers and Harbors Act Section 10 Waterway Structures Permit
Rivers and Harbors Act, US Code 33, Section 408 Civil Works Alteration Permit
Sole Source Aquifer Protection Review
Washington Shoreline Management Act Substantial Development Permit
Washington Critical Areas Protection
Washington Construction Stormwater General Permit
Oregon 1200-C Construction Permit
City of Portland Environmental Zone Permit
City of Vancouver Critical Areas Permit
Fish and Wildlife
Endangered Species Act Section 7 Consultation
Marine Mammal Protection Act
Magnuson-Stevens Fishery Conservation Management Act
Migratory Bird Treaty Act
Oregon Endangered Species Act
Washington Aquatic Lands Act
Washington Hydraulic Project Approval
Air Quality
Air Quality Conformity Determination
Oregon Stationary Source Permit
Washington Stationary Source Permit
Hazardous Waste
Voluntary Cleanup Program Approval
Archaeological and Historic Resources
Section 106 Memorandum of Agreement
Historic Property Demolition Permit

Section 4(f)
Section 4(f) Evaluation
Public Utilities
Use and occupancy agreements (if relocated)
Federal Highway Administration Approvals
Several different approvals necessary for I-5 freeway improvements
Parks
Federal Land to Parks
Land and Water Conservation Fund Act
Aviation
FAA Notice of Proposed Construction or Alteration
Land Acquisitions
Federal Land Transfer
Uniform Relocation Assistance and Real Property Acquisitions Policies Act
Oregon Lease/Easement Approval
Washington Lease/Easement Approval
Construction of Transit Stations and Park and Rides
Building Permits
Noise Variance
Sign Permits
Site Plan Approvals
Local Roadways and Traffic Plans
Environmental Conservation Zone Permit
Improvements in Right Of Way
Transportation Management Plan
Temporary Use Permit
Land Use and Growth Management
Metro Land Use Final Order

APPENDIX D

FEIS ERRATA

Columbia River Crossing FEIS Errata and Clarifications

December 2011

The following is a list of errors or points of clarification in the I-5 Columbia River Crossing (CRC) Final Environmental Impact Statement (FEIS) that was released for public review and comment on September 23, 2011. These errata for the Final EIS are printed and included with publication of the Record of Decision.

CHAPTER	PAGE	CURRENT TEXT/REFERENCE	CORRECTED TEXT/CLARIFICATION
Summary	S-35	Chapter 3 and Appendix M of the FEIS provide more detail on proposed mitigation or compensation measures.	Chapter 3 and **Appendix L** of the FEIS provide more detail on proposed mitigation or compensation measures.
3.1 Transportation	3-59	• "Add a third eastbound left turn at the Mill Plain interchange when needed in the future. The third eastbound left-turn lane should be added when eastbound left-turn volumes have increased to a level that causes the interchange to fail to meet acceptable operational standards. Monitor and adjust ramp meter rates at Mill Plain Boulevard on-ramps, if/when these are installed in the future. When queuing from the ramp causes either ramp terminal to fail to meet the operational standard, ramp meter rates should be adjusted. Due consideration, but not equal weight, will be given to the local system to minimize queuing from the ramp meter. Emphasis will be on avoiding significant adverse impacts and traffic operational failures on the freeway system."	This paragraph should be two bullet points: • "Add a third eastbound left turn at the Mill Plain interchange when needed in the future. The third eastbound left-turn lane should be added when eastbound left-turn volumes have increased to a level that causes the interchange to fail to meet acceptable operational standards. • Monitor and adjust ramp meter rates at Mill Plain Boulevard on-ramps, if/when these are installed in the future. When queuing from the ramp causes either ramp terminal to fail to meet the operational standard, ramp meter rates should be adjusted. Due consideration, but not equal weight, will be given to the local system to minimize queuing from the ramp meter. Emphasis will be on avoiding significant adverse impacts and traffic operational failures on the freeway system."
3.2 Aviation and Navigation	3-72	"The project team, in consultation with the USCG and industry representatives, established a vertical minimum of 95 feet clearance for the new bridge, so that the new structure could be built without a lift span."	"The project team, in consultation with the USCG and industry representatives, established a vertical minimum of 95 feet clearance **above 0 on the Columbia River Datum (CRD)** for the new bridge, so that the new structure could be built without a lift span."
3.2 Aviation and Navigation	3-74	"As shown in Exhibit 3.2-4, only marine contractors, which travel this portion of the river infrequently, may have vertical height requirements greater than the available clearance."	"As shown in Exhibit 3.2-4, only marine contractors, which travel this portion of the river infrequently, may have vertical height requirements greater than the available clearance. **In addition, other vessels or loads taller than 86 feet could be seasonally restricted during high water levels.**"
3.11 Noise and Vibration	3-293	**"What City Noise Standards Affect the Project?** The City of Portland has restrictive noise regulations that apply to construction from 7:00 p.m. to 7:00 a.m. and all day on Sundays. The full regulations are given in the City of Portland Municipal Code, Title 18, Noise Control. Under the City's noise control ordinance, virtually all major construction projects require a noise variance if work is planned during nighttime hours or on Sundays."	**"What City Noise Standards Affect the Project?** The City of Portland has restrictive noise regulations that apply to construction from **6:00** p.m. to 7:00 a.m. and all day on Sundays. The full regulations are given in the City of Portland Municipal Code, Title 18, Noise Control. Under the City's noise control ordinance, virtually all major construction projects require a noise variance if work is planned during nighttime hours or on Sundays."

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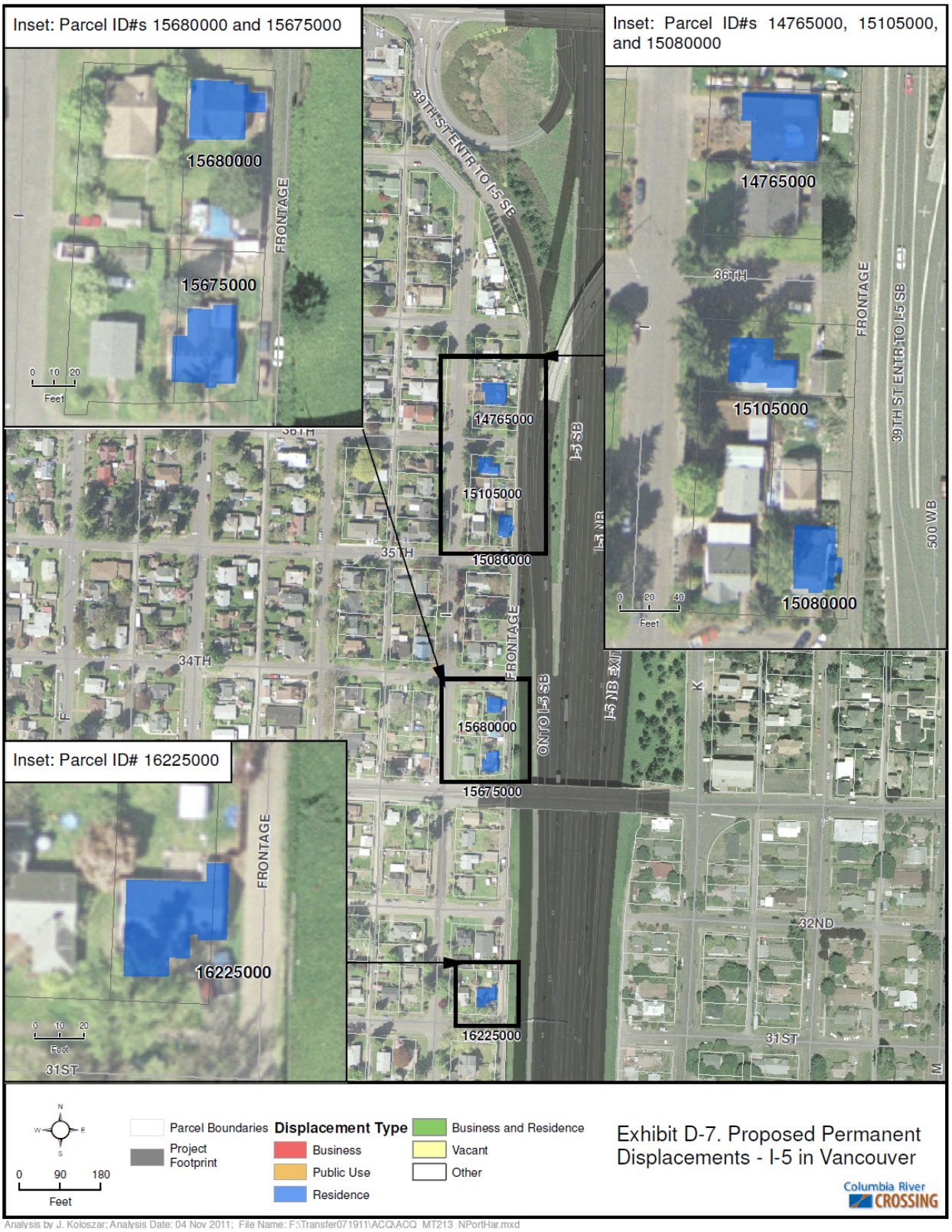
CHAPTER	PAGE	CURRENT TEXT/REFERENCE	CORRECTED TEXT/CLARIFICATION
3.11 Noise and Vibration	3-292, 3-316, 3-317	"ODOT Standard Specifications Section 292.32"	Each occurrence of "ODOT Standard Specifications Section 292.32" should read "**2008 Oregon Standard Specifications for Construction Section 290.32**"
3.14 Water Quality and Hydrology	3-334	The TSSA report is also included as Appendix E of the Hazardous Materials Technical Report.	The TSSA report is also included as Appendix **F** of the Hazardous Materials Technical Report.
3.19 Cumulative Effects	3-434	"**West Hayden Island –** The City of Portland is in the process of developing a concept plan for the Port of Portland–owned West Hayden Island (WHI). The Port requested this planning as part of their proposal for a combination of marine terminal facility development and open space uses on WHI. The Port's conceptual plans for the future development of WHI include an arterial road connection between WHI and Marine Drive as well as rail infrastructure improvements. In this FEIS, the analysis of Hayden Island local roads and the Hayden Island interchange includes estimated auto and truck trips that would be generated by the Port of Portland's proposed WHI marine terminal development. Based on current assumptions regarding the Port's proposed facility, the additional traffic generated would not significantly impact the roadway facilities that would be constructed as part of the CRC LPA Option A or Option B. This is because the marine terminal facilities under consideration rely mostly upon access via barge and railroads, not trucks."	"**West Hayden Island** – The City of Portland **(the City)** is in the process of developing a concept plan for the Port of Portland–owned West Hayden Island (WHI). **The City asked the Port to participate in this planning effort and will consider a** combination of marine terminal facility development and open space uses on **the island**. The **City's** conceptual plans for the future development of WHI **will evaluate** an arterial road connection between WHI and Marine Drive as well as rail infrastructure improvements. In this FEIS, the analysis of Hayden Island local roads and the Hayden Island interchange includes estimated auto and truck trips that would be generated by the Port of Portland's proposed WHI marine terminal development. Based on current assumptions regarding the Port's proposed facility, the additional traffic generated would not significantly impact the roadway facilities that would be constructed as part of the CRC LPA Option A or Option B. This is because the marine terminal facilities under consideration **would largely be served by rail and marine transportation.** **In the event that an additional arterial connection is needed to provide access to the western portion of the island, it is currently reflected in the Financially Constrained portion of the 2035 Regional Transportation Plan.**"
3.19 Cumulative Effects	3-436	"If proposed CRC improvements are not constructed, economic development planned for the area may occur more slowly, as business owners may be more reluctant to locate in an area with poor access and mobility for employees and customers. Customers may elect to shop in other areas with easier access and better mobility."	"If proposed CRC improvements are not constructed, economic development planned for the area may occur more slowly, as business owners may be more reluctant to locate in an area with poor access and mobility for employees and customers. **With increased congestion, existing market areas will decrease thus impacting business competitiveness. The Portland/Vancouver region behaves as a single market benefiting from synergies between two states. Viable connections between southwest Washington and the Portland Metro area are critical to the economy of both Oregon and Washington. For the retail sector,** customers may elect to shop in other areas with easier access and better mobility.
3.19 Cumulative Effects	3-459	"For example, bridge construction activity for this project will need to be coordinated with other in-water work that could occur simultaneously, such as the Columbia River Channel Deepening project, as well as with construction immediately	"For example, bridge construction activity for this project will need to be coordinated with other in-water work that could occur simultaneously, such as the **maintenance dredging on the Columbia River or North Portland Harbor**, as

CHAPTER	PAGE	CURRENT TEXT/REFERENCE	CORRECTED TEXT/CLARIFICATION
		adjacent to the project, such as the Riverwest project."	well as with construction immediately adjacent to the project, such as the Riverwest project."
Appendix L, Mitigation Matrix	L-7	"Mitigating circumstances include project support for redevelopment through: *Provision of light rail station *Completion of Tomahawk Island Drive *Addition of direct access to island"	This text should be removed. These items are not listed mitigation.
Appendix L, Mitigation Matrix	L-1	Column headers	There should be a key that clarifies that in the column "L/T", "L" refers to long term and "T" refers to temporary. The column "Cert" refers to certainty of the impact occurring, "1" being most certain and "3" being least certain.
Navigation Technical Report	5-4	A clarification on assumptions of bridge design was omitted.	The following paragraph should be inserted after the bullet points: **"It is important to note that the clearance estimates in Exhibit 5-2 for marine contractors and high mast sailboats are based on a bridge design that uses haunched trusses, in which the trusses are thinner near the center of their spans and gradually thicker toward either end of the span. This results in higher vertical clearance near the center than toward the sides of the navigation channel passing under the bridge span. If the trusses are not haunched, then the vertical clearances would be generally uniform across the span, and all vessels or loads (whether barges, contractors or sail boats) taller than 86 to 88 feet but not taller than 90 to 94 feet (depending on the year) would only be able to pass under the bridge during parts of the year. For a bridge with non-haunched trusses, seasonal clearance for all vessels would be essentially the same as shown for tugs and tows in the first graph in Exhibit 5-2."**
Navigation Technical Report	5-6	"Cranes typically used by marine contractors may not be able to pass under the bridge year round. However, the Boat Survey indicated that Marine Contractor vessels travel under the Interstate Bridges infrequently and, in the future, it may be possible for them to lower or disassemble crane gantries, reducing their height meet clearances."	"**Large** cranes used by marine contractors may not be able to pass under the bridge year round. However, the Boat Survey indicated that Marine Contractor vessels travel under the Interstate Bridges infrequently and, in the future, it may be possible for them to lower or disassemble crane gantries, reducing their height **to** meet clearances."

The following preparer of the FEIS was omitted from Appendix H, List of Preparers:

Name, (Registration)/ Affiliation	Project Role	Education	Years of Experience
John Replinger, PE/DEA	**Author, Traffic Technical Report, Transportation Demand Management and Transportation System Management Technical Report**	**BS, Civil Engineering** **BA, Liberal Arts and Sciences**	**37**

This following Exhibit was omitted from the Property Acquisitions and Displacements Technical Report. This information was included in Exhibit 3.3-4 on page 3-87 of FEIS Section 3.3 Property Acquisitions and Displacements.



Analysis by J. Koloszar; Analysis Date: 04 Nov 2011; File Name: F:\Transfer071911\ACQ\ACQ_MT213_NPortHar.mxd

Appendix E

Comments Received on the Final EIS and Responses

The CRC project included a 30-day review period for the Final Environmental Impact Statement (FEIS), which began with publication of the FEIS on September 23, 2011, and concluded on midnight of October 24, 2011, including all mailed comments post-marked by October 24 at midnight. During the review period, the CRC project received a total of 134 submittals with substantive comments on the FEIS submitted through a variety of means, including by letter, comment form and email. Each of these submittals, with responses by the Federal Highway Administration and Federal Transit Administration, are included electronically in this appendix.

To view the individual comments and responses, please click on the Appendix E folder on this CD, and then click on the file named "index.html." The comments are organized first by commenter type (federal, state and local agency; Tribe; CRC advisory group; neighborhood association; business association; non-governmental organization; business; and public) and then by the comment number. To view a specific comment and response, simply click on the name of the commenter from the list.

Appendix E - Comments Received on the Final EIS and Responses

	File Name
	Instructions.pdf

Federal Agency	Full PDF
Item Code	**Item Name**
F-001	EPA
F-002	U.S. Coast Guard

State Agency	Full PDF
Item Code	**Item Name**
S-001	WA State Recreation and Conservation Office
S-002	WA State Department of Ecology
S-003	OR Department of Environmental Quality

Local Agency	Full PDF
Item Code	**Item Name**
L-001	Portland Bureau of Transportation
L-002	North Portland Neighborhood Services
L-003	Metro

Tribe	Full PDF
Item Code	**Item Name**
T-001	The Confederated Tribes of the Grand Ronde Community of Oregon

CRC Advisory Group	Full PDF
Item Code	**Item Name**
G-001	Urban Design Advisory Group

Neighborhood Association	Full PDF
Item Code	**Item Name**
N-001	Bridgeton Neighborhood Association 1
N-002	Bridgeton Neighborhood Association 2
N-003	Hayden Island Neighborhood Association
N-004	Portland's Directly Impacted Neighborhoods
N-005	East Columbia Neighborhood Association
N-006	Howton, Brad

Business Association	Full PDF
Item Code	**Item Name**
A-001	Lenny Anderson, Swan Island Business Association
A-002	Travel Portland, Jeff Miller

Non-Governmental	Full PDF: 1 2

Item Code	Item Name
O-001	Pacific Environmental Advocacy Center
O-002	Pacific Environmental Advocacy Center
O-003	Hayden Island Livability Project
O-004	Hayden Island Manufactured Home Community
O-005	Hayden Island Enterprises
O-006	Mayfield Management Company

Business	Full PDF: 1 2 3
Item Code	**Item Name**
B-001	Buena - Hayden LLC
B-002	Diversified Marine Incorporated
B-003	Historic Lucky Lager Warehouse
B-004	Rumble, Newt
B-005	Jubitz Corporation

Public	Full PDF: 1 2 3 4 5 6 7 8
Item Code	**Item Name**
P-001	Anonymous 1
P-002	Anonymous 2
P-003	Anonymous 3
P-004	Anonymous 4
P-005	Anonymous 5
P-006	Anonymous 6
P-007	Anonymous waave@msn.com
P-008	Antonio, Cecilia
P-009	August, Mary
P-010	Bahr, Rex
P-011	Buss, Jesse
P-012	Dean, Robert 1
P-013	Dean, Robert 2
P-014	Dean, Robert 3
P-015	Dean, Robert 4
P-016	Dennis
P-017	G, Joe
P-018	Goberman, Pavel
P-019	Hankins, Brennen
P-020	Johnson, Walter
P-021	Kachold, Herman
P-022	Lewellan, Art
P-023	Moewe, Richard
P-024	Molstead, M
P-025	Nussbaum, Fred 1
P-026	Nussbaum, Fred 2
P-027	Parker, Terry
P-028	Peterson, Debbie
P-029	Peterson, Kevin 1
P-030	Peterson, Kevin 2

P-031	Rivers, Ann
P-032	Simons, Hall
P-033	Sweeney, John
P-034	Warberg, Louise
P-035	Wilhelm, George
P-036	Abernathy, Helena
P-037	Allen, Douglas
P-038	Bafus, George
P-039	Baker, Natalie
P-040	Becker, Kenneth
P-041	Boulanger, Todd
P-042	Boyle, Sharon
P-043	Buehler, Ted
P-044	Buel, Ron 1
P-045	Buel, Ron 2
P-046	Clark, Bob
P-047	Cortright, Joe
P-048	Couch, Tiffany
P-049	Coursey, Daniel and Margaret
P-050	Dana, Tom
P-051	Durrell, Mark
P-052	Eichler, John
P-053	Fox, Gerald
P-054	Ghormley, Dennis
P-055	Halverson, Brad
P-056	Hoyer, Daniel
P-057	Johnson, David
P-058	Leslie, Jerry
P-059	Mabry, Doug
P-060	Madore, David1
P-061	Madore, David2
P-062	Madore, David3
P-063	Madore, David4
P-064	Madore, David5
P-065	Madore, David6
P-066	Madore, David7
P-067	Madore, David8
P-068	Madore, David9
P-069	Madore, David10
P-070	Madore, David11
P-071	Martin, Thomas
P-072	Meunier, Kathleen
P-073	Meunier, Kelly1
P-074	Meunier, Kelly2
P-075	Nasset, Sharon1
P-076	Nasset, Sharon2
P-077	Nasset, Sharon3
P-078	Nasset, Sharon4
P-079	Nasset, Sharon5

P-080	Nasset, Sharon6
P-081	Nasset, Sharon7
P-082	Nasset, Sharon9
P-083	Nasset, Sharon10
P-084	Neerman, Andrew
P-085	Patella, Lawrence
P-086	Peters, Jimme
P-087	Peterson, Debbie
P-088	Potter, Daniel
P-089	Riley, Brian
P-090	Robinowitz, Mark
P-091	Speelman, Harry
P-092	Stevescare
P-093	Swaren, Ron
P-094	Szporluk, Michael
P-095	Teller-Brown, Savannah
P-096	Thomas, Richard
P-097	Tice, Robert
P-098	Turlay, Stephanie
P-099	Tweet, Douglas
P-100	Tweet, Margaret
P-101	Viets, Victor
P-102	Wentzel, Mike
P-103	Marsh, James
P-104	Valenta, Walter
P-105	McCaulley, Jay

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OFFICE OF
ECOSYSTEMS, TRIBAL AND
PUBLIC AFFAIRS

October 24, 2011

Mr. John McAvoy, PE, Major Projects Manager
Federal Highway Administration
Western Federal Lands Building
610 E. 5th St.
Vancouver, Washington 98661

Ms. Linda Gehrke, Deputy Regional Administrator, Region 10
Federal Transit Administration
915 Second Avenue, Suite 3142
Seattle, Washington 98174

Re: Interstate 5 Columbia River Crossing Project Final Environmental Impact Statement
EPA Project Number: 05-052-FHW

Dear Mr. McAvoy and Ms. Gehrke:

F-001-001

The U.S. Environmental Protection Agency (EPA) has reviewed the Interstate 5 Columbia River Crossing Project Final Environmental Impact Statement (FEIS) and Final Section 4(f) Evaluation. We are submitting comments in accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act.

The Columbia River Crossing (CRC) FEIS identifies the locally preferred alternative (LPA) as a refined version of Alternative 3 in the Draft EIS. The LPA includes a new river crossing over the Columbia River, improvements to seven interchanges, bicycle and pedestrian improvements, light rail transit from Portland to Clark College in Vancouver with transit stations, park and rides, bus route changes, an expanded light rail maintenance facility, tolls on motorists for project financing and as a travel demand management tool, and transportation demand and system management (TDM and TSM) measures. Depending on project funding, the LPA could be constructed fully or with phasing of several highway elements.

At the Draft EIS stage, we expressed our general support for the proposed project, particularly with respect to its multi-modal features, use of tolls and other TDM and TSM measures to reduce single occupancy vehicle travel and its associated impacts. We also raised concerns with respect to a number of environmental, human health, social, and economic issues, including potential impacts to the Troutdale Sole Source Aquifer and other project area groundwater resources; air quality; environmental justice and impacts to disadvantaged and vulnerable populations; water quality, impaired water bodies, and subsistence fishing uses; land use; and ecological connectivity. We also reviewed and commented on the project financial analysis and potential funding impacts. We would like to express our appreciation for all the good work that has transpired since the Draft EIS was issued, and to thank you for working with

1

F-001-001

Thank you for your comments.

F-001-001 us to improve the analysis and disclosure of and mitigation for potential project impacts. Our comments regarding specific aspects of the project are provided below.

Groundwater and the Troutdale Sole Source Aquifer

F-001-002 The FEIS together with the pertinent electronic Technical Reports and Appendices (Geology and Soils, Water Quality and Hydrology, Hazardous Materials and its Appendix F, the Troutdale Sole Source Aquifer Report [mis-referenced as Appendix E in the FEIS, p. 3-334 and elsewhere]) do a good job of presenting available data, potential impacts, and description of proposed monitoring. We recommend that these groundwater-related documents, any updates to them and any new reports, be compiled and made readily visible and available to the public on an ongoing basis throughout project design, construction, and beyond.

The CRC project is currently working with the EPA at test shaft drilling sites to ensure that appropriate subsurface soil and groundwater samples are taken to determine the presence of contaminants where pile driving and shaft drilling would occur. We note the following future groundwater-related activities identified in the FEIS that would benefit from clarification and more specific commitment in the Record of Decision (ROD):

- Focused site assessments for hazardous materials (p. 3-423) would be conducted prior to construction to evaluate existing impacts to soil, sediment, and groundwater. An agency approved work plan would have goals, objectives, and procedures for each site assessment.
- An analysis of impacts to groundwater movement due to project construction of shafts, piles, retaining walls and soil stabilization structures, which are projected to be minor and localized (p. 3-409), is deferred to future evaluation as project design proceeds.
- Ongoing drinking water supply monitoring of groundwater by the City of Vancouver will help to verify that the project does not impact Vancouver's drinking water supply (p. 3-424).

Recommendations:

- Identify the specific agency that would approve the focused site assessment for hazardous materials. Identify who would be notified of any hazardous materials discoveries and the response plan chain of events.
- Indicate where the analysis of impacts to groundwater movement can be obtained or reviewed by the public.
- Disclose any other means or plans to monitor groundwater drinking water supplies that may be affected by project construction and operations.
- Compile and make readily available to the public, on an ongoing basis, all groundwater-related reports/documents as stated above.

Air Quality

F-001-003 Cumulative, Long-Term Construction Impacts: We agree with the statement in the FEIS that construction impacts to the surrounding environment are a concern for any of the build alternatives (p. 2-68). The FEIS states that the highest potential for "temporary" cumulative construction impacts, such as local traffic congestion and rerouting, noise and air pollution, is likely near the bridge landing in

2

F-001-002

The DOTs commit to the following mitigation measures and are including them in the Record of Decision:

- Focused Environmental Assessment's (FEAs) would be reviewed and approved by the state DOT hazardous material departments within each respective state (Oregon and Washington). These FEAs will be conducted in areas not covered by Environmental Site Assessments (ESA) Phase 1 or Phase 2 assessments and will address the potential to encounter hazardous materials at specific sites, impacts of construction on hazardous materials and any hazardous materials discoveries. As part of the FEA work plan the DOT hazardous materials departments will coordinate with ODEQ, WDOE and/or EPA on any hazardous materials discoveries and implement the response plan.
- All project reports, analysis and plans are available and will continue to be available on the Columbia River Crossing website.
- The City of Vancouver presently monitors drinking water, this information can be compiled and made available to the public either through the CRC website or the City of Vancouver website. During project construction the FEA work plan will address the potential to encounter hazardous materials at specific sites, impacts of construction on hazardous materials and handling any hazardous materials discoveries. Post project construction completion stormwater infiltration facilities will be designed to provide the necessary separation between the bottom of the basin and seasonal high of the groundwater table to minimize any potential of groundwater contamination.

F-001-003

Although construction will last more than 5 years, project construction activities at any one site are not expected to last more than 5 years. Thus, a CO hot-spot analysis was not conducted. If, as more information

F-001-003

Vancouver and on Hayden Island, where other large construction projects are likely and where CRC construction duration and intensity will be high (p. 3-460). Based on the substantial levels of uncertainty regarding the nature, extent, costs, and delays associated with hazardous materials sites discovery and clean up, historical/cultural/archeological discoveries, project financing, construction phasing, overlapping non-CRC activities/construction in the project vicinity (p. 3-459), and other unforeseen construction impacts and delays, we would expect project construction, and its associated array of impacts, to exceed a five year period.

With respect to air quality, this is significant when one considers the threshold used in the conformity rule. Under the transportation conformity rule, "Temporary increases are defined as those that occur only during the construction phase and last five years or less at any individual site" 40 CFR 93.123(c)(5). The conformity rule does not consider construction periods more than five years as temporary.

The Portland Air Toxics Assessment identified construction activities as a significant source of air toxics in the urban area. In the case of the CRC project, construction of new bridges, roadways, interchanges, light rail transit, bicycle/pedestrian facilities, retaining walls, sound walls, bridge removal, and operations in staging areas all individually or cumulatively can be significant sources of regulated pollutants and air toxics. The best case scenario for duration of project construction is six years, with the Hayden Island and southern Vancouver communities experiencing the most prolonged and intense construction activities. In addition, Subarea 2, which includes the southern Vancouver neighborhoods, is projected to experience higher levels of operational air pollutants (carbon monoxide and nitrogen oxide) with the Locally Preferred Alternative (LPA) than under the No Build Alternative due to greater vehicle miles traveled (p. 3-279). The long-term construction emissions and other construction-related stressors, in addition to elevated long-term or permanent operations emissions (even if lower than current emissions) point to the importance of identifying sensitive receptors, particularly those exposed to these long-term impacts, and to using additional emissions controls for construction equipment project-wide, and particularly within the core construction areas.

Recommendations:

- Identify project area sensitive receptor locations in the ROD and ensure that mitigation commitments address these areas.
- Include commitments for additional emissions controls for construction equipment in the Record of Decision (ROD). There is substantial local evaluation of emission control technologies for construction equipment. This year the City of Portland completed two EPA Diesel Emission Reduction Act grants wherein they successfully installed 156 after-treatment devices and 157 direct-fired heaters as an idle reduction strategy on public and private construction equipment. Contact Kyle Diesner, City of Portland, at 503-823-4166 for more information.
- Require retrofitting of construction equipment in construction contracts. U.S. DOT CMAQ money can be used to help fund diesel retrofits and there are many examples of construction retrofit contract language across the Country.
- See the Clean Construction USA website at http://www.epa.gov/otaq/diesel/construction/ for many examples of construction mitigation measures, case studies, and examples of institutional arrangements for implementing this mitigation.

3

is known, construction at any one staging site is expected to last more than 5 years, a hot spot analysis will be completed.

Sensitive receptors were not explicitly identified in the FEIS, as CRC did not conduct modeling for the FEIS. However, results from the latest Portland Air Toxics Solutions (PATS) modeling, were incorporated into the FEIS. Concentration contours for benzene, formaldehyde and diesel PM were presented for the on-road sources and for on- and off-road mobile source categories. These contours provide the public with information about the spatial distribution of these pollutants across the region and in the project area.

As described in more detail in Chapter 3 (Section 3.10) of the FEIS, construction mitigation will focus on controlling dust and exhaust emissions from demolition and construction activities and on minimizing traffic congestion. Regarding dust, the project will comply with WAC 173-400-040 in Washington and Section 290 of ODOT's standard specifications in Oregon, regulations that limit dust emissions. The WAC includes enforcement actions and fines in cases where dust becomes a nuisance and Section 290 includes a list of precautions to be taken to avoid dust emissions.

Regarding exhaust emissions, the contractor would be required to develop a pollution control plan that includes documentation of operational measures that would be used to reduce emissions. This plan would include a requirement for the use of ultra low sulfur diesel and idling location and duration limitations. In addition, the DOTs are evaluating potential additional emission control technologies for construction equipment. The DOTs will continue to monitor and evaluate changes in technology and related regulations. Decisions regarding any additional emission controls will be made during final design.

Stationary sources such as concrete and asphalt mix plants are

F-001-003

- Commit to a full suite of air quality construction mitigation measures to avoid and minimize construction-related emissions to the extent possible.
- Include in the ROD a commitment that WSDOT and ODOT will continue to work with neighborhoods and vulnerable populations to address air quality concerns and impacts as the project moves into final design and construction.

Environmental Justice – Cumulative Effects to Disadvantaged and Vulnerable Populations

F-001-004

We acknowledge and appreciate the benefits associated with the proposed project, and we appreciate the efforts to minimize impacts to disadvantaged populations in the project area through outreach and incorporation of community input. We do remain concerned that the direct and indirect environmental, human health, social, and economic project impacts would likely affect disadvantaged populations within the project area disproportionately as compared to populations that reside outside the project area. It is important to acknowledge that the same project benefits accrue to non-disadvantaged communities outside the construction zone, but without the impacts, or in the case of regressive tolls, with less impact. Also, the general approach to analyzing and mitigating individual impacts, while important and useful, may not fully illuminate and enable a response to the holistic social, cultural, economic, and human health effects that may result from cumulative impacts.

We continue to recommend that available health data be provided to help characterize baseline conditions in affected neighborhoods and to inform efforts to mitigate impacts. The CRC Office indicates that maps of asthma rates and accompanying data and explanation could be provided, but that since the project is having no adverse impact on air quality, there is little need to discuss the potential for disproportionate or adverse effects. We believe this health information should be disclosed and used in describing cumulative effects to vulnerable populations, and applied in project planning and design to reduce impacts throughout the project area, whether or not a community has voiced concern regarding air pollution or other potential project-related impacts. The cumulative effects analysis should recognize that all project-related impacts, whether social, economic, or environmental, have potential impacts to human health and well-being.

We suggest considering augmentation of the mitigation listed for CRC tolling impacts. Allowing disadvantaged people to use their electronic benefit cards (food stamp funds) to purchase transponders and pay tolls is a convenience, but is essentially a decrease in their public assistance funds. Considering the scope of current and additional impacts being borne by the affected neighborhoods and the current economic struggles, it would seem appropriate to offer low income residents free or discounted transponders and free or reduced fare transit passes.

Recommendations:

- Include baseline health data in the ROD, and use it to inform further mitigation commitments.
- To alleviate cumulative effects from past, current, and additional future impacts, consider remedies that are social, economic, and environmental in nature, result in reduced stress, and improve the quality and enjoyment of life in cumulatively affected communities.
- Consider providing free or discounted transponders and transit passes to low income residents.

4

generally required to obtain air permits from DEQ or SWCAA and to comply with regulations to control dust and other pollutant emissions. As a result, their operations are typically well controlled and do not require additional project-specific mitigation measures.

Strategies to minimize the occurrence and effect of roadway congestion during construction would be developed during the design phase. Alternatives would be refined, impacts to traffic analyzed, and transportation agencies and experts brought in to develop mitigation plans and solutions. Some of these strategies may include encouraging mode shifts to non-SOV trips, construction management techniques/incentives to avoid/reduce congestion, and providing information to travelers to encourage alternate route/travel times.

WSDOT and ODOT will continue to work with neighborhoods and vulnerable populations to address air quality concerns and impacts as the project moves into final design and construction.

F-001-004

The project will work closely with the affected neighborhoods for the duration of construction, and beyond. As part of this outreach, and fulfilling federal and other guidance on environmental justice, the project will acknowledge and address unique vulnerabilities throughout the community. The FEIS includes mitigation to conduct outreach on tolling in multiple languages, to work closely with the State Schools for the Blind and the Deaf in Vancouver, and to actively manage construction related emissions, dust, and other impacts. The mitigation commitments have been updated to include specific work to identify and help mitigate effects that are specific to individuals with health problems or other unique circumstances. It is not possible, without an independent survey and analysis being initiated, to isolate health conditions and affects within the study area specifically. Instead the project will incorporate into its outreach and public involvement programs, a specific emphasis on

F-001-005

Phased Implementation. Because the CRC project construction may be phased the EIS should acknowledge that, at some point, "temporary" impacts should be considered long term or permanent impacts depending on the nature and duration of effects. Conformity rules under the Clean Air Act identify impacts as temporary only if they last 5 years or less. The question of whether or not this finding should also apply to impacts regarding vulnerable populations, noise, water quality, threatened and endangered species, and so on should be examined.

Long term social, economic, and environmental impacts should be acknowledged and appropriately mitigated. Residents, particularly vulnerable populations, near the bridge landing in Vancouver and on Hayden Island (p. 3-460) could be affected by cumulative construction impacts for an indefinite period of time under a phased scenario. The FEIS mentions mitigation plans, traffic control and business assistance plans as mitigation, but at some point, the effects of long-term cumulative construction impacts may be unsustainable for the most vulnerable populations and businesses. It may be appropriate to consider them as displacements or closures due to the effects of prolonged project construction.

Recommendation:

- Acknowledge and propose mitigation for potential long term/permanent social, economic, and/or environmental effects due to phased implementation.

Financial Analysis

F-001-006

The Financial Plan is key to implementation of a successful, environmentally sensitive project and we appreciate its inclusion in the FEIS. We invited our Regional economist to review the Financial Analysis and would like to offer the following comments as suggestions to strengthen the analysis.

Funding Sources and Fiscal Constraint. According to recent FHWA guidance[1] (p. 5, Q&A 3 and 31, and per the definition of "Reasonably Available", p. 2), project proponents need to demonstrate that the project "can be implemented using committed, available, or reasonably available revenue sources." The assumptions regarding anticipated funding sources (Section 4.4.2) indicate that "procuring these funds depends on future actions by federal and state legislators and administrators." Relevant national, regional, and state economic issues, particularly over the last two years, such as, budget related issues at national and state levels, unemployment impacts, personal income related matters, and so on, could have serious adverse impacts on prospective sources of funding from both federal and state programs. These conditions should be discussed and factored into the Financial Analysis.

Recommendation: Provide rationale for the reasonable availability of CRC funding from the sources identified.

If insufficient Federal discretionary funds are secured for the project, the Analysis indicates that construction may be phased and/or additional capital funds would be required from state sources and/or tolling. As indicated by the CRC Cost Estimate Validation Process[2] (CEVP), there are only two phases – "Full Build" and "nearly Full Build", wherein some interchanges would not be fully built to their final

[1] FHWA, 2011. Supplement to January 28, 2008 "Transportation Planning Requirements and Their Relationship to NEPA Process Completion". February 9, 2011.
[2] CEVP, 2011. Columbia River Crossing CEVP (Cost Estimate Validation Process). Final Report. August 2011.

5

human health issues. We will continue to work with the community to identify areas where human health conditions can be improved and how project impacts in these areas can be mitigated.

The project will also continue to explore means of offsetting the impact of tolls, including transponder acquisition. There are some local discounted transit passes for low-income populations, and the specifics of this program will be assessed as the project continues toward opening.

F-001-005

Construction-related impacts to traffic, noise, and air quality are not expected to be so severe as to warrant displacing residents that are outside the impact area of the project and not addressed in the FEIS. The FEIS describes mitigation that would be implemented to minimize construction impacts to nearby residents. The ROD discusses the potential for additional conformity analysis should construction activities last longer than 5 years in any single location.

F-001-006

Please refer to Chapter 4 of the FEIS for a description of the current scenarios for funding construction and operation of the LPA. This discussion provides an updated assessment of likely funding sources for this project, though it is not common practice to receive funding commitments prior to completion of the alternative selection process. As described in the FEIS, project funding is expected to come from a variety of local, state, and federal sources, with federal funding and tolls providing substantial revenue for the construction. Project staff will continue to work toward confirmation of the major funding sources for the project.

The detailed cash flow analyses requested will be developed as the project moves toward construction. An investment grade tolling analysis will be initiated following the ROD. Both will present financial analysis in

F-001-006

proposed configuration (CEVP, ES-1 and Section 2.4). The Independent Review Panel[3] (IRP) states that the difference in the cost/benefit analysis between the LPA Full Build and the Phased LPA is minor (p. 179), which does not offer much flexibility for phasing the project funding where substantial funding may not be available in accord with the project's build schedule (based on the financial, economic, social, political conditions mentioned above). The IRP made additional comments on pages 184-187 of their report that do not appear to be factored into the analysis.

The Finance Plan Scenarios for various Toll Rate Schedules (Exhibits 4.4-4 through 4.4-9) each assume that each year's project revenue exactly matches that year's capital costs. Given the numerous funding sources and the magnitude of the project, it would be useful to include some cash flow scenarios for project financing as well. The cash flow scenarios should include relevant sources of funding and project cost, including any bond/loan issuance and interest.

Toll-Related Issues. The IRP (p. 176) noted there are two areas of the Finance Plan that represent the largest risk to the project, one of which is revenues from tolls. The Financial Analysis toll rate scenarios are shown in 2006 dollars, while the capital costs are in 2011 dollars (see CEVP), hence revenue/funding should also be expressed in 2011 dollars as the base. The conversion is a straightforward exercise and would provide reviewers with more relevant figures for analysis and decision making.

Recommendation: Present financial analyses in 2011 dollars.

The Oregon State Treasury[4] (OST) CRC Financial Plan Review suggests that "…the CRC assume that projected annual gross toll revenues will be somewhere between 15% to 25% lower than the baseline forecast assumed at the time the 2008 DEIS was adopted" (p. 10), and that "At a 25% toll revenue reduction, estimated project revenues are reduced by 31% or approximately $407 million." (p. 12) The Impresa Economics study[5] also raises these issues relative to traffic crossing numbers and resulting toll revenue. The Financial Analysis does not refer to either of these reports with respect to traffic forecasts and toll revenues.

Recommendation: Provide analysis of scenarios that take into account potential reduction in estimated CRC traffic due to alternative/less costly travel routes, and due to recent, current, and near future economic and social conditions, and apply relevant sensitivity analyses.

The Financial Analysis discusses prospective sources of bonds and assumed bond proceeds, but not the key assumptions for financing through a bond issuance. Toll revenues would be pledges to repay bonds and other loans, and CRC must ensure there will be sufficient net toll revenues to pay debt service.

Recommendation: Incorporate the cost of debt service into the Financial Analysis.

[3] Independent Review Panel (IRP), 2010. I-5 Columbia River Crossing Project, Independent Review Panel, Final Report. July 27, 2010.
[4] Oregon State Treasury (OST), 2011. Columbia River Crossing Financial Plan Review – presentation. Debt Management Division, Oregon State Treasury. July 20, 2011.
[5] Impresa Economics, 2010. Financial Analysis of the Columbia River Crossing, Portland, Oregon. October 2010.

6

a consistent dollar year reference and will incorporate the cost of debt service.

The term "reasonably available" in the referenced guidance refers to a judgment call taking into consideration (a) evidence of review and support of the new revenue assumption by state and local officials and (b) documentation of the rationale and procedural steps to be taken with milestone dates for securing the funds. Evidence of support of the revenue assumptions includes the fact that the finance plan was thoroughly reviewed by state and local officials in both Oregon and Washington as part of receiving Board approvals from each of the participating governments to sign the FEIS. Moreover, the project has been incorporated in the financially constrained Regional Transportation Plan, which also must be based on reasonably available funds. In addition, the FEIS describes in general terms the project milestones and required approvals relating to the implementation of the finance plan.

F-001-006 Thank you for the opportunity to review the CRC Final EIS and to participate in the development of this important project. If you have questions or would like to discuss these comments, please contact me at (206) 553-1601 or by electronic mail at reichgott.christine@epa.gov, or you may contact Elaine Somers of my staff at (206) 553-2966 or by electronic mail at somers.elaine@epa.gov.

Sincerely,

Christine B. Reichgott

Christine B. Reichgott, Manager
Environmental Review and Sediment Management Unit

cc: Ms. Heather Wills, CRC Environmental Manager

7

U.S. Department of Homeland Security
United States Coast Guard

Commander
Thirteenth Coast Guard District

915 Second Avenue
Seattle, WA 98174-1067
Staff Symbol: dpw
Phone: (206) 220-7270
Fax: (206) 220-7265

16591
October 24, 2011

Ms. Heather Wills
CRC Environmental Manager
Columbia River Crossing
700 Washington Street
Vancouver, WA 98660

Dear Ms. Wills:

F-002-001

I am in receipt of and have reviewed the Final Environmental Impact Statement (FEIS) for the Columbia River Crossing (CRC) project dated September 7, 2011. After reviewing the FEIS, I find that the vertical clearance for the proposed I-5 Bridge across the Columbia River does not fully address the reasonable needs of navigation for vessels which ply this stretch of the Columbia River. The proposed vertical clearance of 95 feet above 0.0 Columbia River Datum (CRD) would impede both current and prospective commercial and recreational vessel movement and would adversely impact businesses associated with the operation and maintenance of these vessels. Adverse impacts can also be reasonably expected to businesses that rely on the commercial manufacturing operations that would be directly impacted by the restrictive vertical clearance of the proposed I-5 Bridge across the Columbia River presented in the FEIS.

In previous correspondence, the Coast Guard pointed out that impacts to navigation will be given serious scrutiny. Specifically, the enclosed letter of May 6, 2011 was written to draw the CRC project's attention to a request for 125 foot vertical clearance, stating that the request was "a reasonable need of navigation." Unfortunately, there is no mention in the FEIS, or the Navigational Technical Report, of a navigation need above 110 feet. For this reason, I must conclude that the FEIS, as currently written, does not fully address the navigational impacts. The Coast Guard, as a cooperating agency for this FEIS will not be able to adopt the FEIS until the adverse impacts to navigation as a result of the restrictive vertical clearance are properly captured.

F-002-001

The project conducted a series of studies and stakeholder outreach efforts to determine the appropriate navigation clearance for the proposed bridges. Many factors were considered in these studies. In addition to vessel height, the safe and efficient operation of aviation (Pearson Field), highway, light rail, and the multi-use path (bicycle and pedestrian) were considered.

The selection of the crossing height (low, mid, or high level) for the proposed bridges over the Columbia River and the placement of the piers are affected by three primary constraints: aviation, navigation, and project geometry (i.e., roadway/transit/multi-use path).

Effects on aviation were evaluated using federal regulations for the safe, efficient use and preservation of navigable airspace (14 CFR Part 77). These FAA regulations are applicable to Portland International Airport (PDX) and nearby Pearson Field. Objects violating the requirements of the Part 77 regulations may be deemed a "hazard to aviation". Three navigation channels (Primary Channel, Barge Channel, and Alternate Barge Channel) are currently designated by the United States Army Corps of Engineers (USACE) and permitted by the United States Coast Guard (USCG). The past and future uses of these three channels were also evaluated.

The primary constraints considered in the evaluation also included geometry related to safe and functional operation of the highway, transit, and multi-use path facilities. All facilities must be able to make required connections to interchanges, surface streets, and stations and to do so in a safe manner in accordance with standards of practice.

CRC conducted studies of current river usage and validated these studies through stakeholder outreach to determine what clearances are required by current river users. These efforts included a boat survey to

16591
October 24, 2011

F-002-001

A bridge across the Columbia River, mile 106.5, the I-5 crossing, with a vertical clearance of 95 feet above CRD 0.0, as currently purposed, would impede both current and prospective navigation, until these issues are adequately addressed or mitigating strategies implemented, the bridge will not receive a favorable endorsement for Coast Guard bridge permit issuance. I understand that the CRC project is arranging a meeting with the waterway user requesting the 125 foot vertical clearance, and we intend to participate. I am providing this letter to meet the FEIS 30-day review period that concludes on October 24, 2011, with the reservation to amend or supplement these comments pending the outcome of future coordination with affected waterway users.

Sincerely,

RANDALL OVERTON
Bridge Administrator

Copy: John M. McAVoy, Project Manager, Federal Highway Administration, Oregon Division
Linda M. Gehrke, Deputy Administrator, Federal Transit Administration, Region 10
U. S. Coast Guard Marine Safety Unit Portland, Waterways Management Division
U.S. Coast Guard Sector Columbia River
U.S. Coast Guard Headquarters (CG-5512)

Encl: Commander (dpw) Thirteenth Coast Guard District letter dated May 6, 2011

2

identify the types of vessels that use the Columbia River at the project location, their frequency of usage, and required navigation clearance. Additionally, a series of telephone and/or face-to-face interviews were conducted with river users to validate and update the information contained in the boat survey. Along with these efforts, the USCG held a preliminary hearing on the Columbia River Crossing to solicit comments from river users.

The information gathered from the above-mentioned studies and stakeholder outreach was considered in conjunction with the operational statutes for nearby Pearson Field and with requirements for safe and efficient operation of the proposed highway, light rail, and multi-use path facilities. Taking all of these considerations into account, it was determined that a 95-foot vertical clearance will allow all but three known and infrequent river users to navigate beneath the bridge at all times of year. Some of these users could partially disassemble equipment so they could pass beneath a 95-foot vertical clearance.

If a navigation clearance of 125 feet is provided using the deck truss bridge type selected by the Oregon and Washington Governors, then vehicles, luminaries, sign bridges, and tolling facilities would encroach into Pearson Field Part 77 surfaces (14 CFR Part 77). This may prompt the FAA to issue a determination of “Hazard to Aviation” for the project, meaning that the owner of the bridge would assume full liability in the event of an accident. PDX airspace would not be affected. Also, a higher bridge design may require redesigned columns and foundations, resulting in a larger in-water footprint over what is currently required for the deck truss bridge type.

Increasing the height of the proposed Columbia River bridge to provide 125 feet of vertical clearance has impacts to the safety and cost of the overall project. These impacts include additional hazards to aviation; operational and safety impacts to the highway; operational, safety and



U.S. Department of Homeland Security
United States Coast Guard

Commander
Thirteenth Coast Guard District

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16593
May 6, 2011

RECEIVED
MAY 13 2011
Columbia River Crossing

Mr. Doug Ficco
Director of Project Delivery
Columbia River Crossing
700 Washington Street
Vancouver, WA 98660

Dear Mr. Ficco:

F-002-001

We are in receipt of a request from Thompson Metal Fab, Inc.(TMF) for navigational clearance at the proposed Interstate 5 bridge replacement project. Their request for 125 feet of vertical clearance above 0.0 Columbia River datum will be given serious consideration by the Coast Guard. Based on the information in hand it would appear that this request represents a reasonable need of existing navigation.

As you know, TMF is a significant waterfront industry upstream of the proposed project on the north bank of the Columbia River at Vancouver. Among other items, they manufacture large mobile drill rigs that are shipped by barge overseas.

I met with the President of TMF John Rudi in February following some Congressional inquiry for this bridge project. At that time Mr. Rudi made a request for greater vertical clearance than 95 feet above zero datum, a figure that has hitherto been used by the project as a feasible alternative dimension. I requested Mr. Rudi support our discussion in writing. He did so, but the letter was misaddressed, delaying its receipt.

I am enclosing a copy of that letter with its illustrations.

As you know the existing vertical lift bridges provide about 178 feet of vertical clearance when fully raised. The 125-foot concept would also be a considerable reduction of that existing clearance. However, TMF has made a case that 95 feet would seriously impede both their current and prospective cargo movements through the I-5 crossing.

Sincerely,

Austin Pratt
Chief, Bridge Section
By direction of the District Commander

Encl: As noted

maintenance impacts to transit; and increased environmental impacts. The compromises result in a reduced benefit for 5 out of the 6 specific needs addressed in the project's Purpose and Need Statement when compared to the current alternative. An initial assessment of known and quantifiable costs attributable to the increase in vertical clearance for navigation ranges from approximately $105M to $150M. Additionally, there would be costs associated with the determination of a revised transit alignment, including analyzing changes in environmental effects and re-engaging the public and stakeholders.

Evaluating crossing level and span length with respect to aviation, navigation, and project geometry shows that the mid-level structure would beneficially affect aviation and navigation. While the mid-level bridge does not favor any single interest, it benefits all interests in an equitable fashion with respect to the aviation and navigation constraints. This was the primary reason the mid-level crossing was selected by the Columbia River Crossing Task Force and was validated through six years of public input, including 27,000 public outreach contacts at approximately 900 events.

THOMPSON METAL FAB, INC.
3000 SE HIDDEN WAY • P.O. BOX 5276 (98668) • VANCOUVER • WA 98661
PH 360 . 696 . 0811 PORTLAND 503 . 283 . 4494 • FX 360 . 693 . 1017

March 18, 2011

Austin Pratt
Commander 13th Coast Guard District (dpw)
915 Second Avenue Room 3510
Seattle, WA 98174-1067

RE: Columbia River Crossing – Minimum River Passage Height

Dear Mr. Pratt,

F-002-001 Thompson Metal Fab, Inc. (TMF), situated in the old Kaiser Shipyards on the north bank of the Columbia River, has over 70 years of experience in the fabrication and shipping of numerous heavy industrial as well as marine-related projects. Our company employs over 350 direct labor jobs in its construction of large infrastructure projects, as well as hundreds of indirect jobs in support of our operations. Our facility, located at Columbia Business Center in Vancouver, Washington is unique in its flexibility to construct large industrial projects. Our "roll-on/roll-off" barge slip for river transportation is the only one of its kind on the west coast. The combination of a heavy industrial construction facility and a support yard with marine transportation capability, is an important asset to the region's industrial job base and potential to attract large job producing projects. This capability has given TMF the ability to stay competitive in a business that has largely moved overseas.

Currently the lift span on the interstate bridge is 178' at maximum clearance. It is critical to TMF and the region's industrial competitiveness to maintain a minimum of 125' clearance from zero datum in the new design for the Columbia River Crossing Bridge. Any less clearance will inhibit, not only our ability to attract industrial job-producing projects, but additional users such as the Army Corps of Engineers who depend on structures delivered by barge to support our region's dams and ports east of I-5.

Attached is a partial list of TMF projects that have utilized barge transportation over the past three decades (photos are attached as indicated).

ISO 9001:2008 ASME SEC. VIII

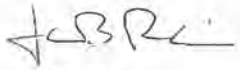
F-002-001 The Columbia Business Center was formerly Kaiser Ship Yard in the 1940s producing Liberty ships for the war effort. From the mid 1950s to 1960, the area was also used for the construction of a number of large offshore oil drilling platforms to support arctic drilling. Nearly every one of these projects required maximum bridge clearance.

A large number of general contractors, fabricators, and other industrial companies utilize the Columbia Business Center's barge facility for river and ocean transportation. Many of these projects also require the highest bridge clearance possible.

The new bridge design may be our region's only chance to ensure future generations the same strategic industrial competitiveness we have now. Do not restrict future jobs and commerce by lowering the passage height of the Columbia River Crossing by less than 125'. The design decisions you make today will possibly last the next 100 years. Please do not choke off the region's future east of I-5 to save a few dollars today.

Thank you for reviewing our information. You and/or your representatives are welcome to tour our facility at any time. If you have any questions, please feel free to contact me.

Sincerely,



John Rudi,
President
Thompson Metal Fab Inc.
360-696-0811
jrudi@tmfab.com


OVERALL: 120' Top of load
50'
50'
20'
On 6/23/2009, River elevation at 6.8 ft.

F-002-001

- **Alaska Ferry Conversion.** In 1973, TMF supplied an exhaust funnel, a solarium structure, and modular subcomponents for the passenger ferry that travels the Inland Passage to Alaska. TMF fabricated the components for this major renovation (the ferry was cut in half and lengthened), and delivered them by barge to the shipyard.

- **Georgia Pacific (Toledo, Oregon) 1,680' Wood Chip Material Handling System.** In 1975, TMF fabricated six 280' tube conveyor sections and all support towers for this project. The completed fabrications were transported by barge to Toledo, Oregon and installed. (See attached photo).

- **Conversion of Barges to Chips & Coke/Soda Ash for Pulp and Paper Mills.** TMF worked on these projects from 1979 to 1981. The converted barges were fabricated to ABS and USCG standards. These projects were installed at our adjacent dock and barge facilities on the Columbia River.

- **ARCO Operation Center Housing Expansion (North Slope, Alaska).** In 1985, TMF fabricated modular super-structures, with bases and decking housing modules, which measured 40' in width by 65' in height by 80' in length. The completed modules were loaded onto a barge standing 65' high and were transported to the North Slope in Alaska. (See attached photo).

- **Newport Bay Floating Restaurant.** In 1986, TMF fabricated a one-piece floating platform to support the waterside restaurant. It was fabricated in the TMF shop and then constructed at the Columbia Business Center barge slip. It was then finally transported to it's final destination in downtown Portland, Oregon.

- **I-90 East Channel Bridge.** In 1986, TMF fabricated trapezoidal tub girders that varied from 98' to 198' in length and weighed between 60 and 200 tons each. TMF pre-assembled the deck on the girders in the Columbia Business Center and the completed components were then loaded on a barge. These were transported to Lake Washington in Seattle and erected off the barge.

- **210' Dry Dock.** In 1987, TMF fabricated a complete 210' dry dock. This included the steel walls and decks, as well as all ballast tanks and piping.

- **Conoco Milne Point Project (North Slope, Alaska).** In 1987, TMF supplied 3,400 tons of fabricated modular steel structures. The completed fabrications required three ocean-going barge loads.

- **Pacific Marine (Honolulu, Hawaii).** In 1989, TMF fabricated a 365-ton SWATH (Small Waterplane Area Twin Hull) excursion vessel. The fabrication consisted of twin cigar-shaped hulls that were 9' in diameter and 132' in length with vessel beams measuring 53'. TMF's location adjacent to the Columbia River proved valuable for launching the vessel. After sea trials, the *Navatek* vessel headed to Hawaii and is still operating today.

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F-002-001

- **Parker Drilling Rig 245 - Mobile Oil Drilling.** In 1990, TMF fabricated a self-propelled mobile oil drilling rig. The drilling module was 43' wide by 78' high by 150' long and it weighed 3,000 tons. The utility module was 40' wide by 58' high by 130' long and it weighed 1,500 tons. The cutting module was 30' wide by 30' high by 40' long and it weighed 350 tons. The completed drilling rig was transported by ocean-going barge from TMF's facility to the North Slope in Alaska. (See attached photo).

- **Powell River Paper Company.** In 1991, TMF supplied the fabricated steel for a Chlorine Dioxide Module that measured 35' wide by 76' high by 35' long with a weight of 350 tons. The module was transported by barge in the vertical position (76' high) from TMF's facility to Power River Paper Company in British Columbia, Canada.

- **US Army Corps of Engineers John Day Dam - Upstream Navigation Lock Gate.** This gate was fabricated in 1991 at our location. The gate measured 28' by 80' by 120' and it weighed 105 tons. It was transported standing up (80' high) for installation. (See attached photo).

- **Trapezoidal Steel Tub Bridge Girders for Seattle West Access.** The girders were fabricated at our location in 1992 and transported by barge to Seattle, Washington for erection.

- **Port of Sacramento 1,100' Bulk Material Handling System.** In 1993, TMF fabricated the 275' tube conveyor sections and all support towers. The completed fabrications were transported by barge to the Port of Sacramento.

- **Orthotropic Tub Girders - Nimitz Freeway.** The Cypress Contract "E" consisted of 13 steel curved tub bridge girders for the reconstruction of the Nimitz Freeway in the San Francisco/Oakland Bay area. The total project weighed 6,000 tons. The largest tub girders weighed 450 tons and measured 50' wide by 250' in length. The completed tub girders required 4 ocean-going barges that delivered the tub girders directly to the job site. (See attached photo).

- **Steel Trusses - Portland Expo Center.** In 1995, trusses were fabricated at our location for the expansion of the Portland Expo Center. The completed trusses were transported by barge to the job site in Portland, Oregon.

- **Bridge Fabrication - 1st Avenue & Duwamish Bascule Bridge Replacement.** In 1996, the complete truss section for this project was fabricated and assembled, along with the finish paint, at TMF's facility. This it was transported by barge to the job site in Seattle, Washington. (See attached photo).

- **Tri-Met Pedestrian Bridge.** In 1996, the pedestrian bridge that crosses the Sunset Highway at Highway 217 was fabricated at our location. The completed fabricated sections were

F-002-001

transported by barge to a nearby location and off-loaded. They were then heavy-hauled overland to the job site.

- **Nordic - Calista.** In 1997, TMF fabricated Modular Mobile Oil Drilling Rig 3. The rig included 850 tons of fabricated steel and it was 45' wide by 78' high by 110' long with complete turnkey assembly. The rig was transported by barge to the North Slope in Alaska. (See attached photo).

- **Pre-Heater Tower for La Farge Cement Plant.** In 1997, TMF fabricated this project and it was then transported by barge from the TMF facility to Richmond, British Columbia in Canada.

- **Golmar Explorer Recovery Ship Conversion to Oil Drilling Vessel.** In 1997, TMF fabricated 2 double-bottom sections, 4 thruster tubs, vessel exhaust stacks, and manifold systems for this project. The completed components were transported by barge from the TMF facility to Cascade General Shipyard.

- **PGE Trojan Decommission Nuclear Reactor Project.** In 1998, TMF fabricated a 120-ton transport support structure and 5" thick shielding component enclosures. The completed fabrications were transported by barge from TMF to the job site and the decommissioned reactor was transported from the job site by barge to the final storage site at the Richland, Washington Hanford site.

- **Esperanza 124 MW Power Barge.** In 1999, TMF fabricated and assembled this barge at our facility. It measured 105' in width by 16' in depth by 284' in length with a weight of 1,800 tons. The completed barge was loaded on top of a 400' by 100' barge and transported to Cascade General Shipyard in Portland, Oregon for final assembly and functional operation testing.

- **Removable Spillway Weir Structure for the Army Corps of Engineers - Lower Granite Lock and Dam.** In 2001, this removable spillway weir was designed to move juvenile fish more efficiently downstream through the dam spillways. The weir was 83' wide by 61' in depth by 115' in length and it weighed approximately 1,000 tons. The weir was completely fabricated at TMF and then transported by barge to Cascade General for repositioning. Then, finally, it was delivered to the job site on the Snake River for installation. (see attached photo).

- **Boeing Delta IV Launch Table.** In 2003, TMF fabricated a 580-ton launch table. It measured 98' in length by 33' in height by 46' in width. This project also included large 50 to 120-ton flame deflector components. The launch table and flame deflectors were fully assembled at the TMF facility and transported by barge to Vandenberg Air Force Base in California and then off-loaded and installed at the launch site.

- **Richmond/San Rafael Bridge.** In 2004, TMF supplied 10,000 tons of structural bridge steel for the sub-structure portion of the Richmond/San Rafael Bridge in California. This seismic retrofit

F-002-001

project was fabricated over a 3-year time period. The larger components were transported by barge directly to the job site in the San Francisco/Oakland Bay area.

- **Removable Spillway Weir Structure for the Army Corps of Engineers - Ice Harbor Lock and Dam.** In 2005, this removable spillway weir was designed to move juvenile fish more efficiently through the dam spillways. The unit measured 70' in width by 68' in height by 105' in length and it weighed approximately 950 tons. The weir was completely fabricated at TMF and transported by barge to Cascade General for repositioning and then transported directly to the job site on the Snake River for installation. (see attached photo).

- **Samuel Engineering - Alaska Gold Mining Project.** In 2005, TMF fabricated hoppers, grizzly grates, ball mill chutes, structural supports, modification of the ball mill, and other mining equipment for this project. TMF's facility was used for the marshaling yard and then all of the equipment and fabrications was transported by barge to the mining site in Nome, Alaska.

- **San Francisco/Oakland Bay Bridge Replacement.** In 2006, TMF fabricated two steel orthotropic tub girders that each weighed more than 1,600 tons and measured over 200' in length and 80' in width. The girders were transported by barge directly to the Bay Area for erection.

- **OHSU Portland Aerial Tram.** In 2006, TMF fabricated the center support towers, the lower station and the upper station for the tram project. The major components were transported by barge from TMF to the job site in Portland, Oregon where they were off-loaded and erected.

- **Caltrans - East Tie-In.** TMF was selected by Caltrans (owner) to work with TY-Linn (designer), CC Meyers (contractor), and DCCI (erector) to fabricate 3,100 plus tons of temporary detour steel for the Oakland Bay Bridge at Yerba Vista Island. This project was completed on an extremely "fast track" basis. TMF met, or exceeded, all schedule requirements while maintaining all Caltrans' requirements. The major large components required four barge loads to be transported from TMF to the job site in California. This project was completed in June 2009.

- **Parker Drilling Company/British Petroleum Liberty Oil Drilling Rig (Alaska).** This oil drilling rig was delivered from our facility to the North Slope Alaska in July 2009. TMF furnished approximately 5.5 million pounds of fabricated steel and rig-up support. The rig consisted of three large modules. The Drill Module was 58' wide by 98' high (transport height) by 68' long and weighed 900 tons. The Pipe Barn Module was 158' wide by 45' high by 170' long and it weighed 2,560 tons. Finally, the Drill Service Module was 50' wide by 48' high by 177' long and it weighed 2600 tons. (see attached photo).

- **Parker Drilling AADU Oil Drilling Rigs (272 and 273).** These are currently in the process of being delivered to the North Slope in Alaska. Each drilling rig was comprised of three main modules. The Mud Modules weigh 600 tons; the Drill Modules weigh 700 tons; and the Utility Modules weigh 450 tons (6 modules total). The size of the Mud and Utility modules is 48' wide by 55'

F-002-001

high by 90' long. The Drill Module was 76' high with the mast in the lay-down position. After being loaded on an ocean-going barge, the tie-down blocking added 23' feet to the overall height. Therefore, the final height of the unit on the barge was 99 feet.

Doyon Oil Drilling Rig 25. TMF furnished over 4 million pounds of steel and aluminum fabrication and served as the primary contractor for this job. TMF managed all rig-up yard activities, including mechanical, electrical, and functional checkout. The rig consisted of 6 individual complexes:

-The Power Complex weighed 550 tons and was 56' long by 40' wide by 42' high.
-The Drill Complex weighed 560 tons and was 96' long by 37' wide by 40' high.
-The Pipe Complex weighed 560 tons and was 68' long by 47' wide by 25' high.
-The Mud Complex weighed 550 tons and was 68' long by 40' wide by 49' high.
-The Pump Complex weighed 560 tons and was 64' long by 40' wide by 52' high.
-The Casing Complex weighed 500 tons and was 60' long by 56' wide by 40' high.

There was also a Rig Mast that was 148' long (when fully extended) by 26' wide (at the base) by 25' high. The overall footprint of this project was 265' by 150' and it weighed 6.2 million pounds.

5

THOMPSON METAL FAB, INC.
3000 S.E. Hidden Way
Vancouver, Washington 98661

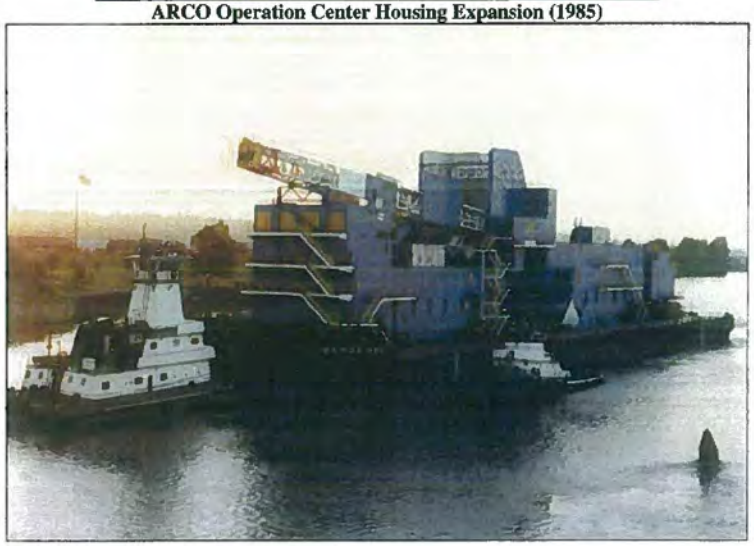
Thompson Metal Fab, Inc. (TMF) has over 70 years of experience in the fabrication of marine related projects.



Georgia Pacific (Toledo, Oregon)—1,680 Foot Wood Chip Material Handling System (1975)



ARCO Operation Center Housing Expansion (1985)



Parker Drill Rig 245 (1990)

7



Up-Stream Navigational Lock Gate (1991)



Orthotropic Tub Girder Fabrication—Nimitz Freeway (1995)

8



Bridge Fabrication—1st Avenue & Duwamish (1996)



Nordic – Calista Modular Mobile Oil Drilling Rig 3 (1997)



1,000 Ton Removable Spillway Weir for Lower Granite Dam (2001)

10



950 Ton Removable Spillway Weir for Ice Harbor Lock and Dam (2005)



Parker Drilling/British Petroleum Liberty Oil Drilling Rig (2009)

11

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
ECOSYSTEMS, TRIBAL AND
PUBLIC AFFAIRS

October 24, 2011

Mr. John McAvoy, PE, Major Projects Manager
Federal Highway Administration
Western Federal Lands Building
610 E. 5th St.
Vancouver, Washington 98661

Ms. Linda Gehrke, Deputy Regional Administrator, Region 10
Federal Transit Administration
915 Second Avenue, Suite 3142
Seattle, Washington 98174

Re: Interstate 5 Columbia River Crossing Project Final Environmental Impact Statement
EPA Project Number: 05-052-FHW

Dear Mr. McAvoy and Ms. Gehrke:

F-001-001

The U.S. Environmental Protection Agency (EPA) has reviewed the Interstate 5 Columbia River Crossing Project Final Environmental Impact Statement (FEIS) and Final Section 4(f) Evaluation. We are submitting comments in accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act.

The Columbia River Crossing (CRC) FEIS identifies the locally preferred alternative (LPA) as a refined version of Alternative 3 in the Draft EIS. The LPA includes a new river crossing over the Columbia River, improvements to seven interchanges, bicycle and pedestrian improvements, light rail transit from Portland to Clark College in Vancouver with transit stations, park and rides, bus route changes, an expanded light rail maintenance facility, tolls on motorists for project financing and as a travel demand management tool, and transportation demand and system management (TDM and TSM) measures. Depending on project funding, the LPA could be constructed fully or with phasing of several highway elements.

At the Draft EIS stage, we expressed our general support for the proposed project, particularly with respect to its multi-modal features, use of tolls and other TDM and TSM measures to reduce single occupancy vehicle travel and its associated impacts. We also raised concerns with respect to a number of environmental, human health, social, and economic issues, including potential impacts to the Troutdale Sole Source Aquifer and other project area groundwater resources; air quality; environmental justice and impacts to disadvantaged and vulnerable populations; water quality, impaired water bodies, and subsistence fishing uses; land use; and ecological connectivity. We also reviewed and commented on the project financial analysis and potential funding impacts. We would like to express our appreciation for all the good work that has transpired since the Draft EIS was issued, and to thank you for working with

F-001-001

Thank you for your comments.

F-001-001 us to improve the analysis and disclosure of and mitigation for potential project impacts. Our comments regarding specific aspects of the project are provided below.

Groundwater and the Troutdale Sole Source Aquifer

F-001-002 The FEIS together with the pertinent electronic Technical Reports and Appendices (Geology and Soils, Water Quality and Hydrology, Hazardous Materials and its Appendix F, the Troutdale Sole Source Aquifer Report [mis-referenced as Appendix E in the FEIS, p. 3-334 and elsewhere]) do a good job of presenting available data, potential impacts, and description of proposed monitoring. We recommend that these groundwater-related documents, any updates to them and any new reports, be compiled and made readily visible and available to the public on an ongoing basis throughout project design, construction, and beyond.

The CRC project is currently working with the EPA at test shaft drilling sites to ensure that appropriate subsurface soil and groundwater samples are taken to determine the presence of contaminants where pile driving and shaft drilling would occur. We note the following future groundwater-related activities identified in the FEIS that would benefit from clarification and more specific commitment in the Record of Decision (ROD):

- Focused site assessments for hazardous materials (p. 3-423) would be conducted prior to construction to evaluate existing impacts to soil, sediment, and groundwater. An agency approved work plan would have goals, objectives, and procedures for each site assessment.
- An analysis of impacts to groundwater movement due to project construction of shafts, piles, retaining walls and soil stabilization structures, which are projected to be minor and localized (p. 3-409), is deferred to future evaluation as project design proceeds.
- Ongoing drinking water supply monitoring of groundwater by the City of Vancouver will help to verify that the project does not impact Vancouver's drinking water supply (p. 3-424).

Recommendations:

- Identify the specific agency that would approve the focused site assessment for hazardous materials. Identify who would be notified of any hazardous materials discoveries and the response plan chain of events.
- Indicate where the analysis of impacts to groundwater movement can be obtained or reviewed by the public.
- Disclose any other means or plans to monitor groundwater drinking water supplies that may be affected by project construction and operations.
- Compile and make readily available to the public, on an ongoing basis, all groundwater-related reports/documents as stated above.

Air Quality

F-001-003 Cumulative, Long-Term Construction Impacts: We agree with the statement in the FEIS that construction impacts to the surrounding environment are a concern for any of the build alternatives (p. 2-68). The FEIS states that the highest potential for "temporary" cumulative construction impacts, such as local traffic congestion and rerouting, noise and air pollution, is likely near the bridge landing in

F-001-002

The DOTs commit to the following mitigation measures and are including them in the Record of Decision:

- Focused Environmental Assessment's (FEAs) would be reviewed and approved by the state DOT hazardous material departments within each respective state (Oregon and Washington). These FEAs will be conducted in areas not covered by Environmental Site Assessments (ESA) Phase 1 or Phase 2 assessments and will address the potential to encounter hazardous materials at specific sites, impacts of construction on hazardous materials and any hazardous materials discoveries. As part of the FEA work plan the DOT hazardous materials departments will coordinate with ODEQ, WDOE and/or EPA on any hazardous materials discoveries and implement the response plan.
- All project reports, analysis and plans are available and will continue to be available on the Columbia River Crossing website.
- The City of Vancouver presently monitors drinking water, this information can be compiled and made available to the public either through the CRC website or the City of Vancouver website. During project construction the FEA work plan will address the potential to encounter hazardous materials at specific sites, impacts of construction on hazardous materials and handling any hazardous materials discoveries. Post project construction completion stormwater infiltration facilities will be designed to provide the necessary separation between the bottom of the basin and seasonal high of the groundwater table to minimize any potential of groundwater contamination.

F-001-003

Although construction will last more than 5 years, project construction activities at any one site are not expected to last more than 5 years. Thus, a CO hot-spot analysis was not conducted. If, as more information

F-001-003

Vancouver and on Hayden Island, where other large construction projects are likely and where CRC construction duration and intensity will be high (p. 3-460). Based on the substantial levels of uncertainty regarding the nature, extent, costs, and delays associated with hazardous materials sites discovery and clean up, historical/cultural/archeological discoveries, project financing, construction phasing, overlapping non-CRC activities/construction in the project vicinity (p. 3-459), and other unforeseen construction impacts and delays, we would expect project construction, and its associated array of impacts, to exceed a five year period.

With respect to air quality, this is significant when one considers the threshold used in the conformity rule. Under the transportation conformity rule, "Temporary increases are defined as those that occur only during the construction phase and last five years or less at any individual site" 40 CFR 93.123(c)(5). The conformity rule does not consider construction periods more than five years as temporary.

The Portland Air Toxics Assessment identified construction activities as a significant source of air toxics in the urban area. In the case of the CRC project, construction of new bridges, roadways, interchanges, light rail transit, bicycle/pedestrian facilities, retaining walls, sound walls, bridge removal, and operations in staging areas all individually or cumulatively can be significant sources of regulated pollutants and air toxics. The best case scenario for duration of project construction is six years, with the Hayden Island and southern Vancouver communities experiencing the most prolonged and intense construction activities. In addition, Subarea 2, which includes the southern Vancouver neighborhoods, is projected to experience higher levels of operational air pollutants (carbon monoxide and nitrogen oxide) with the Locally Preferred Alternative (LPA) than under the No Build Alternative due to greater vehicle miles traveled (p. 3-279). The long-term construction emissions and other construction-related stressors, in addition to elevated long-term or permanent operations emissions (even if lower than current emissions) point to the importance of identifying sensitive receptors, particularly those exposed to these long-term impacts, and to using additional emissions controls for construction equipment project-wide, and particularly within the core construction areas.

Recommendations:

- Identify project area sensitive receptor locations in the ROD and ensure that mitigation commitments address these areas.
- Include commitments for additional emissions controls for construction equipment in the Record of Decision (ROD). There is substantial local evaluation of emission control technologies for construction equipment. This year the City of Portland completed two EPA Diesel Emission Reduction Act grants wherein they successfully installed 156 after-treatment devices and 157 direct-fired heaters as an idle reduction strategy on public and private construction equipment. Contact Kyle Diesner, City of Portland, at 503-823-4166 for more information.
- Require retrofitting of construction equipment in construction contracts. U.S. DOT CMAQ money can be used to help fund diesel retrofits and there are many examples of construction retrofit contract language across the Country.
- See the Clean Construction USA website at http://www.epa.gov/otaq/diesel/construction/ for many examples of construction mitigation measures, case studies, and examples of institutional arrangements for implementing this mitigation.

3

is known, construction at any one staging site is expected to last more than 5 years, a hot spot analysis will be completed.

Sensitive receptors were not explicitly identified in the FEIS, as CRC did not conduct modeling for the FEIS. However, results from the latest Portland Air Toxics Solutions (PATS) modeling, were incorporated into the FEIS. Concentration contours for benzene, formaldehyde and diesel PM were presented for the on-road sources and for on- and off-road mobile source categories. These contours provide the public with information about the spatial distribution of these pollutants across the region and in the project area.

As described in more detail in Chapter 3 (Section 3.10) of the FEIS, construction mitigation will focus on controlling dust and exhaust emissions from demolition and construction activities and on minimizing traffic congestion. Regarding dust, the project will comply with WAC 173-400-040 in Washington and Section 290 of ODOT's standard specifications in Oregon, regulations that limit dust emissions. The WAC includes enforcement actions and fines in cases where dust becomes a nuisance and Section 290 includes a list of precautions to be taken to avoid dust emissions.

Regarding exhaust emissions, the contractor would be required to develop a pollution control plan that includes documentation of operational measures that would be used to reduce emissions. This plan would include a requirement for the use of ultra low sulfur diesel and idling location and duration limitations. In addition, the DOTs are evaluating potential additional emission control technologies for construction equipment. The DOTs will continue to monitor and evaluate changes in technology and related regulations. Decisions regarding any additional emission controls will be made during final design.

Stationary sources such as concrete and asphalt mix plants are

F-001-003

- Commit to a full suite of air quality construction mitigation measures to avoid and minimize construction-related emissions to the extent possible.
- Include in the ROD a commitment that WSDOT and ODOT will continue to work with neighborhoods and vulnerable populations to address air quality concerns and impacts as the project moves into final design and construction.

Environmental Justice – Cumulative Effects to Disadvantaged and Vulnerable Populations

F-001-004

We acknowledge and appreciate the benefits associated with the proposed project, and we appreciate the efforts to minimize impacts to disadvantaged populations in the project area through outreach and incorporation of community input. We do remain concerned that the direct and indirect environmental, human health, social, and economic project impacts would likely affect disadvantaged populations within the project area disproportionately as compared to populations that reside outside the project area. It is important to acknowledge that the same project benefits accrue to non-disadvantaged communities outside the construction zone, but without the impacts, or in the case of regressive tolls, with less impact. Also, the general approach to analyzing and mitigating individual impacts, while important and useful, may not fully illuminate and enable a response to the holistic social, cultural, economic, and human health effects that may result from cumulative impacts.

We continue to recommend that available health data be provided to help characterize baseline conditions in affected neighborhoods and to inform efforts to mitigate impacts. The CRC Office indicates that maps of asthma rates and accompanying data and explanation could be provided, but that since the project is having no adverse impact on air quality, there is little need to discuss the potential for disproportionate or adverse effects. We believe this health information should be disclosed and used in describing cumulative effects to vulnerable populations, and applied in project planning and design to reduce impacts throughout the project area, whether or not a community has voiced concern regarding air pollution or other potential project-related impacts. The cumulative effects analysis should recognize that all project-related impacts, whether social, economic, or environmental, have potential impacts to human health and well-being.

We suggest considering augmentation of the mitigation listed for CRC tolling impacts. Allowing disadvantaged people to use their electronic benefit cards (food stamp funds) to purchase transponders and pay tolls is a convenience, but is essentially a decrease in their public assistance funds. Considering the scope of current and additional impacts being borne by the affected neighborhoods and the current economic struggles, it would seem appropriate to offer low income residents free or discounted transponders and free or reduced fare transit passes.

Recommendations:

- Include baseline health data in the ROD, and use it to inform further mitigation commitments.
- To alleviate cumulative effects from past, current, and additional future impacts, consider remedies that are social, economic, and environmental in nature, result in reduced stress, and improve the quality and enjoyment of life in cumulatively affected communities.
- Consider providing free or discounted transponders and transit passes to low income residents.

4

generally required to obtain air permits from DEQ or SWCAA and to comply with regulations to control dust and other pollutant emissions. As a result, their operations are typically well controlled and do not require additional project-specific mitigation measures.

Strategies to minimize the occurrence and effect of roadway congestion during construction would be developed during the design phase. Alternatives would be refined, impacts to traffic analyzed, and transportation agencies and experts brought in to develop mitigation plans and solutions. Some of these strategies may include encouraging mode shifts to non-SOV trips, construction management techniques/incentives to avoid/reduce congestion, and providing information to travelers to encourage alternate route/travel times.

WSDOT and ODOT will continue to work with neighborhoods and vulnerable populations to address air quality concerns and impacts as the project moves into final design and construction.

F-001-004

The project will work closely with the affected neighborhoods for the duration of construction, and beyond. As part of this outreach, and fulfilling federal and other guidance on environmental justice, the project will acknowledge and address unique vulnerabilities throughout the community. The FEIS includes mitigation to conduct outreach on tolling in multiple languages, to work closely with the State Schools for the Blind and the Deaf in Vancouver, and to actively manage construction related emissions, dust, and other impacts. The mitigation commitments have been updated to include specific work to identify and help mitigate effects that are specific to individuals with health problems or other unique circumstances. It is not possible, without an independent survey and analysis being initiated, to isolate health conditions and affects within the study area specifically. Instead the project will incorporate into its outreach and public involvement programs, a specific emphasis on

F-001-005

Phased Implementation. Because the CRC project construction may be phased the EIS should acknowledge that, at some point, "temporary" impacts should be considered long term or permanent impacts depending on the nature and duration of effects. Conformity rules under the Clean Air Act identify impacts as temporary only if they last 5 years or less. The question of whether or not this finding should also apply to impacts regarding vulnerable populations, noise, water quality, threatened and endangered species, and so on should be examined.

Long term social, economic, and environmental impacts should be acknowledged and appropriately mitigated. Residents, particularly vulnerable populations, near the bridge landing in Vancouver and on Hayden Island (p. 3-460) could be affected by cumulative construction impacts for an indefinite period of time under a phased scenario. The FEIS mentions mitigation plans, traffic control and business assistance plans as mitigation, but at some point, the effects of long-term cumulative construction impacts may be unsustainable for the most vulnerable populations and businesses. It may be appropriate to consider them as displacements or closures due to the effects of prolonged project construction.

Recommendation:

- Acknowledge and propose mitigation for potential long term/permanent social, economic, and/or environmental effects due to phased implementation.

Financial Analysis

F-001-006

The Financial Plan is key to implementation of a successful, environmentally sensitive project and we appreciate its inclusion in the FEIS. We invited our Regional economist to review the Financial Analysis and would like to offer the following comments as suggestions to strengthen the analysis.

Funding Sources and Fiscal Constraint. According to recent FHWA guidance[1] (p. 5, Q&A 3 and 31, and per the definition of "Reasonably Available", p. 2), project proponents need to demonstrate that the project "can be implemented using committed, available, or reasonably available revenue sources." The assumptions regarding anticipated funding sources (Section 4.4.2) indicate that "procuring these funds depends on future actions by federal and state legislators and administrators." Relevant national, regional, and state economic issues, particularly over the last two years, such as, budget related issues at national and state levels, unemployment impacts, personal income related matters, and so on, could have serious adverse impacts on prospective sources of funding from both federal and state programs. These conditions should be discussed and factored into the Financial Analysis.

Recommendation: Provide rationale for the reasonable availability of CRC funding from the sources identified.

If insufficient Federal discretionary funds are secured for the project, the Analysis indicates that construction may be phased and/or additional capital funds would be required from state sources and/or tolling. As indicated by the CRC Cost Estimate Validation Process[2] (CEVP), there are only two phases – "Full Build" and "nearly Full Build", wherein some interchanges would not be fully built to their final

[1] FHWA, 2011. Supplement to January 28, 2008 "Transportation Planning Requirements and Their Relationship to NEPA Process Completion". February 9, 2011.
[2] CEVP, 2011. Columbia River Crossing CEVP (Cost Estimate Validation Process). Final Report. August 2011.

5

human health issues. We will continue to work with the community to identify areas where human health conditions can be improved and how project impacts in these areas can be mitigated.

The project will also continue to explore means of offsetting the impact of tolls, including transponder acquisition. There are some local discounted transit passes for low-income populations, and the specifics of this program will be assessed as the project continues toward opening.

F-001-005

Construction-related impacts to traffic, noise, and air quality are not expected to be so severe as to warrant displacing residents that are outside the impact area of the project and not addressed in the FEIS. The FEIS describes mitigation that would be implemented to minimize construction impacts to nearby residents. The ROD discusses the potential for additional conformity analysis should construction activities last longer than 5 years in any single location.

F-001-006

Please refer to Chapter 4 of the FEIS for a description of the current scenarios for funding construction and operation of the LPA. This discussion provides an updated assessment of likely funding sources for this project, though it is not common practice to receive funding commitments prior to completion of the alternative selection process. As described in the FEIS, project funding is expected to come from a variety of local, state, and federal sources, with federal funding and tolls providing substantial revenue for the construction. Project staff will continue to work toward confirmation of the major funding sources for the project.

The detailed cash flow analyses requested will be developed as the project moves toward construction. An investment grade tolling analysis will be initiated following the ROD. Both will present financial analysis in

F-001-006

proposed configuration (CEVP, ES-1 and Section 2.4). The Independent Review Panel[3] (IRP) states that the difference in the cost/benefit analysis between the LPA Full Build and the Phased LPA is minor (p. 179), which does not offer much flexibility for phasing the project funding where substantial funding may not be available in accord with the project's build schedule (based on the financial, economic, social, political conditions mentioned above). The IRP made additional comments on pages 184-187 of their report that do not appear to be factored into the analysis.

The Finance Plan Scenarios for various Toll Rate Schedules (Exhibits 4.4-4 through 4.4-9) each assume that each year's project revenue exactly matches that year's capital costs. Given the numerous funding sources and the magnitude of the project, it would be useful to include some cash flow scenarios for project financing as well. The cash flow scenarios should include relevant sources of funding and project cost, including any bond/loan issuance and interest.

Toll-Related Issues. The IRP (p. 176) noted there are two areas of the Finance Plan that represent the largest risk to the project, one of which is revenues from tolls. The Financial Analysis toll rate scenarios are shown in 2006 dollars, while the capital costs are in 2011 dollars (see CEVP), hence revenue/funding should also be expressed in 2011 dollars as the base. The conversion is a straightforward exercise and would provide reviewers with more relevant figures for analysis and decision making.

Recommendation: Present financial analyses in 2011 dollars.

The Oregon State Treasury[4] (OST) CRC Financial Plan Review suggests that "…the CRC assume that projected annual gross toll revenues will be somewhere between 15% to 25% lower than the baseline forecast assumed at the time the 2008 DEIS was adopted" (p. 10), and that "At a 25% toll revenue reduction, estimated project revenues are reduced by 31% or approximately $407 million." (p. 12) The Impresa Economics study[5] also raises these issues relative to traffic crossing numbers and resulting toll revenue. The Financial Analysis does not refer to either of these reports with respect to traffic forecasts and toll revenues.

Recommendation: Provide analysis of scenarios that take into account potential reduction in estimated CRC traffic due to alternative/less costly travel routes, and due to recent, current, and near future economic and social conditions, and apply relevant sensitivity analyses.

The Financial Analysis discusses prospective sources of bonds and assumed bond proceeds, but not the key assumptions for financing through a bond issuance. Toll revenues would be pledges to repay bonds and other loans, and CRC must ensure there will be sufficient net toll revenues to pay debt service.

Recommendation: Incorporate the cost of debt service into the Financial Analysis.

[3] Independent Review Panel (IRP), 2010. I-5 Columbia River Crossing Project, Independent Review Panel, Final Report. July 27, 2010.
[4] Oregon State Treasury (OST), 2011. Columbia River Crossing Financial Plan Review – presentation. Debt Management Division, Oregon State Treasury. July 20, 2011.
[5] Impresa Economics, 2010. Financial Analysis of the Columbia River Crossing, Portland, Oregon. October 2010.

6

a consistent dollar year reference and will incorporate the cost of debt service.

The term "reasonably available" in the referenced guidance refers to a judgment call taking into consideration (a) evidence of review and support of the new revenue assumption by state and local officials and (b) documentation of the rationale and procedural steps to be taken with milestone dates for securing the funds. Evidence of support of the revenue assumptions includes the fact that the finance plan was thoroughly reviewed by state and local officials in both Oregon and Washington as part of receiving Board approvals from each of the participating governments to sign the FEIS. Moreover, the project has been incorporated in the financially constrained Regional Transportation Plan, which also must be based on reasonably available funds. In addition, the FEIS describes in general terms the project milestones and required approvals relating to the implementation of the finance plan.

F-001-006 Thank you for the opportunity to review the CRC Final EIS and to participate in the development of this important project. If you have questions or would like to discuss these comments, please contact me at (206) 553-1601 or by electronic mail at reichgott.christine@epa.gov, or you may contact Elaine Somers of my staff at (206) 553-2966 or by electronic mail at somers.elaine@epa.gov.

Sincerely,

Christine B. Reichgott

Christine B. Reichgott, Manager
Environmental Review and Sediment Management Unit

cc: Ms. Heather Wills, CRC Environmental Manager

U.S. Department of Homeland Security
United States Coast Guard

Commander
Thirteenth Coast Guard District

915 Second Avenue
Seattle, WA 98174-1067
Staff Symbol: dpw
Phone: (206) 220-7270
Fax: (206) 220-7265

16591
October 24, 2011

Ms. Heather Wills
CRC Environmental Manager
Columbia River Crossing
700 Washington Street
Vancouver, WA 98660

Dear Ms. Wills:

F-002-001

I am in receipt of and have reviewed the Final Environmental Impact Statement (FEIS) for the Columbia River Crossing (CRC) project dated September 7, 2011. After reviewing the FEIS, I find that the vertical clearance for the proposed I-5 Bridge across the Columbia River does not fully address the reasonable needs of navigation for vessels which ply this stretch of the Columbia River. The proposed vertical clearance of 95 feet above 0.0 Columbia River Datum (CRD) would impede both current and prospective commercial and recreational vessel movement and would adversely impact businesses associated with the operation and maintenance of these vessels. Adverse impacts can also be reasonably expected to businesses that rely on the commercial manufacturing operations that would be directly impacted by the restrictive vertical clearance of the proposed I-5 Bridge across the Columbia River presented in the FEIS.

In previous correspondence, the Coast Guard pointed out that impacts to navigation will be given serious scrutiny. Specifically, the enclosed letter of May 6, 2011 was written to draw the CRC project's attention to a request for 125 foot vertical clearance, stating that the request was "a reasonable need of navigation." Unfortunately, there is no mention in the FEIS, or the Navigational Technical Report, of a navigation need above 110 feet. For this reason, I must conclude that the FEIS, as currently written, does not fully address the navigational impacts. The Coast Guard, as a cooperating agency for this FEIS will not be able to adopt the FEIS until the adverse impacts to navigation as a result of the restrictive vertical clearance are properly captured.

F-002-001

The project conducted a series of studies and stakeholder outreach efforts to determine the appropriate navigation clearance for the proposed bridges. Many factors were considered in these studies. In addition to vessel height, the safe and efficient operation of aviation (Pearson Field), highway, light rail, and the multi-use path (bicycle and pedestrian) were considered.

The selection of the crossing height (low, mid, or high level) for the proposed bridges over the Columbia River and the placement of the piers are affected by three primary constraints: aviation, navigation, and project geometry (i.e., roadway/transit/multi-use path).

Effects on aviation were evaluated using federal regulations for the safe, efficient use and preservation of navigable airspace (14 CFR Part 77). These FAA regulations are applicable to Portland International Airport (PDX) and nearby Pearson Field. Objects violating the requirements of the Part 77 regulations may be deemed a "hazard to aviation". Three navigation channels (Primary Channel, Barge Channel, and Alternate Barge Channel) are currently designated by the United States Army Corps of Engineers (USACE) and permitted by the United States Coast Guard (USCG). The past and future uses of these three channels were also evaluated.

The primary constraints considered in the evaluation also included geometry related to safe and functional operation of the highway, transit, and multi-use path facilities. All facilities must be able to make required connections to interchanges, surface streets, and stations and to do so in a safe manner in accordance with standards of practice.

CRC conducted studies of current river usage and validated these studies through stakeholder outreach to determine what clearances are required by current river users. These efforts included a boat survey to

16591
October 24, 2011

F-002-001

A bridge across the Columbia River, mile 106.5, the I-5 crossing, with a vertical clearance of 95 feet above CRD 0.0, as currently purposed, would impede both current and prospective navigation, until these issues are adequately addressed or mitigating strategies implemented, the bridge will not receive a favorable endorsement for Coast Guard bridge permit issuance. I understand that the CRC project is arranging a meeting with the waterway user requesting the 125 foot vertical clearance, and we intend to participate. I am providing this letter to meet the FEIS 30-day review period that concludes on October 24, 2011, with the reservation to amend or supplement these comments pending the outcome of future coordination with affected waterway users.

Sincerely,

RANDALL OVERTON
Bridge Administrator

Copy: John M. McAVoy, Project Manager, Federal Highway Administration, Oregon Division
Linda M. Gehrke, Deputy Administrator, Federal Transit Administration, Region 10
U. S. Coast Guard Marine Safety Unit Portland, Waterways Management Division
U.S. Coast Guard Sector Columbia River
U.S. Coast Guard Headquarters (CG-5512)

Encl: Commander (dpw) Thirteenth Coast Guard District letter dated May 6, 2011

2

identify the types of vessels that use the Columbia River at the project location, their frequency of usage, and required navigation clearance. Additionally, a series of telephone and/or face-to-face interviews were conducted with river users to validate and update the information contained in the boat survey. Along with these efforts, the USCG held a preliminary hearing on the Columbia River Crossing to solicit comments from river users.

The information gathered from the above-mentioned studies and stakeholder outreach was considered in conjunction with the operational statutes for nearby Pearson Field and with requirements for safe and efficient operation of the proposed highway, light rail, and multi-use path facilities. Taking all of these considerations into account, it was determined that a 95-foot vertical clearance will allow all but three known and infrequent river users to navigate beneath the bridge at all times of year. Some of these users could partially disassemble equipment so they could pass beneath a 95-foot vertical clearance.

If a navigation clearance of 125 feet is provided using the deck truss bridge type selected by the Oregon and Washington Governors, then vehicles, luminaries, sign bridges, and tolling facilities would encroach into Pearson Field Part 77 surfaces (14 CFR Part 77). This may prompt the FAA to issue a determination of “Hazard to Aviation” for the project, meaning that the owner of the bridge would assume full liability in the event of an accident. PDX airspace would not be affected. Also, a higher bridge design may require redesigned columns and foundations, resulting in a larger in-water footprint over what is currently required for the deck truss bridge type.

Increasing the height of the proposed Columbia River bridge to provide 125 feet of vertical clearance has impacts to the safety and cost of the overall project. These impacts include additional hazards to aviation; operational and safety impacts to the highway; operational, safety and



U.S. Department of Homeland Security
United States Coast Guard

Commander
Thirteenth Coast Guard District

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16593
May 6, 2011

RECEIVED
MAY 13 2011
Columbia River Crossing

Mr. Doug Ficco
Director of Project Delivery
Columbia River Crossing
700 Washington Street
Vancouver, WA 98660

Dear Mr. Ficco:

F-002-001 We are in receipt of a request from Thompson Metal Fab, Inc.(TMF) for navigational clearance at the proposed Interstate 5 bridge replacement project. Their request for 125 feet of vertical clearance above 0.0 Columbia River datum will be given serious consideration by the Coast Guard. Based on the information in hand it would appear that this request represents a reasonable need of existing navigation.

As you know, TMF is a significant waterfront industry upstream of the proposed project on the north bank of the Columbia River at Vancouver. Among other items, they manufacture large mobile drill rigs that are shipped by barge overseas.

I met with the President of TMF John Rudi in February following some Congressional inquiry for this bridge project. At that time Mr. Rudi made a request for greater vertical clearance than 95 feet above zero datum, a figure that has hitherto been used by the project as a feasible alternative dimension. I requested Mr. Rudi support our discussion in writing. He did so, but the letter was misaddressed, delaying its receipt.

I am enclosing a copy of that letter with its illustrations.

As you know the existing vertical lift bridges provide about 178 feet of vertical clearance when fully raised. The 125-foot concept would also be a considerable reduction of that existing clearance. However, TMF has made a case that 95 feet would seriously impede both their current and prospective cargo movements through the I-5 crossing.

Sincerely,

Austin Pratt
Chief, Bridge Section
By direction of the District Commander

Encl: As noted

maintenance impacts to transit; and increased environmental impacts. The compromises result in a reduced benefit for 5 out of the 6 specific needs addressed in the project's Purpose and Need Statement when compared to the current alternative. An initial assessment of known and quantifiable costs attributable to the increase in vertical clearance for navigation ranges from approximately $105M to $150M. Additionally, there would be costs associated with the determination of a revised transit alignment, including analyzing changes in environmental effects and re-engaging the public and stakeholders.

Evaluating crossing level and span length with respect to aviation, navigation, and project geometry shows that the mid-level structure would beneficially affect aviation and navigation. While the mid-level bridge does not favor any single interest, it benefits all interests in an equitable fashion with respect to the aviation and navigation constraints. This was the primary reason the mid-level crossing was selected by the Columbia River Crossing Task Force and was validated through six years of public input, including 27,000 public outreach contacts at approximately 900 events.

THOMPSON METAL FAB, INC.
3000 SE HIDDEN WAY • P.O. BOX 5276 (98668) • VANCOUVER • WA 98661
PH 360 . 696 . 0811 PORTLAND 503 . 283 . 4494 • FX 360 . 693 . 1017

March 18, 2011

Austin Pratt
Commander 13th Coast Guard District (dpw)
915 Second Avenue Room 3510
Seattle, WA 98174-1067

RE: Columbia River Crossing – Minimum River Passage Height

Dear Mr. Pratt,

F-002-001 Thompson Metal Fab, Inc. (TMF), situated in the old Kaiser Shipyards on the north bank of the Columbia River, has over 70 years of experience in the fabrication and shipping of numerous heavy industrial as well as marine-related projects. Our company employs over 350 direct labor jobs in its construction of large infrastructure projects, as well as hundreds of indirect jobs in support of our operations. Our facility, located at Columbia Business Center in Vancouver, Washington is unique in its flexibility to construct large industrial projects. Our "roll-on/roll-off" barge slip for river transportation is the only one of its kind on the west coast. The combination of a heavy industrial construction facility and a support yard with marine transportation capability, is an important asset to the region's industrial job base and potential to attract large job producing projects. This capability has given TMF the ability to stay competitive in a business that has largely moved overseas.

Currently the lift span on the interstate bridge is 178' at maximum clearance. It is critical to TMF and the region's industrial competitiveness to maintain a minimum of 125' clearance from zero datum in the new design for the Columbia River Crossing Bridge. Any less clearance will inhibit, not only our ability to attract industrial job-producing projects, but additional users such as the Army Corps of Engineers who depend on structures delivered by barge to support our region's dams and ports east of I-5.

Attached is a partial list of TMF projects that have utilized barge transportation over the past three decades (photos are attached as indicated).

ISO 9001:2008 ASME SEC. VIII

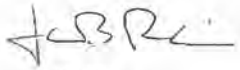
F-002-001 The Columbia Business Center was formerly Kaiser Ship Yard in the 1940s producing Liberty ships for the war effort. From the mid 1950s to 1960, the area was also used for the construction of a number of large offshore oil drilling platforms to support arctic drilling. Nearly every one of these projects required maximum bridge clearance.

A large number of general contractors, fabricators, and other industrial companies utilize the Columbia Business Center's barge facility for river and ocean transportation. Many of these projects also require the highest bridge clearance possible.

The new bridge design may be our region's only chance to ensure future generations the same strategic industrial competitiveness we have now. Do not restrict future jobs and commerce by lowering the passage height of the Columbia River Crossing by less than 125'. The design decisions you make today will possibly last the next 100 years. Please do not choke off the region's future east of I-5 to save a few dollars today.

Thank you for reviewing our information. You and/or your representatives are welcome to tour our facility at any time. If you have any questions, please feel free to contact me.

Sincerely,



John Rudi,
President
Thompson Metal Fab Inc.
360-696-0811
jrudi@tmfab.com


OVERALL: 120' Top of load
50'
50'
20'
On 6/23/2009, River elevation at 6.8 ft.

F-002-001

- **Alaska Ferry Conversion.** In 1973, TMF supplied an exhaust funnel, a solarium structure, and modular subcomponents for the passenger ferry that travels the Inland Passage to Alaska. TMF fabricated the components for this major renovation (the ferry was cut in half and lengthened), and delivered them by barge to the shipyard.

- **Georgia Pacific (Toledo, Oregon) 1,680' Wood Chip Material Handling System.** In 1975, TMF fabricated six 280' tube conveyor sections and all support towers for this project. The completed fabrications were transported by barge to Toledo, Oregon and installed. (See attached photo).

- **Conversion of Barges to Chips & Coke/Soda Ash for Pulp and Paper Mills.** TMF worked on these projects from 1979 to 1981. The converted barges were fabricated to ABS and USCG standards. These projects were installed at our adjacent dock and barge facilities on the Columbia River.

- **ARCO Operation Center Housing Expansion (North Slope, Alaska).** In 1985, TMF fabricated modular super-structures, with bases and decking housing modules, which measured 40' in width by 65' in height by 80' in length. The completed modules were loaded onto a barge standing 65' high and were transported to the North Slope in Alaska. (See attached photo).

- **Newport Bay Floating Restaurant.** In 1986, TMF fabricated a one-piece floating platform to support the waterside restaurant. It was fabricated in the TMF shop and then constructed at the Columbia Business Center barge slip. It was then finally transported to it's final destination in downtown Portland, Oregon.

- **I-90 East Channel Bridge.** In 1986, TMF fabricated trapezoidal tub girders that varied from 98' to 198' in length and weighed between 60 and 200 tons each. TMF pre-assembled the deck on the girders in the Columbia Business Center and the completed components were then loaded on a barge. These were transported to Lake Washington in Seattle and erected off the barge.

- **210' Dry Dock.** In 1987, TMF fabricated a complete 210' dry dock. This included the steel walls and decks, as well as all ballast tanks and piping.

- **Conoco Milne Point Project (North Slope, Alaska).** In 1987, TMF supplied 3,400 tons of fabricated modular steel structures. The completed fabrications required three ocean-going barge loads.

- **Pacific Marine (Honolulu, Hawaii).** In 1989, TMF fabricated a 365-ton SWATH (Small Waterplane Area Twin Hull) excursion vessel. The fabrication consisted of twin cigar-shaped hulls that were 9' in diameter and 132' in length with vessel beams measuring 53'. TMF's location adjacent to the Columbia River proved valuable for launching the vessel. After sea trials, the *Navatek* vessel headed to Hawaii and is still operating today.

F-002-001

- **Parker Drilling Rig 245 - Mobile Oil Drilling.** In 1990, TMF fabricated a self-propelled mobile oil drilling rig. The drilling module was 43' wide by 78' high by 150' long and it weighed 3,000 tons. The utility module was 40' wide by 58' high by 130' long and it weighed 1,500 tons. The cutting module was 30' wide by 30' high by 40' long and it weighed 350 tons. The completed drilling rig was transported by ocean-going barge from TMF's facility to the North Slope in Alaska. (See attached photo).

- **Powell River Paper Company.** In 1991, TMF supplied the fabricated steel for a Chlorine Dioxide Module that measured 35' wide by 76' high by 35' long with a weight of 350 tons. The module was transported by barge in the vertical position (76' high) from TMF's facility to Power River Paper Company in British Columbia, Canada.

- **US Army Corps of Engineers John Day Dam - Upstream Navigation Lock Gate.** This gate was fabricated in 1991 at our location. The gate measured 28' by 80' by 120' and it weighed 105 tons. It was transported standing up (80' high) for installation. (See attached photo).

- **Trapezoidal Steel Tub Bridge Girders for Seattle West Access.** The girders were fabricated at our location in 1992 and transported by barge to Seattle, Washington for erection.

- **Port of Sacramento 1,100' Bulk Material Handling System.** In 1993, TMF fabricated the 275' tube conveyor sections and all support towers. The completed fabrications were transported by barge to the Port of Sacramento.

- **Orthotropic Tub Girders - Nimitz Freeway.** The Cypress Contract "E" consisted of 13 steel curved tub bridge girders for the reconstruction of the Nimitz Freeway in the San Francisco/Oakland Bay area. The total project weighed 6,000 tons. The largest tub girders weighed 450 tons and measured 50' wide by 250' in length. The completed tub girders required 4 ocean-going barges that delivered the tub girders directly to the job site. (See attached photo).

- **Steel Trusses - Portland Expo Center.** In 1995, trusses were fabricated at our location for the expansion of the Portland Expo Center. The completed trusses were transported by barge to the job site in Portland, Oregon.

- **Bridge Fabrication - 1st Avenue & Duwamish Bascule Bridge Replacement.** In 1996, the complete truss section for this project was fabricated and assembled, along with the finish paint, at TMF's facility. This it was transported by barge to the job site in Seattle, Washington. (See attached photo).

- **Tri-Met Pedestrian Bridge.** In 1996, the pedestrian bridge that crosses the Sunset Highway at Highway 217 was fabricated at our location. The completed fabricated sections were

F-002-001

transported by barge to a nearby location and off-loaded. They were then heavy-hauled overland to the job site.

- **Nordic - Calista.** In 1997, TMF fabricated Modular Mobile Oil Drilling Rig 3. The rig included 850 tons of fabricated steel and it was 45' wide by 78' high by 110' long with complete turnkey assembly. The rig was transported by barge to the North Slope in Alaska. (See attached photo).

- **Pre-Heater Tower for La Farge Cement Plant.** In 1997, TMF fabricated this project and it was then transported by barge from the TMF facility to Richmond, British Columbia in Canada.

- **Golmar Explorer Recovery Ship Conversion to Oil Drilling Vessel.** In 1997, TMF fabricated 2 double-bottom sections, 4 thruster tubs, vessel exhaust stacks, and manifold systems for this project. The completed components were transported by barge from the TMF facility to Cascade General Shipyard.

- **PGE Trojan Decommission Nuclear Reactor Project.** In 1998, TMF fabricated a 120-ton transport support structure and 5" thick shielding component enclosures. The completed fabrications were transported by barge from TMF to the job site and the decommissioned reactor was transported from the job site by barge to the final storage site at the Richland, Washington Hanford site.

- **Esperanza 124 MW Power Barge.** In 1999, TMF fabricated and assembled this barge at our facility. It measured 105' in width by 16' in depth by 284' in length with a weight of 1,800 tons. The completed barge was loaded on top of a 400' by 100' barge and transported to Cascade General Shipyard in Portland, Oregon for final assembly and functional operation testing.

- **Removable Spillway Weir Structure for the Army Corps of Engineers - Lower Granite Lock and Dam.** In 2001, this removable spillway weir was designed to move juvenile fish more efficiently downstream through the dam spillways. The weir was 83' wide by 61' in depth by 115' in length and it weighed approximately 1,000 tons. The weir was completely fabricated at TMF and then transported by barge to Cascade General for repositioning. Then, finally, it was delivered to the job site on the Snake River for installation. (see attached photo).

- **Boeing Delta IV Launch Table.** In 2003, TMF fabricated a 580-ton launch table. It measured 98' in length by 33' in height by 46' in width. This project also included large 50 to 120-ton flame deflector components. The launch table and flame deflectors were fully assembled at the TMF facility and transported by barge to Vandenberg Air Force Base in California and then off-loaded and installed at the launch site.

- **Richmond/San Rafael Bridge.** In 2004, TMF supplied 10,000 tons of structural bridge steel for the sub-structure portion of the Richmond/San Rafael Bridge in California. This seismic retrofit

F-002-001

project was fabricated over a 3-year time period. The larger components were transported by barge directly to the job site in the San Francisco/Oakland Bay area.

- **Removable Spillway Weir Structure for the Army Corps of Engineers - Ice Harbor Lock and Dam.** In 2005, this removable spillway weir was designed to move juvenile fish more efficiently through the dam spillways. The unit measured 70' in width by 68' in height by 105' in length and it weighed approximately 950 tons. The weir was completely fabricated at TMF and transported by barge to Cascade General for repositioning and then transported directly to the job site on the Snake River for installation. (see attached photo).

- **Samuel Engineering - Alaska Gold Mining Project.** In 2005, TMF fabricated hoppers, grizzly grates, ball mill chutes, structural supports, modification of the ball mill, and other mining equipment for this project. TMF's facility was used for the marshaling yard and then all of the equipment and fabrications was transported by barge to the mining site in Nome, Alaska.

- **San Francisco/Oakland Bay Bridge Replacement.** In 2006, TMF fabricated two steel orthotropic tub girders that each weighed more than 1,600 tons and measured over 200' in length and 80' in width. The girders were transported by barge directly to the Bay Area for erection.

- **OHSU Portland Aerial Tram.** In 2006, TMF fabricated the center support towers, the lower station and the upper station for the tram project. The major components were transported by barge from TMF to the job site in Portland, Oregon where they were off-loaded and erected.

- **Caltrans - East Tie-In.** TMF was selected by Caltrans (owner) to work with TY-Linn (designer), CC Meyers (contractor), and DCCI (erector) to fabricate 3,100 plus tons of temporary detour steel for the Oakland Bay Bridge at Yerba Vista Island. This project was completed on an extremely "fast track" basis. TMF met, or exceeded, all schedule requirements while maintaining all Caltrans' requirements. The major large components required four barge loads to be transported from TMF to the job site in California. This project was completed in June 2009.

- **Parker Drilling Company/British Petroleum Liberty Oil Drilling Rig (Alaska).** This oil drilling rig was delivered from our facility to the North Slope Alaska in July 2009. TMF furnished approximately 5.5 million pounds of fabricated steel and rig-up support. The rig consisted of three large modules. The Drill Module was 58' wide by 98' high (transport height) by 68' long and weighed 900 tons. The Pipe Barn Module was 158' wide by 45' high by 170' long and it weighed 2,560 tons. Finally, the Drill Service Module was 50' wide by 48' high by 177' long and it weighed 2600 tons. (see attached photo).

- **Parker Drilling AADU Oil Drilling Rigs (272 and 273).** These are currently in the process of being delivered to the North Slope in Alaska. Each drilling rig was comprised of three main modules. The Mud Modules weigh 600 tons; the Drill Modules weigh 700 tons; and the Utility Modules weigh 450 tons (6 modules total). The size of the Mud and Utility modules is 48' wide by 55'

F-002-001

high by 90' long. The Drill Module was 76' high with the mast in the lay-down position. After being loaded on an ocean-going barge, the tie-down blocking added 23' feet to the overall height. Therefore, the final height of the unit on the barge was 99 feet.

Doyon Oil Drilling Rig 25. TMF furnished over 4 million pounds of steel and aluminum fabrication and served as the primary contractor for this job. TMF managed all rig-up yard activities, including mechanical, electrical, and functional checkout. The rig consisted of 6 individual complexes:

-The Power Complex weighed 550 tons and was 56' long by 40' wide by 42' high.
-The Drill Complex weighed 560 tons and was 96' long by 37' wide by 40' high.
-The Pipe Complex weighed 560 tons and was 68' long by 47' wide by 25' high.
-The Mud Complex weighed 550 tons and was 68' long by 40' wide by 49' high.
-The Pump Complex weighed 560 tons and was 64' long by 40' wide by 52' high.
-The Casing Complex weighed 500 tons and was 60' long by 56' wide by 40' high.

There was also a Rig Mast that was 148' long (when fully extended) by 26' wide (at the base) by 25' high. The overall footprint of this project was 265' by 150' and it weighed 6.2 million pounds.

5

THOMPSON METAL FAB, INC.
3000 S.E. Hidden Way
Vancouver, Washington 98661

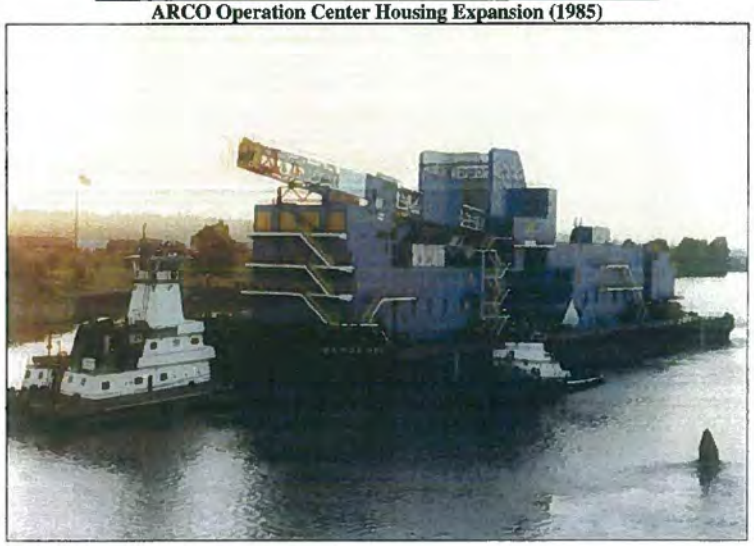
Thompson Metal Fab, Inc. (TMF) has over 70 years of experience in the fabrication of marine related projects.



Georgia Pacific (Toledo, Oregon)—1,680 Foot Wood Chip Material Handling System (1975)



ARCO Operation Center Housing Expansion (1985)



Parker Drill Rig 245 (1990)



Up-Stream Navigational Lock Gate (1991)



Orthotropic Tub Girder Fabrication—Nimitz Freeway (1995)



Bridge Fabrication—1st Avenue & Duwamish (1996)



Nordic – Calista Modular Mobile Oil Drilling Rig 3 (1997)



1,000 Ton Removable Spillway Weir for Lower Granite Dam (2001)

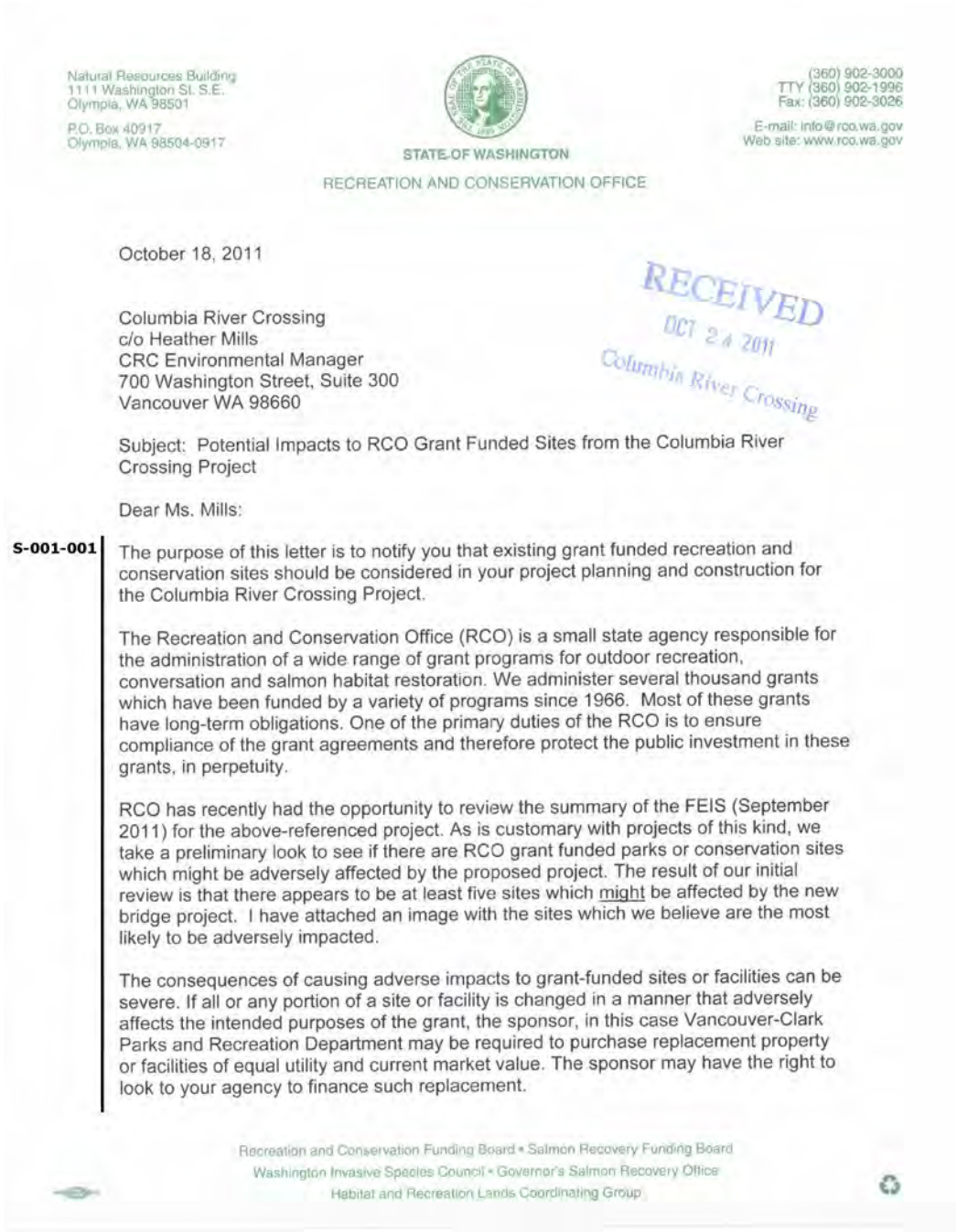


950 Ton Removable Spillway Weir for Ice Harbor Lock and Dam (2005)



Parker Drilling/British Petroleum Liberty Oil Drilling Rig (2009)

11



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Web site: www.rco.wa.gov

STATE OF WASHINGTON

RECREATION AND CONSERVATION OFFICE

October 18, 2011

RECEIVED
OCT 24 2011
Columbia River Crossing

Columbia River Crossing
c/o Heather Mills
CRC Environmental Manager
700 Washington Street, Suite 300
Vancouver WA 98660

Subject: Potential Impacts to RCO Grant Funded Sites from the Columbia River Crossing Project

Dear Ms. Mills:

S-001-001 The purpose of this letter is to notify you that existing grant funded recreation and conservation sites should be considered in your project planning and construction for the Columbia River Crossing Project.

The Recreation and Conservation Office (RCO) is a small state agency responsible for the administration of a wide range of grant programs for outdoor recreation, conversation and salmon habitat restoration. We administer several thousand grants which have been funded by a variety of programs since 1966. Most of these grants have long-term obligations. One of the primary duties of the RCO is to ensure compliance of the grant agreements and therefore protect the public investment in these grants, in perpetuity.

RCO has recently had the opportunity to review the summary of the FEIS (September 2011) for the above-referenced project. As is customary with projects of this kind, we take a preliminary look to see if there are RCO grant funded parks or conservation sites which might be adversely affected by the proposed project. The result of our initial review is that there appears to be at least five sites which might be affected by the new bridge project. I have attached an image with the sites which we believe are the most likely to be adversely impacted.

The consequences of causing adverse impacts to grant-funded sites or facilities can be severe. If all or any portion of a site or facility is changed in a manner that adversely affects the intended purposes of the grant, the sponsor, in this case Vancouver-Clark Parks and Recreation Department may be required to purchase replacement property or facilities of equal utility and current market value. The sponsor may have the right to look to your agency to finance such replacement.

Recreation and Conservation Funding Board • Salmon Recovery Funding Board
Washington Invasive Species Council • Governor's Salmon Recovery Office
Habitat and Recreation Lands Coordinating Group

S-001-001

Thank you for your recent comments on the CRC FEIS. We will include this letter with the other correspondence the project has had with the Washington Recreation and Conservation Office through coordination that began in early 2008. Coordination with RCO has included meetings and conversations with Myra Barker and Kim Sellers. The information you provided in your recent letter is consistent with the information Myra and Kim previously provided. However, there is one error in the map that you provided – Biddlewood Park is shown at the SR 14/ I-5 interchange but it is actually much further east, well outside the project area.

We have also been coordinating with Vancouver City Parks and Recreation staff, including Jane Kleiner-Tessner. Past input from your staff and from City staff has been carefully considered as we advanced the design. The impacts to park and recreation resources are described in the Final EIS and technical reports, and we are confident that the locally preferred alternative can adequately avoid or minimize impacts to the identified resources, and mitigate impacts that cannot be avoided. We look forward to continued coordination with the RCO.

S-001-001 Further research will be required to determine the specific impacts of this project on each particular grant funded site. As you move forward I would suggest that you contact Jim Anest, RCO's Conversion Specialist at (360) 725-3932 and Ms. Jane Tesner Kleiner at the Vancouver-Clark Parks and Recreation Department (360) 487-8313 to discuss these possible impacts.

We look forward to working with you in the near future.

Sincerely,

Scott T. Robinson
Conservation and Grant Services Section Manager

cc: Jim Anest, RCO
Jane Tesner Kleiner, Vancouver Parks and Recreation Department
Heather Ramsay, National Park Service

Attachment- Potential Impacts to RCO Grant Funded Sites from the Columbia River Crossing Project



Burnt Bridge Creek Trail, RCO# 00-1496D
Rose Village Neighborhood Park, RCO# 10-1187A
Biddlewood Park, RCO#92-247A
Leverich Park, RCO# 82-054D
Columbia River Transient Moorage, RCO# 92-388D

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

October 21, 2011

Ms. Heather Wills
CRC Environmental Manager
700 Washington Street, Suite 300
Vancouver, WA 98660



Dear Ms. Wills:

S-002-001 Thank you for the opportunity to comment on the final environmental impact statement for the Interstate 5 Columbia River Crossing project located in Vancouver, Washington and Portland, Oregon. The Department of Ecology (Ecology) reviewed the information provided and has the following comment(s):

SHORELANDS & ENVIRONMENTAL ASSISTANCE:
Rebecca Schroeder (360) 407-7273

Ensure that this project is consistent with the State Shoreline Management Act and the Clark County Shoreline Master Program. Placement of fill in wetlands may require an individual or general (nationwide) permit from the U.S. Army of Corps of Engineers (Corps). We advise the applicant to contact the Corps to determine whether a permit is needed. Should an individual Corps permit be required, a water quality certification will also be required from Ecology. Ecology will therefore provide additional review at that time.

WASTE 2 RESOURCES: Mike Drumright (360) 407-6397

To mitigate the impact of the impervious surfaces resulted from the future development, the applicant may wish to refer to the low impact development strategies in the comprehensive land use plan. You can find the Low Impact Development Technical Manual at the Puget Sound Partnership website http://www.psp.wa.gov/downloads/LID/LID_manual2005.pdf.

Ecology's comments are based upon information provided by the lead agency. As such, they may not constitute an exhaustive list of the various authorizations that must be obtained or legal requirements that must be fulfilled in order to carry out the proposed action.

If you have any questions or would like to respond to these comments, please contact the appropriate reviewing staff listed above.

Department of Ecology
Southwest Regional Office

(SM:11-4640)

cc: Mike Drumright, W2R
Rebecca Schroeder, SEA

S-002-001

The CRC project appreciates the insight on the permits needed prior to construction of the LPA. The CRC project will be submitting applications in accordance with the State Shoreline Management Act and the County's Shoreline Master Program.

An individual permit from the Corps will be sought under Section 404 of the Clean Water Act. In addition, a Section 9 Rivers and Harbors Act permit will be sought. Both these permits will require a Section 401 Clean Water Act Water Quality Certification from Ecology prior to approval. Additional coordination and project review will occur at that time.

Impervious surfaces from future development will comply with existing requirements, including the incorporation of low-impact strategies where practicable, at the time of development.

Oregon

John A. Kitzhaber, MD, Governor

Department of Environmental Quality
Headquarters
811 SW Sixth Avenue
Portland, OR 97204-1390
(503) 229-5696
FAX (503) 229-6124
TTY 711

October 24, 2011

Heather Wills
Columbia River Crossing
700 Washington St., Suite 300
Vancouver, WA 98660

Dear Ms. Wills,

S-003-001

Thank you for the opportunity to comment on the Final Environmental Impact Statement for the Columbia River Crossing (CRC) project. The comments below are related to the sections of the Final Environmental Impact Statement (EIS) with a direct regulatory or technical nexus to DEQ, based on the preliminary information provided in the Final EIS. The comments do not represent all of the potential requirements DEQ may invoke once additional and more specific information concerning environmental media impacts are known about the project. We will work closely with you and the CRC team as more information becomes available.

DEQ appreciates that the CRC project team involved us early on in the technical analysis process, particularly related to Air Quality. Through its involvement with the InterCEP collaboration process, DEQ's Air Quality program had ample and early opportunity to recommend the use of the most appropriate sources of data and analytical methodologies available at the time. DEQ agrees that climate change is an important issue to evaluate and commends the CRC project team for evaluating and disclosing how greenhouse gas emissions would be influenced by the project's changes on transportation. DEQ expects that green house gas emission analysis and mitigation will continue to be incorporated into all aspects of the project.

Since then, DEQ has been working on the Portland Air Toxics Solutions (PATS) project, a community-based effort to improve public health in the Portland area by reducing risk from air toxics. Through an advisory committee, DEQ has been collaborating with local governments, citizens, communities and businesses to reach recommendations on understanding the regional air toxics problems and opportunities to reduce many pollutants from a variety of sources, including mobile sources. While the technical analysis in PATS was similar to that of CRC, it was not identical (different modeling timeframes, different pollutants, etc.), so results from both projects cannot and should not be compared directly. A link to the PATS project can be found at: http://www.deq.state.or.us/aq/toxics/pats.htm, including a recommendation contained in the draft report that DEQ evaluate its emissions inventory based on the final design of the CRC. We look forward to future coordination with the CRC project team, Oregon Department of Transportation (ODOT), Metro and the other local transportation agencies as the project moves forward and to further reduce impacts from mobile sources.

Construction equipment represents the largest source category of diesel emissions in the Portland area. Diesel exhaust is a toxic air contaminant with levels in the Portland area which exceed Oregon health benchmarks. DEQ encourages the CRC project team to consider taking additional steps to incorporate clean diesel practices during the construction phases of the project. DEQ is willing to offer assistance to the CRC project team in exploring options to reduce diesel particulate emissions associated with this project.

S-003-001

The project has committed in the Record of Decision to a number of measures to reduce diesel emissions during construction, as well as to continuing to investigate additional measures that could be implemented. We need to be cognizant of how any added measures affect project costs, contracting, and other considerations, but we look forward to continuing to coordinate with DEQ in this investigation. We plan to investigate emerging technologies as well as other best practices and would appreciate DEQ's assistance, expertise, and input.

S-003-002 Once the proposed final project scope is determined for the CRC project, DEQ will work with the CRC project team, ODOT, and others as appropriate, on stormwater permitting requirements. In addition, if the proposed project requires a Section 404 Clean Water Act Permit from the US Army Corps of Engineers, a 401 Water Quality Certification will be needed from DEQ. DEQ will review the details in the 401 Certification application when available and will provide input at that time.

S-003-003 As you may know, Oregon has regulatory programs for solid waste and hazardous waste that are administered by DEQ. Once the proposed project is determined, DEQ welcomes the opportunity to work with the CRC team, ODOT and other agencies as necessary through an intergovernmental agreement, if appropriate, to provide technical assistance and discuss options for management of solid and hazardous wastes. DEQ can assist with regulatory questions or issues that may be identified during the planning, bidding, preparation and construction work for this project. The work can encompass a review of proposed sampling protocols, characterization and management options for all solid waste (including sediment or soil) as well as options to prevent generation of and management of hazardous waste. In addition, DEQ is available to review and provide input into the various plans that will be developed associated with hazardous and solid waste.

S-003-004 DEQ very much supports the sustainability strategy goals and activities for this project. In particular, the goal to minimize the extraction and consumption of raw materials by promoting reuse and recycling of materials during the project is closely aligned with DEQ's work. Please contact DEQ staff to identify and obtain approval for productive reuse of waste materials through DEQ's recently adopted Beneficial Use Determination rules: http://www.deq.state.or.us/lq/sw/disposal/beneficialuse.htm

S-003-005 Finally, there appears to be at least two ongoing environmental cleanup projects located in the area of the preferred alternative. Depending on the location of the final proposed project, assessment and evaluation of cleanup or other engineering controls may be required if any construction activities are proposed to encroach upon areas of contaminated soil or groundwater. DEQ's Cleanup Program has historically assigned a project manager to work with the local or state government to evaluate known or newly discovered contaminated sites on an expedited basis to ensure protection of human health and the environment. Early coordination with the DEQ regarding this topic should be initiated to ensure staff resources are available for the work in the timelines desired.

Thank you again for the opportunity to provide comments. If you have any questions, please contact Nina DeConcini, DEQ's Administrator for our Northwest Regional Office at 503.229.6271 or deconcini.nina@deq.state.or.us.

Sincerely,



Dick Pedersen
Director

Attachments: PATS Report Recommendations

S-003-002

The CRC project appreciates the insight on the permits needed prior to construction of the LPA. The CRC project will be submitting applications in accordance with Oregon and federal regulations. An individual permit from the Army Corps of Engineers will be sought under Section 404 of the Clean Water Act. In addition, a Section 9 Rivers and Harbors Act permit from the United States Coast Guard will be sought. Both of these permits will require an authorized Section 401 Clean Water Act Water Quality Certification from DEQ prior to approval. Additional coordination and project review will occur prior to and during permit review.

S-003-003

The project understands that ODOT's hazardous materials department would be working with the CRC team and DEQ to discuss options and management of solid and hazardous wastes, resolve related regulatory questions or issues, and obtain input into various plans associated with hazardous and solid waste.

Also, Focused Environmental Assessments (FEAs) would be reviewed and approved by the state DOT hazardous material departments within each respective state (Oregon and Washington). These FEAs will be conducted in areas not covered by Environmental Site Assessments (ESA), Phase 1 or Phase 2 assessments, and will address the potential to encounter hazardous materials at specific sites, impacts of construction on hazardous materials, and any hazardous materials discoveries. As part of the FEA work plan, the DOT hazardous materials departments will coordinate with ODEQ, WDOE, and/or EPA on any hazardous materials discoveries and will implement the response plan.

S-003-004

Thank you for that recommendation regarding compliance with DEQ's Beneficial Use Determination rules.

S-003-005

The project will assume that if it is determined that the location of the final proposed project does encroach upon areas of an ongoing DEQ environmental cleanup project, or a newly discovered site is encountered, that early coordination with the DEQ Cleanup Program would be initiated by ODOT and the CRC team to help ensure DEQ staff resources are available to expedite appropriate actions on a reasonable timeline.

Natural Resources Building
1111 Washington St. S.E.
Olympia, WA 98501

P.O. Box 40917
Olympia, WA 98504-0917

STATE OF WASHINGTON
RECREATION AND CONSERVATION OFFICE

(360) 902-3000
TTY (360) 902-1996
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E-mail: info@rco.wa.gov
Web site: www.rco.wa.gov

October 18, 2011

RECEIVED
OCT 24 2011
Columbia River Crossing

Columbia River Crossing
c/o Heather Mills
CRC Environmental Manager
700 Washington Street, Suite 300
Vancouver WA 98660

Subject: Potential Impacts to RCO Grant Funded Sites from the Columbia River Crossing Project

Dear Ms. Mills:

S-001-001

The purpose of this letter is to notify you that existing grant funded recreation and conservation sites should be considered in your project planning and construction for the Columbia River Crossing Project.

The Recreation and Conservation Office (RCO) is a small state agency responsible for the administration of a wide range of grant programs for outdoor recreation, conversation and salmon habitat restoration. We administer several thousand grants which have been funded by a variety of programs since 1966. Most of these grants have long-term obligations. One of the primary duties of the RCO is to ensure compliance of the grant agreements and therefore protect the public investment in these grants, in perpetuity.

RCO has recently had the opportunity to review the summary of the FEIS (September 2011) for the above-referenced project. As is customary with projects of this kind, we take a preliminary look to see if there are RCO grant funded parks or conservation sites which might be adversely affected by the proposed project. The result of our initial review is that there appears to be at least five sites which might be affected by the new bridge project. I have attached an image with the sites which we believe are the most likely to be adversely impacted.

The consequences of causing adverse impacts to grant-funded sites or facilities can be severe. If all or any portion of a site or facility is changed in a manner that adversely affects the intended purposes of the grant, the sponsor, in this case Vancouver-Clark Parks and Recreation Department may be required to purchase replacement property or facilities of equal utility and current market value. The sponsor may have the right to look to your agency to finance such replacement.

S-001-001

Thank you for your recent comments on the CRC FEIS. We will include this letter with the other correspondence the project has had with the Washington Recreation and Conservation Office through coordination that began in early 2008. Coordination with RCO has included meetings and conversations with Myra Barker and Kim Sellers. The information you provided in your recent letter is consistent with the information Myra and Kim previously provided. However, there is one error in the map that you provided – Biddlewood Park is shown at the SR 14/ I-5 interchange but it is actually much further east, well outside the project area.

We have also been coordinating with Vancouver City Parks and Recreation staff, including Jane Kleiner-Tessner. Past input from your staff and from City staff has been carefully considered as we advanced the design. The impacts to park and recreation resources are described in the Final EIS and technical reports, and we are confident that the locally preferred alternative can adequately avoid or minimize impacts to the identified resources, and mitigate impacts that cannot be avoided. We look forward to continued coordination with the RCO.

S-001-001 Further research will be required to determine the specific impacts of this project on each particular grant funded site. As you move forward I would suggest that you contact Jim Anest, RCO's Conversion Specialist at (360) 725-3932 and Ms. Jane Tesner Kleiner at the Vancouver-Clark Parks and Recreation Department (360) 487-8313 to discuss these possible impacts.

We look forward to working with you in the near future.

Sincerely,

Scott T. Robinson
Conservation and Grant Services Section Manager

cc: Jim Anest, RCO
Jane Tesner Kleiner, Vancouver Parks and Recreation Department
Heather Ramsay, National Park Service

Attachment- Potential Impacts to RCO Grant Funded Sites from the Columbia River Crossing Project



Burnt Bridge Creek Trail, RCO# 00-1496D
Rose Village Neighborhood Park, RCO# 10-1187A
Biddlewood Park, RCO#92-247A
Leverich Park, RCO# 82-054D
Columbia River Transient Moorage, RCO# 92-388D

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

October 21, 2011

Ms. Heather Wills
CRC Environmental Manager
700 Washington Street, Suite 300
Vancouver, WA 98660


Your address is in the Salmon-Washougal watershed

Dear Ms. Wills:

S-002-001 Thank you for the opportunity to comment on the final environmental impact statement for the Interstate 5 Columbia River Crossing project located in Vancouver, Washington and Portland, Oregon. The Department of Ecology (Ecology) reviewed the information provided and has the following comment(s):

SHORELANDS & ENVIRONMENTAL ASSISTANCE:
Rebecca Schroeder (360) 407-7273

Ensure that this project is consistent with the State Shoreline Management Act and the Clark County Shoreline Master Program. Placement of fill in wetlands may require an individual or general (nationwide) permit from the U.S. Army of Corps of Engineers (Corps). We advise the applicant to contact the Corps to determine whether a permit is needed. Should an individual Corps permit be required, a water quality certification will also be required from Ecology. Ecology will therefore provide additional review at that time.

WASTE 2 RESOURCES: Mike Drumright (360) 407-6397

To mitigate the impact of the impervious surfaces resulted from the future development, the applicant may wish to refer to the low impact development strategies in the comprehensive land use plan. You can find the Low Impact Development Technical Manual at the Puget Sound Partnership website http://www.psp.wa.gov/downloads/LID/LID_manual2005.pdf.

Ecology's comments are based upon information provided by the lead agency. As such, they may not constitute an exhaustive list of the various authorizations that must be obtained or legal requirements that must be fulfilled in order to carry out the proposed action.

If you have any questions or would like to respond to these comments, please contact the appropriate reviewing staff listed above.

Department of Ecology
Southwest Regional Office

(SM:11-4640)

cc: Mike Drumright, W2R
Rebecca Schroeder, SEA

S-002-001

The CRC project appreciates the insight on the permits needed prior to construction of the LPA. The CRC project will be submitting applications in accordance with the State Shoreline Management Act and the County's Shoreline Master Program.

An individual permit from the Corps will be sought under Section 404 of the Clean Water Act. In addition, a Section 9 Rivers and Harbors Act permit will be sought. Both these permits will require a Section 401 Clean Water Act Water Quality Certification from Ecology prior to approval. Additional coordination and project review will occur at that time.

Impervious surfaces from future development will comply with existing requirements, including the incorporation of low-impact strategies where practicable, at the time of development.

Oregon

John A. Kitzhaber, MD, Governor

Department of Environmental Quality
Headquarters
811 SW Sixth Avenue
Portland, OR 97204-1390
(503) 229-5696
FAX (503) 229-6124
TTY 711

October 24, 2011

Heather Wills
Columbia River Crossing
700 Washington St., Suite 300
Vancouver, WA 98660

Dear Ms. Wills,

S-003-001

Thank you for the opportunity to comment on the Final Environmental Impact Statement for the Columbia River Crossing (CRC) project. The comments below are related to the sections of the Final Environmental Impact Statement (EIS) with a direct regulatory or technical nexus to DEQ, based on the preliminary information provided in the Final EIS. The comments do not represent all of the potential requirements DEQ may invoke once additional and more specific information concerning environmental media impacts are known about the project. We will work closely with you and the CRC team as more information becomes available.

DEQ appreciates that the CRC project team involved us early on in the technical analysis process, particularly related to Air Quality. Through its involvement with the InterCEP collaboration process, DEQ's Air Quality program had ample and early opportunity to recommend the use of the most appropriate sources of data and analytical methodologies available at the time. DEQ agrees that climate change is an important issue to evaluate and commends the CRC project team for evaluating and disclosing how greenhouse gas emissions would be influenced by the project's changes on transportation. DEQ expects that green house gas emission analysis and mitigation will continue to be incorporated into all aspects of the project.

Since then, DEQ has been working on the Portland Air Toxics Solutions (PATS) project, a community-based effort to improve public health in the Portland area by reducing risk from air toxics. Through an advisory committee, DEQ has been collaborating with local governments, citizens, communities and businesses to reach recommendations on understanding the regional air toxics problems and opportunities to reduce many pollutants from a variety of sources, including mobile sources. While the technical analysis in PATS was similar to that of CRC, it was not identical (different modeling timeframes, different pollutants, etc.), so results from both projects cannot and should not be compared directly. A link to the PATS project can be found at: http://www.deq.state.or.us/aq/toxics/pats.htm, including a recommendation contained in the draft report that DEQ evaluate its emissions inventory based on the final design of the CRC. We look forward to future coordination with the CRC project team, Oregon Department of Transportation (ODOT), Metro and the other local transportation agencies as the project moves forward and to further reduce impacts from mobile sources.

Construction equipment represents the largest source category of diesel emissions in the Portland area. Diesel exhaust is a toxic air contaminant with levels in the Portland area which exceed Oregon health benchmarks. DEQ encourages the CRC project team to consider taking additional steps to incorporate clean diesel practices during the construction phases of the project. DEQ is willing to offer assistance to the CRC project team in exploring options to reduce diesel particulate emissions associated with this project.

S-003-001

The project has committed in the Record of Decision to a number of measures to reduce diesel emissions during construction, as well as to continuing to investigate additional measures that could be implemented. We need to be cognizant of how any added measures affect project costs, contracting, and other considerations, but we look forward to continuing to coordinate with DEQ in this investigation. We plan to investigate emerging technologies as well as other best practices and would appreciate DEQ's assistance, expertise, and input.

S-003-002 Once the proposed final project scope is determined for the CRC project, DEQ will work with the CRC project team, ODOT, and others as appropriate, on stormwater permitting requirements. In addition, if the proposed project requires a Section 404 Clean Water Act Permit from the US Army Corps of Engineers, a 401 Water Quality Certification will be needed from DEQ. DEQ will review the details in the 401 Certification application when available and will provide input at that time.

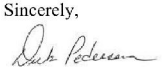
S-003-003 As you may know, Oregon has regulatory programs for solid waste and hazardous waste that are administered by DEQ. Once the proposed project is determined, DEQ welcomes the opportunity to work with the CRC team, ODOT and other agencies as necessary through an intergovernmental agreement, if appropriate, to provide technical assistance and discuss options for management of solid and hazardous wastes. DEQ can assist with regulatory questions or issues that may be identified during the planning, bidding, preparation and construction work for this project. The work can encompass a review of proposed sampling protocols, characterization and management options for all solid waste (including sediment or soil) as well as options to prevent generation of and management of hazardous waste. In addition, DEQ is available to review and provide input into the various plans that will be developed associated with hazardous and solid waste.

S-003-004 DEQ very much supports the sustainability strategy goals and activities for this project. In particular, the goal to minimize the extraction and consumption of raw materials by promoting reuse and recycling of materials during the project is closely aligned with DEQ's work. Please contact DEQ staff to identify and obtain approval for productive reuse of waste materials through DEQ's recently adopted Beneficial Use Determination rules: http://www.deq.state.or.us/lq/sw/disposal/beneficialuse.htm

S-003-005 Finally, there appears to be at least two ongoing environmental cleanup projects located in the area of the preferred alternative. Depending on the location of the final proposed project, assessment and evaluation of cleanup or other engineering controls may be required if any construction activities are proposed to encroach upon areas of contaminated soil or groundwater. DEQ's Cleanup Program has historically assigned a project manager to work with the local or state government to evaluate known or newly discovered contaminated sites on an expedited basis to ensure protection of human health and the environment. Early coordination with the DEQ regarding this topic should be initiated to ensure staff resources are available for the work in the timelines desired.

Thank you again for the opportunity to provide comments. If you have any questions, please contact Nina DeConcini, DEQ's Administrator for our Northwest Regional Office at 503.229.6271 or deconcini.nina@deq.state.or.us.

Sincerely,



Dick Pedersen
Director

Attachments: PATS Report Recommendations

S-003-002

The CRC project appreciates the insight on the permits needed prior to construction of the LPA. The CRC project will be submitting applications in accordance with Oregon and federal regulations. An individual permit from the Army Corps of Engineers will be sought under Section 404 of the Clean Water Act. In addition, a Section 9 Rivers and Harbors Act permit from the United States Coast Guard will be sought. Both of these permits will require an authorized Section 401 Clean Water Act Water Quality Certification from DEQ prior to approval. Additional coordination and project review will occur prior to and during permit review.

S-003-003

The project understands that ODOT's hazardous materials department would be working with the CRC team and DEQ to discuss options and management of solid and hazardous wastes, resolve related regulatory questions or issues, and obtain input into various plans associated with hazardous and solid waste.

Also, Focused Environmental Assessments (FEAs) would be reviewed and approved by the state DOT hazardous material departments within each respective state (Oregon and Washington). These FEAs will be conducted in areas not covered by Environmental Site Assessments (ESA), Phase 1 or Phase 2 assessments, and will address the potential to encounter hazardous materials at specific sites, impacts of construction on hazardous materials, and any hazardous materials discoveries. As part of the FEA work plan, the DOT hazardous materials departments will coordinate with ODEQ, WDOE, and/or EPA on any hazardous materials discoveries and will implement the response plan.

S-003-004

Thank you for that recommendation regarding compliance with DEQ's Beneficial Use Determination rules.

S-003-005

The project will assume that if it is determined that the location of the final proposed project does encroach upon areas of an ongoing DEQ environmental cleanup project, or a newly discovered site is encountered, that early coordination with the DEQ Cleanup Program would be initiated by ODOT and the CRC team to help ensure DEQ staff resources are available to expedite appropriate actions on a reasonable timeline.

CITY OF
PORTLAND
BUREAU OF
TRANSPORTATION

Sam Adams
Mayor

Tom Miller
Director

October 24, 2011

MEMORANDUM

TO: Kris Strickler, Deputy Director
Columbia River Crossing

Heather Wills, Environmental Manager
Columbia River Crossing

FROM: John Gillam, Supervising Planner
City of Portland - Bureau of Transportation

SUBJECT: CRC Final Environmental Impact Statement Review
by the City of Portland Technical Advisory Committee

L-001-001

As required by NEPA, the Columbia River Crossing (CRC) published the Final Environmental Impact Statement (FEIS) for the 30-day public comment period which ends October 24, 2011. On behalf of the City of Portland Technical Advisory Committee (CRC TAC), I have collected and summarized the comments and outstanding issues raised by City bureaus regarding the CRC project.

At the CRC TAC meeting held September 20, 2011, CRC and City staff discussed and agreed upon the value of a memo documenting these issues within the public comment period. The intent of this memo is to identify project issues where we feel clarity from the FEIS is needed and project issues that will require on-going coordination and mutual commitments by CRC and the City to reach successful closure as the project moves forward after the FEIS.

PRIOR PROJECT COMMENTS AND COMMITMENTS

As you are aware, the Portland City Council through Resolution 36618 supported the CRC Locally Preferred Alternative (LPA). This support was provisional. This Council action directed that on-going support of the CRC by the City would be guided by a set of policy statements that outlined the need for further work to be undertaken by the CRC during project development following the LPA.

CRC prepared a Status of Locally Preferred Alternative Conditions for review by the Project Sponsors Council on 2/18/11. For the City of Portland many of these conditions were identified as: "Issue is settled or on track to be settled with the conclusion of the FEIS and ROD but further refinement and decision-making after the FEIS/ROD will be required." It is our expectation that all of these issues will continue to be addressed cooperatively with the City following the FEIS and ROD (Record of Decision).

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L-001-001

CRC will continue to coordinate with the City of Portland on relevant permitting issues and the incorporation of aesthetic considerations into project design. We will also coordinate with the City, as appropriate, on the consideration of a community enhancement fund and a governance structure for managing the river crossing.

Kris Strickler, CRC Deputy Director
Heather Wills, CRC Environmental Manager

October 21, 2011

L-001-001

The City of Portland also supports the commitments offered by the CRC during the discussion of the project with the Metro Council during August and September of this year. The CRC was reviewed by the Metro Council as part of the approval process for the Land Use Final Order (LUFO) for the project. Specifically, we support the commitments discussed in the letter to Metro Council President Hughes from CRC Project Director Nancy Boyd, and Kris Strickler, Deputy Director, dated September 8, 2011. This letter includes specific CRC responses to questions and discussions related to Long-Term and Short-Term Mitigation Measures, FEIS Issues, and Post-FEIS Issues.

Regarding Post-FEIS issues, we want to particularly highlight our strong support of several commitments made by CRC as part of the LUFO process including: (1) creation of a community enhancement fund to mitigate long-term cumulative freeway impacts on adjacent communities, (2) establishment of a governance structure that allows for local participation in performance-based management of the river crossing, and (3) incorporation of aesthetic considerations identified by stakeholder participants in the Urban Design Advisory Group into the project design.

COMMENTS RELATED TO REVIEW OF THE FEIS

L-001-002

Listed below are comments from City bureaus developed during the review of the FEIS and actions needed to move the project forward after the FEIS. These comments are not intended to be considered as FEIS deficiencies or identify lack of impact disclosure.

1. Impacts to natural resources. The project must comply with the City's Environmental Regulations. Within its borders, the City of Portland Zoning Code regulates wetlands, streams, river buffers and other natural resources. Accordingly, environmental review will be required by the City. We request consultation between the CRC and local permitting agencies to review possible mitigation sites within the City. This environmental review process will determine the level of impacts on qualifying resources; unavoidable impacts will require mitigation.

2. Stormwater management and facilities. The project must comply with the City's Stormwater Management Manual. Prior to obtaining the proper site development permits for the Project, City requirements include review of the following: (a) the location of storm water management facilities; (b) the effect upon the performance of the City's storm water system; and (c) potential impacts to the FEMA flood plain designations. Additionally the size, location, engineering design and aesthetics of stormwater treatment facilities must be considered within the context of the goals and community concept of the Hayden Island Plan.

   The Hayden Island Plan anticipated neighborhood-oriented commercial development (retail, services, etc.) on parcels east of the highway and west of N Jantzen Drive. Land use regulations adopted with the plan support this type of development. Recent project designs have shown large stormwater facilities adjacent to the highway on the east in the locations planned for neighborhood commercial development, rendering much of these site non-developable. The CRC should explore stormwater management alternatives with project partners and stakeholders

Page 2 of 5

L-001-002

The CRC project will coordinate with the City on relevant City permitting requirements regarding natural resources and stormwater, related mitigation, design reviews, the Bridgeton Trail extension, other trail designs as appropriate, design of local roadway improvements, plans for minimizing impacts to businesses during construction, and LRT station design. The project is coordinating with the U.S. Army Corps of Engineers regarding impacts to the levy and related permitting.

The transfer of 0.4 acre of surplus land to the City of Vancouver is mitigation for the project's direct impact on the City's existing Waterfront Park, an existing public park and a Section 4(f) resource. The project has no impact to public parks on Hayden Island and therefore no need for such mitigation. The CRC project does not currently propose to convert the existing Thunderbird site on Hayden Island into a public park, but it also does not preclude it from becoming a public park in the future. The project will consider how CRC project design and construction can avoid precluding the ability of the City to build a park there in the future.

The stormwater facilities shown in the FEIS are preliminary in nature and will continue to be refined as design work progresses. Under the terms of the BO, the CRC project must treat stormwater runoff using bioretention, bioslopes, infiltration ponds, porous pavement, constructed wetlands, and vegetated and soil amended swales designed for infiltration. Based on the information we have on file, stormwater runoff is currently not treated before being released to North Portland Harbor or Columbia River.

The Hayden Island Redevelopment Plan states that runoff from local streets will be treated in roadside planters and that CRC stormwater will be managed in a "green, state-of-the-art manner." The stormwater treatment proposed in the FEIS does include the "green streets" approach proposed in the Hayden Island Redevelopment Plan to the

L-001-002

and develop solutions that balance stormwater requirements with planning goals in this urbanized setting.

3. Proposed pier locations at the levees along the south. Protection of the levees along North Portland Harbor, especially along the southerly side, is a significant issue for both the Army Corps of Engineers and the City (to minimize flooding). It is necessary to assure that the Army Corps of Engineers confirms that requirements for levy protection in this area are fully satisfied and that the performance of the levees will protect the area from flooding.

4. Design and permitting reviews. Project elements constructed within City of Portland right-of-way require review at the 30%, 60%, 95% and final pre-construction stages. Along with project plans, these reviews require traffic operations analyses, driveway and local street access plans, and pavement analyses. Upon resolution of review issues, City Engineer Steve Townsen, P.E. will approve the plans for construction. For other project elements, site permits processed by the City's Bureau of Development Services will be required.

5. Multi-use Path. This pedestrian and bicycle facility is a critical element of the CRC. The City supports development of the multi-use path (MUP) on the east side of the highway across North Portland Harbor as part of the northbound on-ramp from the Marine Drive interchange. Section 3.1.3 of the FEIS refers to the commitment of the Project Sponsors Council to implement the recommendations of the Pedestrian and Bicycle Advisory Committee (PBAC). PBAC recommends a 24-foot width path for the "bridge under deck" option for the main river crossing, whereas the FEIS refers to a 16-20 foot path width.

   The City acknowledges that bridge structure limitations may affect the width of the MUP on the river crossing and over North Portland Harbor and looks forward to working with CRC to design a bicycle and pedestrian facility that is as close to the PBAC recommendation as is technically feasible.

6. Bridgeton Trail connection. The City Council LPA Resolution included Policy Statement MD3: "The CRC project shall include an extension of the pedestrian and bicycle facilities to Bridgeton including a first phase construction of the Bridgeton Trail." Part of this first phase of the trail is now being constructed by the City. During the review of LPA conditions CRC staff indicated that trail segments being built as part of the CRC will extend eastward and connect to the segment being built by the City. This commitment is not clear in the FEIS, but it is our expectation that this will be a part of the project. We also look forward to working with CRC to define the design of other trail elements being built as part of the CRC.

7. Traffic impact analysis and road design. Traffic analyses prepared as part of the FEIS has incorporated zoning and future development assumptions prepared for the Hayden Island Plan. Roadway design including the width of streets has been based on these development assumptions along with certain design, safety and vehicle congestion management standards. However, as the CRC moves forward from the

extent feasible. This approach to stormwater treatment is not suitable for streets located under bridges (where it will be difficult to establish plants) or where streets are at or below the seasonal high groundwater table. We will continue to review the developing design to determine whether additional streets lend themselves to this method of runoff treatment.

The possibility of early construction of the local multimodal bridge will continue to be a consideration by the project as project sequencing is refined. It is also discussed in Chapter 2 of the FEIS, (Section 2.3.1), but not as mitigation. Although it is not appropriate to describe the early construction as mitigation, it is discussed as something we will explore as we further refine construction staging. Specifically Section 2.3.1 of the FEIS states:

> Similarly, the Marine Drive interchange construction would need to be coordinated with construction of the southbound lanes coming from Vancouver. While this interchange can be constructed independently from the work described above, the completion and utilization of the ramp system between Hayden Island and Marine Drive requires the work to occur in the same period. Early construction of the local multimodal bridge between Marine Drive and Hayden Island, so that it can be used as an alternate access route during the remaining construction period, will be analyzed during final design. The interchange reconstruction also needs to occur so that Marine Drive can be elevated, allowing the light rail extension to cross under Marine Drive. The Marine Drive interchange is expected to take a little more than 3 years to construct, including work at the Victory Boulevard interchange.

L-001-002

FEIS toward more detailed roadway plans, the City recommends that a broader range of street design objectives be considered. Objectives such as business access and operations, bicycle facilities, pedestrian facilities and street crossings, stormwater management and streetscape elements need to be recognized.

The project features surface street intersections that involve both State and local road authorities, e.g. the City. Consequently, performance of these intersections requires evaluation based on both State and City performance criteria. Refinements of traffic analyses and design decisions should consider any new information including emerging policies such as proposed amendments to the Transportation Planning Rule and Oregon Highway Plan that recognize special considerations for urban places, particularly those areas served by high capacity transit like Hayden Island.

8. Access to local streets and existing business driveways. Section 3.4.3 of the FEIS references Interchange Area Management Plans (IAMPs) under development "in coordination with the City of Portland, ODOT, and other stakeholders." As development of the IAMPs and roadway design details progress, it is important to incorporate the vehicle access needs of existing businesses as a high priority. CRC has expressed willingness to work closely with PBOT regarding design criteria for determining access for local streets and commercial properties.

9. Minimize disruption to local businesses and residents during construction. Section 2.3.1 of the FEIS describes the construction sequencing, duration, and potential detours at construction locations. The City will require submittals from CRC to review construction staging and traffic control plans for handling traffic during construction. Local area circulation and the amount of time residents will experience disruption are significant issues. The City will require that access to and from Hayden Island be maintained at all times throughout the estimated 65-month interchange construction period.

10. LRT station design. City Council Resolution 36618 included Policy Statement HI1: "Provide ultra high-quality LRT station that provides a community focal point and safe, attractive, and accessible pedestrian and bicycle facilities." The CRC has worked closely with the Portland Working Group (PWG) to investigate options and reach consensus on various station design and access facilities which are not clearly represented in the FEIS graphics. The City understands station design and access is a work in progress looks forward to working with CRC and stakeholders to develop progressive levels of detail to meet the design objectives of the PWG.

11. Local arterial bridge. LPA Option A includes a multi-modal bridge connecting Hayden Island to the mainland south of North Portland Harbor. This design includes functions for traffic, trucks, pedestrians, bicycles and transit. Option A is the only option supported by the City. This local arterial bridge is a critical CRC project feature serving the station community area on Hayden Island. The City believes this bridge should be an early construction phase project element.

L-001-002

12. Potential future park site. The community concept section of the Hayden Island Plan identified the area west of I-5 as a potential opportunity site for a waterfront park. As CRC project development progresses, the City recommends that design and property decisions consider the potential for a future park and view point along the north bank of the island as represented in the Hayden Island Plan.

On behalf of the City's CRC TAC, we appreciate the opportunity to provide these comments. Please let us know if you have any questions.



City of Portland Office of Neighborhood Involvement

North Portland Neighborhood Services

2209 N. Schofield Portland Oregon 97217
503.823.4524 503.285.5614 fax
www.npnscommunity.org

Tom Griffin-Valade, Director

Arbor Lodge Bridgeton Cathedral Park East Columbia Kenton Hayden Island Overlook Piedmont Portsmouth St Johns University Park

October 24, 2011

Victor M. Mendez
Administrator
Federal Highway Administration

Peter M Rogoff
Administrator
Federal Transit Administrator

c/o Heather Wills
Columbia River Crossing
700 Washington Street, Suite 300
Vancouver, Washington 98660

L-002-001 The North Portland Chair Network, composed of the leaders representing the eleven North Portland neighborhoods, would like to take this opportunity to express our full support of the position of the North Portland neighborhoods most impacted by the CRC Bridge, Hayden Island, Bridgeton, East Columbia, and Kenton. The residents of these neighborhoods have volunteered many, many hours studying all aspects of the new CRC Bridge.

We have had ongoing concerns that the CRC staff has disregarded and discounted input from residents of these impacted North Portland neighborhoods as well as community advisory groups engaged by the CRC staff. In your evaluation, we urge you to include the intrinsic values of

L-002-002 community support and community pride in your analysis of what type of bridge should be built over the Columbia River.

For the Arbor Lodge, Bridgeton, Friends of Cathedral Park, East Columbia, Kenton, Hayden Island, Overlook, Piedmont, Portsmouth, St Johns, and University Park neighborhood associations chairs,

Tom Griffin-Valade
Director
North Portland Neighborhood Services

L-002-001

Significant work has gone into developing the CRC project, including an ongoing public involvement effort. The public involvement program includes numerous advisory groups to ensure the values and interests of the community are reflected in project decisions. These groups include representatives of public agencies, businesses, civic organizations, and neighborhoods, as well as freight, commuter, and environmental groups. Feedback from the general public and advisory groups has been generally supportive of the project, including support for the transit, bicycle, pedestrian, highway, interchange, and financing elements of the project. See Chapter 2 (Section 2.7) of the FEIS for more discussion on the process used to develop project alternatives and select a Locally Preferred Alternative.

L-002-002

While the selected bridge type is not the one preferred by these commenters, community input and concerns were a factor in making the selection.

Columbia River CROSSING

700 WASHINGTON STREET
SUITE 300
VANCOUVER, WA 98660
360-737-2726 | 503-256-2726

September 8, 2011

Mr. Tom Hughes
Metro Council President
600 NE Grand Avenue
Portland, OR 97232

Dear President Hughes:

L-003-001

In recent weeks, the Columbia River Crossing has been working with Metro staff to address questions regarding mitigation identified in the Final Environmental Impact Statement (FEIS) document and commitments for work activities going forward. Attached is a document that summarizes some of the questions that have been raised, and how we have worked to resolve some of those questions with Metro staff. We are pleased with the coordinated progress we have made.

In the attachment, there are references to "we" and "the project" that are intended to refer to the Columbia River Crossing project, a joint project of the Oregon Department of Transportation and Washington State Department of Transportation. The project team is committed to the actions described in the attachment, and in the FEIS document that is soon to be published by our federal partners.

At your suggestion we have made the following modifications or amendments to the written materials included in the Metro Council's September 6, 2011, Work Session Packet.

- Page 4 – Multi-year construction contracts will include a stipulation requiring that construction equipment and methodology utilize the best available practices, through the life of the project as they become available, to minimize environmental impacts.
- Page 4 – Provided a more clear description of short term vs. long term mitigation for air quality.
- Page 6-7 – Community Enhancement Fund – Added the draft scope of work to this section; and deleted the first paragraph previously attached as part of the scope.

L-003-001

This letter, written by the Columbia River Crossing project, was submitted as public comment by several individuals. The project will continue to coordinate closely with Metro staff and Councilors on these and other issues.

L-003-001 Thank you for the opportunity to discuss the CRC project with you in the Metro Council Work Session. The open and collaborative discussion will help lead to a better project that will benefit the entire region. We sincerely appreciate your efforts to ensure this project moves forward in a way that is considerate and inclusive of Metro, and the interests of the community. We look forward to our work with you as the project proceeds toward construction. As always, we thank you for your support.

Sincerely,

Nancy Boyd
Director

Kris Strickler
Deputy Director

Cc: Metro Councilors

Enclosure

FEIS and post EIS Metro Questions and CRC Responses resulting from August 11, 2011 Metro Council Meeting And September 6, 2011 Metro Council Work Session

Hayden Island Long and Short Term Mitigation in FEIS

L-003-001

The FEIS includes various mitigation measures or offsets that are specific to Hayden Island for long term and short term impacts from the project. Short-term mitigation measures are for impacts identified during construction, while long term mitigation measures constitute post construction commitments or concepts. Below is a list of the mitigation measures and where they can be found in the July 2011 version of the Draft FEIS.

1. Long Term Mitigation (or offsets) for Hayden Island:

   a. Displacements (page 3-91):

      - (All) Purchase property for fair market value as determined through an appraisal and in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended..

   b. Visual (page 3-250):

      - Planting vegetation, street trees, and landscaping for screening or visual quality,
      - Shielding station and facility lighting from nearby residences and the night sky,
      - Minimizing structural bulk, such as for ramps and columns,
      - Designing architectural features to blend with the surrounding community context,
      - Use of public art for transit,
      - Utilization of the UDAG Design Guidelines

   c. Safety (pages 3-64 and 3-250):

      - Transit station will be designed with Crime Prevention Through Environmental Design and will be monitored with police, private security patrols, and security cameras.

L-003-001

2. Short Term (Construction Period) Mitigation for Hayden Island:

a. Air quality (pages 3-262 – 3-263):

- Controlling dust and exhaust emissions from demolition and construction activities,
- Contractors are required to comply with ODOT standard specifications (Section 290) for dust, diesel vehicles, and burning activities described above,
- Follow ODOT's specifications for truck staging areas for diesel-powered vehicles,
- Diesel construction vehicles and equipment will use ultra low sulfur diesel or will otherwise comply with any new, more stringent regulations in place at the time of construction,
- The project will continue to pursue emerging technologies for cleaner construction emissions, like the use of diesel scrubbers for compatible equipment, and continue to encourage and require those types of technologies as bidding laws allow.
- Stationary sources, such as concrete mix and asphalt plants, are generally required to obtain an Air Contaminant Discharge Permit from either DEQ or SWCAA and to comply with regulations for controlling dust and other pollutant emissions.
- Construction materials and activities would be managed to minimize dust, glare and smoke.

b. Noise and vibration (pages 3-295- 3-296):

- Comply with ODOT standard specifications relating to noise, including:
  - Limitation of hours and days on which construction is performed,
  - Equipment using sound-control devices,
  - Equipment comply with EPA noise standards,
  - Establishment of a complaint hotline,
  - Use broadband back-up alarms, or restrict the use of back-up beepers during evening and nighttime hours, and use spotters,
  - Contractor will perform vibration monitoring of all activities that might produce vibration levels,
  - Strategic placement of material stockpiles,
  - If specific noise complaints are received, contractor may be required to:
    - Locate stationary construction equipment as far from nearby noise-sensitive properties as feasible.
    - Shut off idling equipment.
    - Reschedule construction operations to avoid periods of noise annoyance identified in the complaint.
    - Notify nearby residents whenever extremely noisy work will be occurring.

L-003-001

- Install temporary or portable acoustic barriers around stationary construction noise sources.
- Operate electrically powered equipment using line voltage power rather than generators.

c. Commercial impacts (pages 3-65 and 3-115 – 3-116):

- Scheduling construction activities to minimize conflicts during peak travel ,
- Contractor required to obtain approval of traffic control plans,
- Maintain a program of coordination with and outreach to affected business and community interests to oversee the development and implementation of a transportation management plan,
- Establish a telephone complaint and information system to be staffed around the clock by personnel with authority to require the contractor to initiate immediate corrective action,
- Limit or concentrate work areas to minimize disruptions,
- Identify, provide and/or advertise temporary parking locations,
- Relocate affected loading zones, property accesses, bus stops, and other specially designated parking and access points before construction.
- Keeping businesses open and accessible
- Signs to identify the location of access points to businesses
- Business planning assistance
- Contractors coordinate schedule, pace and order of construction to minimize impact to nearby businesses
- Where possible, provide for local contracting opportunities

d. Traffic and transportation (pages 3-157 – 3-158):

- Maintain the existing bus service that regularly connects Hayden Island with nearby grocery and other retail services. This may include additional routing on the island to provide greater transit access during construction.
- Maintain paratransit and a shuttle service for qualifying, mobility impaired Hayden Island residents
- Provide effective detours that minimize out-of-direction travel and delays for travelers, and minimize cut-through traffic.

CRC Responses to specific FEIS issues

L-003-001

1. Replacement of Safeway grocery store

The displacement of Safeway is documented in the FEIS. Mitigation for this impact is governed by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. The project will suggest that Safeway relocate on Hayden Island, but cannot require them to relocate in any specific location. The eventual relocation will be a business decision by Safeway.

We have been informed that there will be a Target grocery store and pharmacy as part of the redevelopment plan for the Jantzen Beach Super Center. We understand that officials representing the Super Center initiated a site plan review with the City of Portland for a relocation and expansion of the Target store. Plans submitted to the City of Portland's Bureau of Development Review indicate that the store could include a grocery and a pharmacy. The plans show, for the Super Center as a whole, a space for a pharmacy, and at least one space for a grocer. We will continue to track this as redevelopment occurs.

2. Mitigating construction impacts such as dust, air pollution, vibration and air quality monitoring on Hayden Island

a. See Hayden Island Short and Long Term mitigation section above.
b. Multi-year construction contracts will include a stipulation requiring that construction equipment and methodology utilize the best available practices, through the life of the project as they become available, to minimize environmental impacts.
c. Air quality monitoring:

We understand there is a desire for air quality monitoring on Hayden Island during construction and long term. With the LPA, air quality is predicted to be better than in the no-build condition due to project improvements and fleet changes, therefore the project is not providing additional long term mitigation for air quality impacts beyond the elements of the project itself that will produce a reduction of vehicle emissions through the use of alternative modes and less congestion and bridge lift related idling (short term mitigation is discussed previously). In addition, air quality monitoring is not considered a form of mitigation, because the toxin source cannot be identified accurately. For some types of air toxics, such as diesel particulates, no direct measurement methods exist.

Finally, monitoring of Mobile Source Air Toxics (MSAT's) within a project corridor would yield data results that would be inconclusive in terms of health risk since short term and long term exposure limits or concentration levels have not yet been identified by the EPA. Issues that affect the accuracy of the health risks were also discussed in the air quality report for the CRC.

3. Early construction of the local bridge as a mitigation measure during the construction period

L-003-001

The possibility of early construction of the local multimodal bridge will continue to be a consideration by the project as project sequencing is refined. It is also discussed in Chapter 2 of the Draft FEIS, (Section 2.3.1), but not as mitigation. Although it is not appropriate to describe the early construction as mitigation, it is discussed as something we will explore as we further refine construction staging. Specifically it reads:

Similarly, the Marine Drive interchange construction would need to be coordinated with construction of the southbound lanes coming from Vancouver. While this interchange can be constructed independently from the work described above, the completion and utilization of the ramp system between Hayden Island and Marine Drive requires the work to occur in the same period. Early construction of the local multimodal bridge between Marine Drive and Hayden Island, so that it can be used as an alternate access route during the remaining construction period, will be analyzed during final design. The interchange reconstruction also needs to occur so that Marine Drive can be elevated, allowing the light rail extension to cross under Marine Drive. The Marine Drive interchange is expected to take a little more than 3 years to construct, including work at the Victory Boulevard interchange.

4. Review of the Finance Chapter of the FEIS (incorporate recommendations from the OST)

The project has incorporated the treasurer's recommendations to reduce financial risk and provide a more conservative finance plan. The updated financial chapter in the FEIS includes a recalibrated tolling financial projection to reflect the stalled economic growth and a level debt service. The treasurer's office is currently reviewing the FEIS financial chapters for consistency with his recommendations. The CRC will submit a finance chapter that reflects the treasurer's recommendations and the Federal Transit Administration and Federal Highway Administration will provide final approval of the finance chapter for FEIS publication.

5. Inclusion of the Bike/Ped Safety and Security Plan in the FEIS

We have included new language in 2.2.3 Pedestrian and Bicycle Improvements. We also refer the reader to the Memo from the Pedestrian and Bicycle Advisory Committee to the project and letter from the project accepting these recommendations. The new language reads:

Safety and Security

A maintenance and security program for the multi-use pathway would be established. It could include some or all of the following, as well as additional, elements:

- Identification of reliable funding sources and responsible parties for maintenance and security
- Commitment of reliable funding sources and responsible parties for maintenance and security
- Demand responsive and prompt facility management and maintenance
- Opportunities to "program the space" and support activity (e.g., kiosks, overlooks, vendor opportunities) to provide "eyes on the pathway"
- Ensure 24 hours a day, seven days a week pedestrian and bicycle access to and across the bridge and its connecting pathways

L-003-001

- Visible and regular on-site monitoring by law enforcement officers or security staff
- Security cameras monitored by law enforcement officers or security staff
- Call boxes to enable bridge users to report immediate maintenance needs and security concerns
- Efficient, sufficient, vandal-proof, no glare and dark skies compliant clear, crisp, white LED lighting
- Clearly posted laws and ordinances
- Advance notification and posting of maintenance closures and detours
- Citizen and volunteer participation shall be encouraged for future maintenance, operations and programming

CRC Responses to Post EIS Issues

1. Disposition of the former Thunderbird Hotel site after use as a construction staging area as a park

   The process for the final decisions regarding the disposition of any surplus property is made following the completion of construction. The potential uses of this specific site as a park and its potential to be declared surplus property will be discussed and coordinated with residents, local property owners and project partners.

2. Establish an approach to considering a park and ride lot on Hayden Island

   Further discussion regarding a park and ride on Hayden Island will occur as the project design is further developed after the Record of Decision. Compared to current transit access, the LPA represents a 25% driving distance reduction for a typical Hayden Island resident to access a park and ride facility and without having to use the freeway system. Please note the City of Portland's Hayden Island Plan designates the MAX station area as a mixed use district. Generally, TriMet and the City of Portland policies do not support siting park & rides in existing or planned mixed-use districts.

3. Commit to development of a community enhancement fund proposal

   In the last three years the CRC project team, the Project Sponsors Council, and CRC advisory groups have focused on incorporating a wide range of community enhancements into the project. The project has looked for ways to leverage the highway and transit investments into additional improvements for project neighbors and local communities. These improvements are beyond the benefits identified as the project's purpose and need. These tangible improvements include: improved local street connections in downtown Vancouver; new local roads and improved local flow and connections for Hayden Island residents; better bike and pedestrian access to the improved facilities; new bike and pedestrian trails; and a separate bridge for local auto access from North Portland to Hayden Island.

   We know there is more to be done. The CRC remains committed to aggressively maximizing and leveraging resources to bring additional benefits and improvements to our community. Two options have been identified for further exploration, both include a financial set aside of a

L-003-001

specific amount dedicated to a specific purpose. One approach is a project specific community enhancement fund. There is some history with such an approach - the Delta Park I-5 widening project (2006) and Metro's solid waste program (1991) are two examples. The other approach is a different concept, a regional fund established by the state to benefit the neighborhoods and communities in close proximity to I-5 and the CRC project. Both approaches have been successfully implemented in the Portland region and will help inform this effort.

We need to be clear about both of these approaches – neither will be easy. Both approaches have limitations and legal restrictions associated with anticipated funding sources. Both will require legislative support. Both will likely need enabling legislation and both will require funding. To be successful will require a clear purpose with obvious benefits and very broad support.

We appreciate the attention and focus that the Metro Council has maintained on this issue. The CRC is committed to working with Metro and project partners to: develop a clear need or problem statement; review and advance a program that addresses the needs statement with funding sources or opportunities identified; and, submit the program concept(s) to the Oregon legislatures in 2012 or 2013. The work scope to carry this out is defined below:

Community Enhancement Fund Scope of Work/Work Plan

- Development of Purpose and Goals of the Community Enhancement Fund.
- Definition of a policy basis for establishing the fund.
- Investigation of existing programs, including implementing agencies, legal structure, decision-making structure and criteria, project eligibility, accountability and summary of actual projects implemented.
- Definition and evaluation of alternative organizational and governance structures for administration of the fund and minimum requirements for representation on enhancement fund project selection committees. Consideration of alternative approaches for administration, including in-house, through an existing foundation (such as Oregon Community Foundation or Meyer Memorial Trust) or creation of a special purpose non-profit organization.
- Definition of community enhancement fund project eligibility and required vs. optional selection criteria.
- Investigation of legal restrictions of various potential funding sources under federal, state, regional and local authority and funding limitations. Identification of potential legislation required for implementation.
- Definition of mechanisms to ensure accountability of expenditure of public funds.

4. Establish how phasing will be defined and Metro will be involved

The CRC has always anticipated that construction of the entire project would require several years and would be phased to provide the most efficient implementation while minimizing impacts on the community and corridor users. Project engineers began months ago reviewing

L-003-001

engineering realities associated with keeping the facility open for users and bringing key elements such as light rail transit on line as expeditiously as possible.

While the engineering work on phasing was in progress, the project team also began an update of the financial analysis for the FEIS. That work dovetailed with the governor's request to the state treasurer to undertake an independent review of the CRC's "financial options, an assessment of strengths and weaknesses, as well as project phasing schedules with contingency plans if some of the funding does not materialize."

The state treasurer's review provides more clarity as well as updated information on the finances available for project implementation and the flow of those resources. In addition to the treasurer's work, the governor went further and signaled that he expects the CRC to start planning for a project that "adapts to available resources and fits into today's economic reality."

Capturing the work of the state treasurer and recognizing the changing economic realities, the CRC has begun an intensive work plan overlaying the engineering phasing with anticipated cash flow and funding realities. We have been asked to have this work ready for review and discussion by the interim legislative committees in both states. We anticipate that this work will have a full and complete public review and discussion, which will include Metro and other project partners.

The project is also incorporating the treasurer's recommendations to reduce financial risk and provide a more conservative finance plan. This more conservative approach will help inform the CRC's sequencing plans. The updated financial chapter in the FEIS will include a recalibrated tolling financial projection to reflect the stalled economic growth and a level debt service. Further financial scrutiny and certainty will result from an investment grade analysis that will occur prior to the initial sale of bonds.

5. Establish how governance of the project after completion will be determined and how Metro will be involved

In 2010, the Project Sponsors Council began discussing a set of complicated policy issues dealing with the management of this multi-modal facility. To facilitate a more in-depth review of some of these "governance" issues, a 14-member work group comprised of partner agencies, including Metro, was formed and chaired by Henry Hewitt and Steve Horenstein. The work group agenda includes developing options to implement a structure for on-going governance and project management in the periods before, during and after construction.

To help inform these discussions, WSDOT, ODOT, state DOJ/AG's, and the CRC are currently identifying key legal issues between the states and developing corresponding terms and conditions that will ultimately form the intergovernmental agreements. This scope of work includes:

- Reviewing existing bi-state agreements, decision matrix, and supporting documents;
- Reviewing state authority for Oregon and Washington;

L-003-001

- Developing proposals and options for governing structure for toll setting and administration, including how it would work with the Oregon and Washington Transportation Commissions;
- Developing proposals for debt allocations, including identification of needed legislation; and
- Identifying issues that may need resolution through new state or federal legislation.

The Oregon treasurer's July 20, 2011, report confirms the CRC focus with a finding that the CRC's governance plan must include a robust toll setting mechanism to assure that all toll-related debt service is paid in full each year through toll revenues.

The legal review and findings currently underway will serve as foundation for the governance work group as it develops options on possible governance models. This work must result in a governance model that will build confidence with the bond markets.

The probability that state legislation will be required in Washington and Oregon requires substantial progress on key governance issues in the next year. The CRC is working on a timeline and work plan for identifying and resolving the legal, policy and political issues on management of the facility. The specific schedule for which work when will be developed in response to the timelines associated with legislative action and bonding.

A report entitled "Columbia River Crossing, Cross-Jurisdictional Laws, Governance and Funding" has been distributed to Metro staff as further information on this topic as well. The report was originally prepared for the Washington State Legislature pursuant to ESSB 6381.

6. Establish how the finance plan will be refined and implemented over time and how Metro will be involved, including when there will be a decision on collection of tolls during construction

The financial plan for the CRC project is a combination of state, federal and local contributions. The general basis of that plan is not anticipated to fundamentally change but will be flexible in response to timing of available revenue. It is the project's intent to seek funding that does not jeopardize other regional priorities.

Specifically related to the federal dollars being contemplated, the project will pursue FHWA highway discretionary funding and FTA Section 5309 funds through the competitive New Starts process. The funding contribution being pursued is $400 million in highway funds, and $850 million through New Starts. Work on this portion of the plan will continue through the Preliminary Engineering, Final Design and the Full Funding Grant Agreement phases of the project. The project anticipates applying to enter into Final Design by early summer 2012, and hopes to begin receiving grant funds prior to construction starting in 2013.

The state funding participation is anticipated to be in the amount of $450 million each from Washington and Oregon. Initial requests will begin in the legislative sessions for 2012 and/or 2013, with state funds being allocated prior to construction in late 2013. The CRC looks

L-003-001

forward to continued partner agency support, including Metro, in the quest for state funds for this important project.

The local participation described above will be pursued as tolls on the new crossing. The authorization to toll will be a topic in the 2012 Washington legislative session, and toll bond sales are anticipated to begin upon completion of the toll investment grade analysis, currently planned for 2013. Toll bond covenants will require that toll revenues are first used for the following: debt service, reasonable return on private investment, and operation and maintenance, including reconstructing, resurfacing, restoring and rehabilitating work, among other things.

The recently released analysis by the Oregon Treasurer advanced the idea of pre-completion tolling to help achieve sufficient revenues. Further discussion of tolling during the construction phase will likely be raised during the engagement process with the legislatures, and pending governance discussions will need to be resolved to implement tolling.

7. Establish how aesthetic considerations will be incorporated into the design and how Metro will be involved

Governor Kitzhaber is working on a proposal to appoint a bi-state committee to review and select an architect and a bi-state bridge design advisory committee to work with the architect and public. The draft work plan is still in progress but is guided by the following:

"Moving forward the project requires highly qualified, exceptionally skilled, visionary design leadership that understands the importance of design in delivering a project that is worthy of the majestic setting and serves the needs of the citizens." UDAG

A joint governor appointed independent selection committee will review qualifications and recommend a qualified bridge architect to work with stakeholders, the urban design community, public, and project staff to develop conceptual designs, standards and/or criteria that will be the included in any bridge construction procurement documents. This firm or person could be retained throughout the design and construction of the bridge to develop, explain, and work with the design/builder to ensure that the final bridge design includes these standards and criteria.

The architect(s) would:

- Develop the aesthetic response to the crossing over the Columbia;
- Include the Harbor bridge(s) and the Hayden Island and SR 14 interchanges;
- Create increased certainty in the community about the conceptual design;
- Develop the design standards and/or criteria for inclusion in the bridge design-build RFP; and
- Provide consistency for the aesthetic design throughout the design-build process.

The architect will work with a group of stakeholders to develop conceptual designs, engage the public on design concepts, and approve the architectural standards and/or criteria for inclusion in design-build RFP and procurement documents. The members will represent diverse bridge

L-003-001

and bridge corridor stakeholders including, but not limited to: freight, marine, bike/ped, neighbors, commuters, transit and design community.

This work is in progress and is guided by providing adequate time to inform the design-build procurement schedule.

CITY OF
PORTLAND
BUREAU OF
TRANSPORTATION

Sam Adams
Mayor

Tom Miller
Director

October 24, 2011

MEMORANDUM

TO: Kris Strickler, Deputy Director
Columbia River Crossing

Heather Wills, Environmental Manager
Columbia River Crossing

FROM: John Gillam, Supervising Planner
City of Portland - Bureau of Transportation

SUBJECT: CRC Final Environmental Impact Statement Review
by the City of Portland Technical Advisory Committee

L-001-001

As required by NEPA, the Columbia River Crossing (CRC) published the Final Environmental Impact Statement (FEIS) for the 30-day public comment period which ends October 24, 2011. On behalf of the City of Portland Technical Advisory Committee (CRC TAC), I have collected and summarized the comments and outstanding issues raised by City bureaus regarding the CRC project.

At the CRC TAC meeting held September 20, 2011, CRC and City staff discussed and agreed upon the value of a memo documenting these issues within the public comment period. The intent of this memo is to identify project issues where we feel clarity from the FEIS is needed and project issues that will require on-going coordination and mutual commitments by CRC and the City to reach successful closure as the project moves forward after the FEIS.

PRIOR PROJECT COMMENTS AND COMMITMENTS

As you are aware, the Portland City Council through Resolution 36618 supported the CRC Locally Preferred Alternative (LPA). This support was provisional. This Council action directed that on-going support of the CRC by the City would be guided by a set of policy statements that outlined the need for further work to be undertaken by the CRC during project development following the LPA.

CRC prepared a Status of Locally Preferred Alternative Conditions for review by the Project Sponsors Council on 2/18/11. For the City of Portland many of these conditions were identified as: "Issue is settled or on track to be settled with the conclusion of the FEIS and ROD but further refinement and decision-making after the FEIS/ROD will be required." It is our expectation that all of these issues will continue to be addressed cooperatively with the City following the FEIS and ROD (Record of Decision).

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L-001-001

CRC will continue to coordinate with the City of Portland on relevant permitting issues and the incorporation of aesthetic considerations into project design. We will also coordinate with the City, as appropriate, on the consideration of a community enhancement fund and a governance structure for managing the river crossing.

Kris Strickler, CRC Deputy Director
Heather Wills, CRC Environmental Manager

October 21, 2011

L-001-001

The City of Portland also supports the commitments offered by the CRC during the discussion of the project with the Metro Council during August and September of this year. The CRC was reviewed by the Metro Council as part of the approval process for the Land Use Final Order (LUFO) for the project. Specifically, we support the commitments discussed in the letter to Metro Council President Hughes from CRC Project Director Nancy Boyd, and Kris Strickler, Deputy Director, dated September 8, 2011. This letter includes specific CRC responses to questions and discussions related to Long-Term and Short-Term Mitigation Measures, FEIS Issues, and Post-FEIS Issues.

Regarding Post-FEIS issues, we want to particularly highlight our strong support of several commitments made by CRC as part of the LUFO process including: (1) creation of a community enhancement fund to mitigate long-term cumulative freeway impacts on adjacent communities, (2) establishment of a governance structure that allows for local participation in performance-based management of the river crossing, and (3) incorporation of aesthetic considerations identified by stakeholder participants in the Urban Design Advisory Group into the project design.

COMMENTS RELATED TO REVIEW OF THE FEIS

L-001-002

Listed below are comments from City bureaus developed during the review of the FEIS and actions needed to move the project forward after the FEIS. These comments are not intended to be considered as FEIS deficiencies or identify lack of impact disclosure.

1. Impacts to natural resources. The project must comply with the City's Environmental Regulations. Within its borders, the City of Portland Zoning Code regulates wetlands, streams, river buffers and other natural resources. Accordingly, environmental review will be required by the City. We request consultation between the CRC and local permitting agencies to review possible mitigation sites within the City. This environmental review process will determine the level of impacts on qualifying resources; unavoidable impacts will require mitigation.

2. Stormwater management and facilities. The project must comply with the City's Stormwater Management Manual. Prior to obtaining the proper site development permits for the Project, City requirements include review of the following: (a) the location of storm water management facilities; (b) the effect upon the performance of the City's storm water system; and (c) potential impacts to the FEMA flood plain designations. Additionally the size, location, engineering design and aesthetics of stormwater treatment facilities must be considered within the context of the goals and community concept of the Hayden Island Plan.

   The Hayden Island Plan anticipated neighborhood-oriented commercial development (retail, services, etc.) on parcels east of the highway and west of N Jantzen Drive. Land use regulations adopted with the plan support this type of development. Recent project designs have shown large stormwater facilities adjacent to the highway on the east in the locations planned for neighborhood commercial development, rendering much of these site non-developable. The CRC should explore stormwater management alternatives with project partners and stakeholders

Page 2 of 5

L-001-002

The CRC project will coordinate with the City on relevant City permitting requirements regarding natural resources and stormwater, related mitigation, design reviews, the Bridgeton Trail extension, other trail designs as appropriate, design of local roadway improvements, plans for minimizing impacts to businesses during construction, and LRT station design. The project is coordinating with the U.S. Army Corps of Engineers regarding impacts to the levy and related permitting.

The transfer of 0.4 acre of surplus land to the City of Vancouver is mitigation for the project's direct impact on the City's existing Waterfront Park, an existing public park and a Section 4(f) resource. The project has no impact to public parks on Hayden Island and therefore no need for such mitigation. The CRC project does not currently propose to convert the existing Thunderbird site on Hayden Island into a public park, but it also does not preclude it from becoming a public park in the future. The project will consider how CRC project design and construction can avoid precluding the ability of the City to build a park there in the future.

The stormwater facilities shown in the FEIS are preliminary in nature and will continue to be refined as design work progresses. Under the terms of the BO, the CRC project must treat stormwater runoff using bioretention, bioslopes, infiltration ponds, porous pavement, constructed wetlands, and vegetated and soil amended swales designed for infiltration. Based on the information we have on file, stormwater runoff is currently not treated before being released to North Portland Harbor or Columbia River.

The Hayden Island Redevelopment Plan states that runoff from local streets will be treated in roadside planters and that CRC stormwater will be managed in a "green, state-of-the-art manner." The stormwater treatment proposed in the FEIS does include the "green streets" approach proposed in the Hayden Island Redevelopment Plan to the

L-001-002

and develop solutions that balance stormwater requirements with planning goals in this urbanized setting.

3. Proposed pier locations at the levees along the south. Protection of the levees along North Portland Harbor, especially along the southerly side, is a significant issue for both the Army Corps of Engineers and the City (to minimize flooding). It is necessary to assure that the Army Corps of Engineers confirms that requirements for levy protection in this area are fully satisfied and that the performance of the levees will protect the area from flooding.

4. Design and permitting reviews. Project elements constructed within City of Portland right-of-way require review at the 30%, 60%, 95% and final pre-construction stages. Along with project plans, these reviews require traffic operations analyses, driveway and local street access plans, and pavement analyses. Upon resolution of review issues, City Engineer Steve Townsen, P.E. will approve the plans for construction. For other project elements, site permits processed by the City's Bureau of Development Services will be required.

5. Multi-use Path. This pedestrian and bicycle facility is a critical element of the CRC. The City supports development of the multi-use path (MUP) on the east side of the highway across North Portland Harbor as part of the northbound on-ramp from the Marine Drive interchange. Section 3.1.3 of the FEIS refers to the commitment of the Project Sponsors Council to implement the recommendations of the Pedestrian and Bicycle Advisory Committee (PBAC). PBAC recommends a 24-foot width path for the "bridge under deck" option for the main river crossing, whereas the FEIS refers to a 16-20 foot path width.

   The City acknowledges that bridge structure limitations may affect the width of the MUP on the river crossing and over North Portland Harbor and looks forward to working with CRC to design a bicycle and pedestrian facility that is as close to the PBAC recommendation as is technically feasible.

6. Bridgeton Trail connection. The City Council LPA Resolution included Policy Statement MD3: "The CRC project shall include an extension of the pedestrian and bicycle facilities to Bridgeton including a first phase construction of the Bridgeton Trail." Part of this first phase of the trail is now being constructed by the City. During the review of LPA conditions CRC staff indicated that trail segments being built as part of the CRC will extend eastward and connect to the segment being built by the City. This commitment is not clear in the FEIS, but it is our expectation that this will be a part of the project. We also look forward to working with CRC to define the design of other trail elements being built as part of the CRC.

7. Traffic impact analysis and road design. Traffic analyses prepared as part of the FEIS has incorporated zoning and future development assumptions prepared for the Hayden Island Plan. Roadway design including the width of streets has been based on these development assumptions along with certain design, safety and vehicle congestion management standards. However, as the CRC moves forward from the

extent feasible. This approach to stormwater treatment is not suitable for streets located under bridges (where it will be difficult to establish plants) or where streets are at or below the seasonal high groundwater table. We will continue to review the developing design to determine whether additional streets lend themselves to this method of runoff treatment.

The possibility of early construction of the local multimodal bridge will continue to be a consideration by the project as project sequencing is refined. It is also discussed in Chapter 2 of the FEIS, (Section 2.3.1), but not as mitigation. Although it is not appropriate to describe the early construction as mitigation, it is discussed as something we will explore as we further refine construction staging. Specifically Section 2.3.1 of the FEIS states:

> Similarly, the Marine Drive interchange construction would need to be coordinated with construction of the southbound lanes coming from Vancouver. While this interchange can be constructed independently from the work described above, the completion and utilization of the ramp system between Hayden Island and Marine Drive requires the work to occur in the same period. Early construction of the local multimodal bridge between Marine Drive and Hayden Island, so that it can be used as an alternate access route during the remaining construction period, will be analyzed during final design. The interchange reconstruction also needs to occur so that Marine Drive can be elevated, allowing the light rail extension to cross under Marine Drive. The Marine Drive interchange is expected to take a little more than 3 years to construct, including work at the Victory Boulevard interchange.

L-001-002

FEIS toward more detailed roadway plans, the City recommends that a broader range of street design objectives be considered. Objectives such as business access and operations, bicycle facilities, pedestrian facilities and street crossings, stormwater management and streetscape elements need to be recognized.

The project features surface street intersections that involve both State and local road authorities, e.g. the City. Consequently, performance of these intersections requires evaluation based on both State and City performance criteria. Refinements of traffic analyses and design decisions should consider any new information including emerging policies such as proposed amendments to the Transportation Planning Rule and Oregon Highway Plan that recognize special considerations for urban places, particularly those areas served by high capacity transit like Hayden Island.

8. Access to local streets and existing business driveways. Section 3.4.3 of the FEIS references Interchange Area Management Plans (IAMPs) under development "in coordination with the City of Portland, ODOT, and other stakeholders." As development of the IAMPs and roadway design details progress, it is important to incorporate the vehicle access needs of existing businesses as a high priority. CRC has expressed willingness to work closely with PBOT regarding design criteria for determining access for local streets and commercial properties.

9. Minimize disruption to local businesses and residents during construction. Section 2.3.1 of the FEIS describes the construction sequencing, duration, and potential detours at construction locations. The City will require submittals from CRC to review construction staging and traffic control plans for handling traffic during construction. Local area circulation and the amount of time residents will experience disruption are significant issues. The City will require that access to and from Hayden Island be maintained at all times throughout the estimated 65-month interchange construction period.

10. LRT station design. City Council Resolution 36618 included Policy Statement HI1: "Provide ultra high-quality LRT station that provides a community focal point and safe, attractive, and accessible pedestrian and bicycle facilities." The CRC has worked closely with the Portland Working Group (PWG) to investigate options and reach consensus on various station design and access facilities which are not clearly represented in the FEIS graphics. The City understands station design and access is a work in progress looks forward to working with CRC and stakeholders to develop progressive levels of detail to meet the design objectives of the PWG.

11. Local arterial bridge. LPA Option A includes a multi-modal bridge connecting Hayden Island to the mainland south of North Portland Harbor. This design includes functions for traffic, trucks, pedestrians, bicycles and transit. Option A is the only option supported by the City. This local arterial bridge is a critical CRC project feature serving the station community area on Hayden Island. The City believes this bridge should be an early construction phase project element.

L-001-002

12. Potential future park site. The community concept section of the Hayden Island Plan identified the area west of I-5 as a potential opportunity site for a waterfront park. As CRC project development progresses, the City recommends that design and property decisions consider the potential for a future park and view point along the north bank of the island as represented in the Hayden Island Plan.

On behalf of the City's CRC TAC, we appreciate the opportunity to provide these comments. Please let us know if you have any questions.

City of Portland Office of Neighborhood Involvement
North Portland Neighborhood Services
2209 N. Schofield Portland Oregon 97217
503.823.4524 503.285.5614 fax
www.npnscommunity.org

Tom Griffin-Valade, Director
Arbor Lodge Bridgeton Cathedral Park East Columbia Kenton Hayden Island Overlook Piedmont Portsmouth St Johns University Park

October 24, 2011

Victor M. Mendez
Administrator
Federal Highway Administration

Peter M Rogoff
Administrator
Federal Transit Administrator

c/o Heather Wills
Columbia River Crossing
700 Washington Street, Suite 300
Vancouver, Washington 98660

L-002-001 The North Portland Chair Network, composed of the leaders representing the eleven North Portland neighborhoods, would like to take this opportunity to express our full support of the position of the North Portland neighborhoods most impacted by the CRC Bridge, Hayden Island, Bridgeton, East Columbia, and Kenton. The residents of these neighborhoods have volunteered many, many hours studying all aspects of the new CRC Bridge.

We have had ongoing concerns that the CRC staff has disregarded and discounted input from residents of these impacted North Portland neighborhoods as well as community advisory groups engaged by the CRC staff. In your evaluation, we urge you to include the intrinsic values of community support and community pride in your analysis of what type of bridge should be built over the Columbia River. **L-002-002**

For the Arbor Lodge, Bridgeton, Friends of Cathedral Park, East Columbia, Kenton, Hayden Island, Overlook, Piedmont, Portsmouth, St Johns, and University Park neighborhood associations chairs,

Tom Griffin-Valade
Director
North Portland Neighborhood Services

L-002-001

Significant work has gone into developing the CRC project, including an ongoing public involvement effort. The public involvement program includes numerous advisory groups to ensure the values and interests of the community are reflected in project decisions. These groups include representatives of public agencies, businesses, civic organizations, and neighborhoods, as well as freight, commuter, and environmental groups. Feedback from the general public and advisory groups has been generally supportive of the project, including support for the transit, bicycle, pedestrian, highway, interchange, and financing elements of the project. See Chapter 2 (Section 2.7) of the FEIS for more discussion on the process used to develop project alternatives and select a Locally Preferred Alternative.

L-002-002

While the selected bridge type is not the one preferred by these commenters, community input and concerns were a factor in making the selection.

Columbia River CROSSING

700 WASHINGTON STREET
SUITE 300
VANCOUVER, WA 98660
360-737-2726 | 503-256-2726

September 8, 2011

Mr. Tom Hughes
Metro Council President
600 NE Grand Avenue
Portland, OR 97232

Dear President Hughes:

L-003-001

In recent weeks, the Columbia River Crossing has been working with Metro staff to address questions regarding mitigation identified in the Final Environmental Impact Statement (FEIS) document and commitments for work activities going forward. Attached is a document that summarizes some of the questions that have been raised, and how we have worked to resolve some of those questions with Metro staff. We are pleased with the coordinated progress we have made.

In the attachment, there are references to "we" and "the project" that are intended to refer to the Columbia River Crossing project, a joint project of the Oregon Department of Transportation and Washington State Department of Transportation. The project team is committed to the actions described in the attachment, and in the FEIS document that is soon to be published by our federal partners.

At your suggestion we have made the following modifications or amendments to the written materials included in the Metro Council's September 6, 2011, Work Session Packet.

- Page 4 – Multi-year construction contracts will include a stipulation requiring that construction equipment and methodology utilize the best available practices, through the life of the project as they become available, to minimize environmental impacts.
- Page 4 – Provided a more clear description of short term vs. long term mitigation for air quality.
- Page 6-7 – Community Enhancement Fund – Added the draft scope of work to this section; and deleted the first paragraph previously attached as part of the scope.

L-003-001

This letter, written by the Columbia River Crossing project, was submitted as public comment by several individuals. The project will continue to coordinate closely with Metro staff and Councilors on these and other issues.

L-003-001 Thank you for the opportunity to discuss the CRC project with you in the Metro Council Work Session. The open and collaborative discussion will help lead to a better project that will benefit the entire region. We sincerely appreciate your efforts to ensure this project moves forward in a way that is considerate and inclusive of Metro, and the interests of the community. We look forward to our work with you as the project proceeds toward construction. As always, we thank you for your support.

Sincerely,

Nancy Boyd
Director

Kris Strickler
Deputy Director

Cc: Metro Councilors

Enclosure

FEIS and post EIS Metro Questions and CRC Responses resulting from August 11, 2011 Metro Council Meeting And September 6, 2011 Metro Council Work Session

Hayden Island Long and Short Term Mitigation in FEIS

L-003-001

The FEIS includes various mitigation measures or offsets that are specific to Hayden Island for long term and short term impacts from the project. Short-term mitigation measures are for impacts identified during construction, while long term mitigation measures constitute post construction commitments or concepts. Below is a list of the mitigation measures and where they can be found in the July 2011 version of the Draft FEIS.

1. Long Term Mitigation (or offsets) for Hayden Island:

   a. Displacements (page 3-91):

      - (All) Purchase property for fair market value as determined through an appraisal and in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended..

   b. Visual (page 3-250):

      - Planting vegetation, street trees, and landscaping for screening or visual quality,
      - Shielding station and facility lighting from nearby residences and the night sky,
      - Minimizing structural bulk, such as for ramps and columns,
      - Designing architectural features to blend with the surrounding community context,
      - Use of public art for transit,
      - Utilization of the UDAG Design Guidelines

   c. Safety (pages 3-64 and 3-250):

      - Transit station will be designed with Crime Prevention Through Environmental Design and will be monitored with police, private security patrols, and security cameras.

L-003-001

2. Short Term (Construction Period) Mitigation for Hayden Island:

a. Air quality (pages 3-262 – 3-263):

- Controlling dust and exhaust emissions from demolition and construction activities,
- Contractors are required to comply with ODOT standard specifications (Section 290) for dust, diesel vehicles, and burning activities described above,
- Follow ODOT's specifications for truck staging areas for diesel-powered vehicles,
- Diesel construction vehicles and equipment will use ultra low sulfur diesel or will otherwise comply with any new, more stringent regulations in place at the time of construction,
- The project will continue to pursue emerging technologies for cleaner construction emissions, like the use of diesel scrubbers for compatible equipment, and continue to encourage and require those types of technologies as bidding laws allow.
- Stationary sources, such as concrete mix and asphalt plants, are generally required to obtain an Air Contaminant Discharge Permit from either DEQ or SWCAA and to comply with regulations for controlling dust and other pollutant emissions.
- Construction materials and activities would be managed to minimize dust, glare and smoke.

b. Noise and vibration (pages 3-295- 3-296):

- Comply with ODOT standard specifications relating to noise, including:
  - Limitation of hours and days on which construction is performed,
  - Equipment using sound-control devices,
  - Equipment comply with EPA noise standards,
  - Establishment of a complaint hotline,
  - Use broadband back-up alarms, or restrict the use of back-up beepers during evening and nighttime hours, and use spotters,
  - Contractor will perform vibration monitoring of all activities that might produce vibration levels,
  - Strategic placement of material stockpiles,
  - If specific noise complaints are received, contractor may be required to:
    - Locate stationary construction equipment as far from nearby noise-sensitive properties as feasible.
    - Shut off idling equipment.
    - Reschedule construction operations to avoid periods of noise annoyance identified in the complaint.
    - Notify nearby residents whenever extremely noisy work will be occurring.

L-003-001

- Install temporary or portable acoustic barriers around stationary construction noise sources.
- Operate electrically powered equipment using line voltage power rather than generators.

c. Commercial impacts (pages 3-65 and 3-115 – 3-116):

- Scheduling construction activities to minimize conflicts during peak travel ,
- Contractor required to obtain approval of traffic control plans,
- Maintain a program of coordination with and outreach to affected business and community interests to oversee the development and implementation of a transportation management plan,
- Establish a telephone complaint and information system to be staffed around the clock by personnel with authority to require the contractor to initiate immediate corrective action,
- Limit or concentrate work areas to minimize disruptions,
- Identify, provide and/or advertise temporary parking locations,
- Relocate affected loading zones, property accesses, bus stops, and other specially designated parking and access points before construction.
- Keeping businesses open and accessible
- Signs to identify the location of access points to businesses
- Business planning assistance
- Contractors coordinate schedule, pace and order of construction to minimize impact to nearby businesses
- Where possible, provide for local contracting opportunities

d. Traffic and transportation (pages 3-157 – 3-158):

- Maintain the existing bus service that regularly connects Hayden Island with nearby grocery and other retail services. This may include additional routing on the island to provide greater transit access during construction.
- Maintain paratransit and a shuttle service for qualifying, mobility impaired Hayden Island residents
- Provide effective detours that minimize out-of-direction travel and delays for travelers, and minimize cut-through traffic.

CRC Responses to specific FEIS issues

L-003-001

1. Replacement of Safeway grocery store

The displacement of Safeway is documented in the FEIS. Mitigation for this impact is governed by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. The project will suggest that Safeway relocate on Hayden Island, but cannot require them to relocate in any specific location. The eventual relocation will be a business decision by Safeway.

We have been informed that there will be a Target grocery store and pharmacy as part of the redevelopment plan for the Jantzen Beach Super Center. We understand that officials representing the Super Center initiated a site plan review with the City of Portland for a relocation and expansion of the Target store. Plans submitted to the City of Portland's Bureau of Development Review indicate that the store could include a grocery and a pharmacy. The plans show, for the Super Center as a whole, a space for a pharmacy, and at least one space for a grocer. We will continue to track this as redevelopment occurs.

2. Mitigating construction impacts such as dust, air pollution, vibration and air quality monitoring on Hayden Island

a. See Hayden Island Short and Long Term mitigation section above.
b. Multi-year construction contracts will include a stipulation requiring that construction equipment and methodology utilize the best available practices, through the life of the project as they become available, to minimize environmental impacts.
c. Air quality monitoring:

We understand there is a desire for air quality monitoring on Hayden Island during construction and long term. With the LPA, air quality is predicted to be better than in the no-build condition due to project improvements and fleet changes, therefore the project is not providing additional long term mitigation for air quality impacts beyond the elements of the project itself that will produce a reduction of vehicle emissions through the use of alternative modes and less congestion and bridge lift related idling (short term mitigation is discussed previously). In addition, air quality monitoring is not considered a form of mitigation, because the toxin source cannot be identified accurately. For some types of air toxics, such as diesel particulates, no direct measurement methods exist.

Finally, monitoring of Mobile Source Air Toxics (MSAT's) within a project corridor would yield data results that would be inconclusive in terms of health risk since short term and long term exposure limits or concentration levels have not yet been identified by the EPA. Issues that affect the accuracy of the health risks were also discussed in the air quality report for the CRC.

3. Early construction of the local bridge as a mitigation measure during the construction period

L-003-001

The possibility of early construction of the local multimodal bridge will continue to be a consideration by the project as project sequencing is refined. It is also discussed in Chapter 2 of the Draft FEIS, (Section 2.3.1), but not as mitigation. Although it is not appropriate to describe the early construction as mitigation, it is discussed as something we will explore as we further refine construction staging. Specifically it reads:

Similarly, the Marine Drive interchange construction would need to be coordinated with construction of the southbound lanes coming from Vancouver. While this interchange can be constructed independently from the work described above, the completion and utilization of the ramp system between Hayden Island and Marine Drive requires the work to occur in the same period. Early construction of the local multimodal bridge between Marine Drive and Hayden Island, so that it can be used as an alternate access route during the remaining construction period, will be analyzed during final design. The interchange reconstruction also needs to occur so that Marine Drive can be elevated, allowing the light rail extension to cross under Marine Drive. The Marine Drive interchange is expected to take a little more than 3 years to construct, including work at the Victory Boulevard interchange.

4. Review of the Finance Chapter of the FEIS (incorporate recommendations from the OST)

The project has incorporated the treasurer's recommendations to reduce financial risk and provide a more conservative finance plan. The updated financial chapter in the FEIS includes a recalibrated tolling financial projection to reflect the stalled economic growth and a level debt service. The treasurer's office is currently reviewing the FEIS financial chapters for consistency with his recommendations. The CRC will submit a finance chapter that reflects the treasurer's recommendations and the Federal Transit Administration and Federal Highway Administration will provide final approval of the finance chapter for FEIS publication.

5. Inclusion of the Bike/Ped Safety and Security Plan in the FEIS

We have included new language in 2.2.3 Pedestrian and Bicycle Improvements. We also refer the reader to the Memo from the Pedestrian and Bicycle Advisory Committee to the project and letter from the project accepting these recommendations. The new language reads:

Safety and Security

A maintenance and security program for the multi-use pathway would be established. It could include some or all of the following, as well as additional, elements:

- Identification of reliable funding sources and responsible parties for maintenance and security
- Commitment of reliable funding sources and responsible parties for maintenance and security
- Demand responsive and prompt facility management and maintenance
- Opportunities to "program the space" and support activity (e.g., kiosks, overlooks, vendor opportunities) to provide "eyes on the pathway"
- Ensure 24 hours a day, seven days a week pedestrian and bicycle access to and across the bridge and its connecting pathways

L-003-001

- Visible and regular on-site monitoring by law enforcement officers or security staff
- Security cameras monitored by law enforcement officers or security staff
- Call boxes to enable bridge users to report immediate maintenance needs and security concerns
- Efficient, sufficient, vandal-proof, no glare and dark skies compliant clear, crisp, white LED lighting
- Clearly posted laws and ordinances
- Advance notification and posting of maintenance closures and detours
- Citizen and volunteer participation shall be encouraged for future maintenance, operations and programming

CRC Responses to Post EIS Issues

1. Disposition of the former Thunderbird Hotel site after use as a construction staging area as a park

   The process for the final decisions regarding the disposition of any surplus property is made following the completion of construction. The potential uses of this specific site as a park and its potential to be declared surplus property will be discussed and coordinated with residents, local property owners and project partners.

2. Establish an approach to considering a park and ride lot on Hayden Island

   Further discussion regarding a park and ride on Hayden Island will occur as the project design is further developed after the Record of Decision. Compared to current transit access, the LPA represents a 25% driving distance reduction for a typical Hayden Island resident to access a park and ride facility and without having to use the freeway system. Please note the City of Portland's Hayden Island Plan designates the MAX station area as a mixed use district. Generally, TriMet and the City of Portland policies do not support siting park & rides in existing or planned mixed-use districts.

3. Commit to development of a community enhancement fund proposal

   In the last three years the CRC project team, the Project Sponsors Council, and CRC advisory groups have focused on incorporating a wide range of community enhancements into the project. The project has looked for ways to leverage the highway and transit investments into additional improvements for project neighbors and local communities. These improvements are beyond the benefits identified as the project's purpose and need. These tangible improvements include: improved local street connections in downtown Vancouver; new local roads and improved local flow and connections for Hayden Island residents; better bike and pedestrian access to the improved facilities; new bike and pedestrian trails; and a separate bridge for local auto access from North Portland to Hayden Island.

   We know there is more to be done. The CRC remains committed to aggressively maximizing and leveraging resources to bring additional benefits and improvements to our community. Two options have been identified for further exploration, both include a financial set aside of a

L-003-001

specific amount dedicated to a specific purpose. One approach is a project specific community enhancement fund. There is some history with such an approach - the Delta Park I-5 widening project (2006) and Metro's solid waste program (1991) are two examples. The other approach is a different concept, a regional fund established by the state to benefit the neighborhoods and communities in close proximity to I-5 and the CRC project. Both approaches have been successfully implemented in the Portland region and will help inform this effort.

We need to be clear about both of these approaches – neither will be easy. Both approaches have limitations and legal restrictions associated with anticipated funding sources. Both will require legislative support. Both will likely need enabling legislation and both will require funding. To be successful will require a clear purpose with obvious benefits and very broad support.

We appreciate the attention and focus that the Metro Council has maintained on this issue. The CRC is committed to working with Metro and project partners to: develop a clear need or problem statement; review and advance a program that addresses the needs statement with funding sources or opportunities identified; and, submit the program concept(s) to the Oregon legislatures in 2012 or 2013. The work scope to carry this out is defined below:

Community Enhancement Fund Scope of Work/Work Plan

- Development of Purpose and Goals of the Community Enhancement Fund.
- Definition of a policy basis for establishing the fund.
- Investigation of existing programs, including implementing agencies, legal structure, decision-making structure and criteria, project eligibility, accountability and summary of actual projects implemented.
- Definition and evaluation of alternative organizational and governance structures for administration of the fund and minimum requirements for representation on enhancement fund project selection committees. Consideration of alternative approaches for administration, including in-house, through an existing foundation (such as Oregon Community Foundation or Meyer Memorial Trust) or creation of a special purpose non-profit organization.
- Definition of community enhancement fund project eligibility and required vs. optional selection criteria.
- Investigation of legal restrictions of various potential funding sources under federal, state, regional and local authority and funding limitations. Identification of potential legislation required for implementation.
- Definition of mechanisms to ensure accountability of expenditure of public funds.

4. Establish how phasing will be defined and Metro will be involved

The CRC has always anticipated that construction of the entire project would require several years and would be phased to provide the most efficient implementation while minimizing impacts on the community and corridor users. Project engineers began months ago reviewing

L-003-001

engineering realities associated with keeping the facility open for users and bringing key elements such as light rail transit on line as expeditiously as possible.

While the engineering work on phasing was in progress, the project team also began an update of the financial analysis for the FEIS. That work dovetailed with the governor's request to the state treasurer to undertake an independent review of the CRC's "financial options, an assessment of strengths and weaknesses, as well as project phasing schedules with contingency plans if some of the funding does not materialize."

The state treasurer's review provides more clarity as well as updated information on the finances available for project implementation and the flow of those resources. In addition to the treasurer's work, the governor went further and signaled that he expects the CRC to start planning for a project that "adapts to available resources and fits into today's economic reality."

Capturing the work of the state treasurer and recognizing the changing economic realities, the CRC has begun an intensive work plan overlaying the engineering phasing with anticipated cash flow and funding realities. We have been asked to have this work ready for review and discussion by the interim legislative committees in both states. We anticipate that this work will have a full and complete public review and discussion, which will include Metro and other project partners.

The project is also incorporating the treasurer's recommendations to reduce financial risk and provide a more conservative finance plan. This more conservative approach will help inform the CRC's sequencing plans. The updated financial chapter in the FEIS will include a recalibrated tolling financial projection to reflect the stalled economic growth and a level debt service. Further financial scrutiny and certainty will result from an investment grade analysis that will occur prior to the initial sale of bonds.

5. Establish how governance of the project after completion will be determined and how Metro will be involved

In 2010, the Project Sponsors Council began discussing a set of complicated policy issues dealing with the management of this multi-modal facility. To facilitate a more in-depth review of some of these "governance" issues, a 14-member work group comprised of partner agencies, including Metro, was formed and chaired by Henry Hewitt and Steve Horenstein. The work group agenda includes developing options to implement a structure for on-going governance and project management in the periods before, during and after construction.

To help inform these discussions, WSDOT, ODOT, state DOJ/AG's, and the CRC are currently identifying key legal issues between the states and developing corresponding terms and conditions that will ultimately form the intergovernmental agreements. This scope of work includes:

- Reviewing existing bi-state agreements, decision matrix, and supporting documents;
- Reviewing state authority for Oregon and Washington;

L-003-001

- Developing proposals and options for governing structure for toll setting and administration, including how it would work with the Oregon and Washington Transportation Commissions;
- Developing proposals for debt allocations, including identification of needed legislation; and
- Identifying issues that may need resolution through new state or federal legislation.

The Oregon treasurer's July 20, 2011, report confirms the CRC focus with a finding that the CRC's governance plan must include a robust toll setting mechanism to assure that all toll-related debt service is paid in full each year through toll revenues.

The legal review and findings currently underway will serve as foundation for the governance work group as it develops options on possible governance models. This work must result in a governance model that will build confidence with the bond markets.

The probability that state legislation will be required in Washington and Oregon requires substantial progress on key governance issues in the next year. The CRC is working on a timeline and work plan for identifying and resolving the legal, policy and political issues on management of the facility. The specific schedule for which work when will be developed in response to the timelines associated with legislative action and bonding.

A report entitled "Columbia River Crossing, Cross-Jurisdictional Laws, Governance and Funding" has been distributed to Metro staff as further information on this topic as well. The report was originally prepared for the Washington State Legislature pursuant to ESSB 6381.

6. Establish how the finance plan will be refined and implemented over time and how Metro will be involved, including when there will be a decision on collection of tolls during construction

The financial plan for the CRC project is a combination of state, federal and local contributions. The general basis of that plan is not anticipated to fundamentally change but will be flexible in response to timing of available revenue. It is the project's intent to seek funding that does not jeopardize other regional priorities.

Specifically related to the federal dollars being contemplated, the project will pursue FHWA highway discretionary funding and FTA Section 5309 funds through the competitive New Starts process. The funding contribution being pursued is $400 million in highway funds, and $850 million through New Starts. Work on this portion of the plan will continue through the Preliminary Engineering, Final Design and the Full Funding Grant Agreement phases of the project. The project anticipates applying to enter into Final Design by early summer 2012, and hopes to begin receiving grant funds prior to construction starting in 2013.

The state funding participation is anticipated to be in the amount of $450 million each from Washington and Oregon. Initial requests will begin in the legislative sessions for 2012 and/or 2013, with state funds being allocated prior to construction in late 2013. The CRC looks

L-003-001

forward to continued partner agency support, including Metro, in the quest for state funds for this important project.

The local participation described above will be pursued as tolls on the new crossing. The authorization to toll will be a topic in the 2012 Washington legislative session, and toll bond sales are anticipated to begin upon completion of the toll investment grade analysis, currently planned for 2013. Toll bond covenants will require that toll revenues are first used for the following: debt service, reasonable return on private investment, and operation and maintenance, including reconstructing, resurfacing, restoring and rehabilitating work, among other things.

The recently released analysis by the Oregon Treasurer advanced the idea of pre-completion tolling to help achieve sufficient revenues. Further discussion of tolling during the construction phase will likely be raised during the engagement process with the legislatures, and pending governance discussions will need to be resolved to implement tolling.

7. Establish how aesthetic considerations will be incorporated into the design and how Metro will be involved

Governor Kitzhaber is working on a proposal to appoint a bi-state committee to review and select an architect and a bi-state bridge design advisory committee to work with the architect and public. The draft work plan is still in progress but is guided by the following:

"Moving forward the project requires highly qualified, exceptionally skilled, visionary design leadership that understands the importance of design in delivering a project that is worthy of the majestic setting and serves the needs of the citizens." UDAG

A joint governor appointed independent selection committee will review qualifications and recommend a qualified bridge architect to work with stakeholders, the urban design community, public, and project staff to develop conceptual designs, standards and/or criteria that will be the included in any bridge construction procurement documents. This firm or person could be retained throughout the design and construction of the bridge to develop, explain, and work with the design/builder to ensure that the final bridge design includes these standards and criteria.

The architect(s) would:

- Develop the aesthetic response to the crossing over the Columbia;
- Include the Harbor bridge(s) and the Hayden Island and SR 14 interchanges;
- Create increased certainty in the community about the conceptual design;
- Develop the design standards and/or criteria for inclusion in the bridge design-build RFP; and
- Provide consistency for the aesthetic design throughout the design-build process.

The architect will work with a group of stakeholders to develop conceptual designs, engage the public on design concepts, and approve the architectural standards and/or criteria for inclusion in design-build RFP and procurement documents. The members will represent diverse bridge

L-003-001

and bridge corridor stakeholders including, but not limited to: freight, marine, bike/ped, neighbors, commuters, transit and design community.

This work is in progress and is guided by providing adequate time to inform the design-build procurement schedule.

The Confederated Tribes of the Grand Ronde Community of Oregon

Tribal Attorney's Office
Phone (503) 879-2172
1-800 422-0232
Fax (503) 879-2333

9615 Grand Ronde Rd
Grand Ronde, OR 97347

October 21, 2011

Columbia River Crossing
c/o Heather Wills
700 Washington Street, Suite 300
Vancouver, WA 98660

via electronic submission to:
feedback@columbiarivercrossing.org

Re: Columbia River Crossing FEIS

Dear Sir or Madam:

T-001-001 The Columbia River Crossing ("CRC") project is in the homelands of the antecedent tribes and bands of the Confederated Tribes of the Grand Ronde Community of Oregon. Tribal villages were located on both sides of the Columbia, near the CRC project. The tribes ceded lands along the Columbia River to the United States by the Treaty with the Kalapuya, Etc., dated January 22, 1855 (10 Stats. 1143). Today, Grand Ronde tribal members live throughout the Portland basin, adjacent to or near the Columbia River. The ecology of the river is integral to the Tribe's culture, and the sense of stewardship retained by the Tribe for its homelands.

The CRC project FEIS proposes a compensatory mitigation site along Hood River, approximately one mile upstream of its confluence with the Columbia River. (Section 3.15) The Confederated Tribes oppose mitigation at the Hood River site, 60 miles from the CRC project. Mitigation should occur west of the Cascade Range to offset the local impacts of the CRC project. The Confederated Tribes strongly support restoration and mitigation at or near the confluence of the Columbia and Willamette Rivers. We believe restoration of shorelines and off-channel salmon habitat is viable along the Multnomah Channel and at the mouth of the Willamette River, areas near the project site.

Mitigating CRC project impacts in the distinct Hood River ecosystem precludes effective use of plant species culturally important to the Confederated Tribes, such as red osier dogwood, juncus, alder, salmonberry and sword fern. While these species may in some circumstances grow outside western Oregon and the Portland basin, their combination with east-side species would create habitat different from what would occur naturally in the area of the project site. Moreover, such distant habitat would be outside the homelands of the Confederated Tribes, remote to most Tribal members.

Umpqua Molalla Rogue River Kalapuya Chasta

T-001-001

As part of the Biological Assessment (BA) preparation and in anticipation of two state and one federal permit, the CRC project convened a working group (Conservation Measures Working Group) of permitting agencies that included NOAA Fisheries (NMFS), US Fish & Wildlife Service (USFWS), Oregon Department of Fish and Wildlife (ODFW) and WDFW to evaluate possible aquatic habitat restoration projects to offset adverse impacts. The working group developed goals, objectives and criteria that potential restoration projects within the Columbia Basin would have to meet to qualify as potential mitigation for ESA impacts from the CRC project, as described in the *CRC Guide to Project Sponsored Conservation*. Solicitations for information were sent to groups conducting, or involved with, aquatic habitat restoration projects throughout the Columbia Basin, including all tribes. This effort resulted in a list of over 100 potential aquatic habitat restoration projects that would provide habitat benefits to specific ESA-listed salmonid runs.

All project descriptions received from CRC's request for aquatic habitat restoration projects in the Columbia Basin were compared against the Guide. The Lewis River Confluence Restoration Project in Washington and the Hood River Side Channel Restoration at River Mile 1.0 in Oregon met all of the Guide's goals and project selection criteria and obtained concurrence with in concept from the Conservation Measures Working Group members, as well as from staff from the Oregon Department of State Lands, the US Army Corps of Engineers and Environmental Protection Agency. There was general agreement from the regulatory and natural resource agencies that these projects would provide significant benefit to native fishes and aquatic resources and more than adequately compensate for the adverse environmental effects from the CRC project. The reason why most projects fell out is because they did not meet all of the goals and/or success criteria of the Guide. For example, the goal "Conservation measures shall benefit species impacted by CRC project" meant that the mitigation must occur within

T-001-001 There is no compelling reason supporting mitigation at Hood River, east of the Cascade Range and distant from the project site.

Very truly yours,

Rob Greene
Tribal Attorney

cc: Tribal Council
Chris Leno
Mike Wilson
Michael Karnosh
Eirick Thorsgard

the lower Columbia River and benefit fish runs directly impacted by the project as a result of passing through the project area. Fish runs that enter into Multnomah Channel and go up the Willamette River do not pass through the CRC project area and thus are not impacted by project construction. Hydroacoustic impacts from project construction fall primarily upon the fish runs that pass through during impact pile driving (September 15-April 15). The lower Columbia ESU/DPS species that pass through the project area at that time are: lower Columbia chum, fall Chinook, coho and steelhead. The Columbia River Estuary Recovery Plan Module for Salmon and Steelhead (NOAA 2008) identifies the lack of rearing habitat in the lower Columbia estuary as one of the primary limiting factors to lower Columbia ESU/DPS species. The Lewis River Confluence Restoration project will provide rearing habitat for all four lower Columbia ESU/DPS species affected by project construction. The Hood River Side Channel Restoration at River Mile 1.0 will provide rearing habitat for all lower Columbia ESU/DPS species, except Columbia chum. We would be happy to meet with you and other Tribal representatives to further discuss comments regarding the CRC selection of off-site mitigation. We expect to continue to meet regularly with Grand Ronde technical staff as the project progresses toward construction and look forward to continued discussion and input on the project.

The Confederated Tribes of the Grand Ronde Community of Oregon

Tribal Attorney's Office
Phone (503) 879-2172
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9615 Grand Ronde Rd
Grand Ronde, OR 97347

October 21, 2011

Columbia River Crossing
c/o Heather Wills
700 Washington Street, Suite 300
Vancouver, WA 98660

via electronic submission to:
feedback@columbiarivercrossing.org

Re: Columbia River Crossing FEIS

Dear Sir or Madam:

T-001-001 The Columbia River Crossing ("CRC") project is in the homelands of the antecedent tribes and bands of the Confederated Tribes of the Grand Ronde Community of Oregon. Tribal villages were located on both sides of the Columbia, near the CRC project. The tribes ceded lands along the Columbia River to the United States by the Treaty with the Kalapuya, Etc., dated January 22, 1855 (10 Stats. 1143). Today, Grand Ronde tribal members live throughout the Portland basin, adjacent to or near the Columbia River. The ecology of the river is integral to the Tribe's culture, and the sense of stewardship retained by the Tribe for its homelands.

The CRC project FEIS proposes a compensatory mitigation site along Hood River, approximately one mile upstream of its confluence with the Columbia River. (Section 3.15) The Confederated Tribes oppose mitigation at the Hood River site, 60 miles from the CRC project. Mitigation should occur west of the Cascade Range to offset the local impacts of the CRC project. The Confederated Tribes strongly support restoration and mitigation at or near the confluence of the Columbia and Willamette Rivers. We believe restoration of shorelines and off-channel salmon habitat is viable along the Multnomah Channel and at the mouth of the Willamette River, areas near the project site.

Mitigating CRC project impacts in the distinct Hood River ecosystem precludes effective use of plant species culturally important to the Confederated Tribes, such as red osier dogwood, juncus, alder, salmonberry and sword fern. While these species may in some circumstances grow outside western Oregon and the Portland basin, their combination with east-side species would create habitat different from what would occur naturally in the area of the project site. Moreover, such distant habitat would be outside the homelands of the Confederated Tribes, remote to most Tribal members.

Umpqua Molalla Rogue River Kalapuya Chasta

T-001-001

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Build a Better Bridge Faster
White Paper
Provided to Governors Christine O. Gregoire and John A. Kitzhaber, M.D.
By the members of the
CRC Urban Design Advisory Group
March 11, 2011

G-001-001

With the report of the Independent Review Panel and the follow-up Bridge Review Panel Report (BRP), the local and state governments of Oregon and Washington, the CRC project, and the public are at a critical juncture in the development of the new I-5 bridge across the Columbia River. Work on the open-web box girder design (previously called the Locally Preferred Alternative--LPA) has been halted, and three reasonable alternatives have been recommended by 16 world class bridge designers on the Bridge Review Panel.

Although positioned by the departments of transportation and CRC staff as a false choice between a bridge that stays on schedule and a bridge that requires more planning, the decision facing the Governors is actually "what bridge will overall be the most easily funded, affordable, environmentally friendly and buildable? Of the three bridge designs presented by the Bridge Review Panel, the Tied-Arch design is the most expensive of the three and has little public support, so it will not be considered in this paper. The choice is between the cable-stayed bridge type and the composite deck-truss bridge type.

Based on all the analysis of criteria that follows, the best bridge option is also the one that offers the two states a landmark: The cable-stayed bridge.



To be clear, this decision does not require any more planning; the decision can and should be based on existing information that supports the specific criteria the Governors directed be used to evaluate the three bridge alternatives.

G-001-001

Since this letter was written, the Independent Review Panel and Bridge Expert Review Panel reports have been published and thoroughly reviewed and considered. Chapter 2 of the FEIS outlines what the CRC project has done with these recommendations and how they have affected the project. See below for responses to specific comments.

G-001-001

Subsequently, at the Portland City Club on Friday, March 4, Governor Kitzhaber amended the list, stating the current criteria as:

1. Affordability
2. Staying on schedule
3. Environmental commitments
4. Builds on resources to date
5. Least impact on the river
6. Encourages bids from multiple contractors
7. Aesthetics
8. Best path forward

1. Affordability

G-001-002

The Bridge Review Panel report showed that all three of their bridge types saved money over the original design. The cable-stayed saved $40 million. If the Truss is built in a straight alignment and unadorned it would save another $50 million. The DOTs recommendation seems to equate that the cheapest base cost possible is the only affordable option. A true comparison of the options shows little difference, making both bridge options affordable.

Comparative Cost

Cable-Stayed	$390,000,000
Deck-truss w/straight alignment	$340,000,000
Deck-truss w/ curved alignment, 12 piers + Add-ons	$375,000,000 (UDAG Est.)

The CRC staff has acknowledged that aesthetics will be added onto the deck-truss design at a later point. For purposes of more equitable comparison, let's suppose it will take at least $15 million to make the improvements and keep the DOTs' promise to spend extra on design.

If the Truss bridge type is shifted back to the original LPA curved alignment, as alluded to in the draft recommendation (*WDOT/ODOT KEY FINDINGS AND RECOMMENDATION RELATED TO BRIDGE TYPE, p. 7 "depending on the alignment" and p. 8, rendering showing 12 piers*), it will add an extra 10% length and 10% more piers in the water. This can be expected to increase the Truss option costs by 10%, an estimated additional $34 million, plus any extra engineering and construction costs for complexities from working on a curved bridge.

G-001-002

Further analysis of these bridge types clarified greater differences in costs than assumed by the Bridge Expert Review Panel and the notably higher risks with the cable-stayed and deck truss bridges.

G-001-002

The bottom line: **both alternates save money over the rejected LPA design; the likely final cost difference is very small, making both options affordable.**

2. Staying on schedule

G-001-003

First, the Columbia River Crossing is not on schedule now. Design has been stopped. The EIS continues to be delayed even without the change in bridge type. Public confidence in the CRC's technical staff and leadership is low given the failure of their LPA bridge design, increasing study costs, and delayed schedule. At the same time, it is critical to look at the elements that keep a project on schedule.

In a memo dated March 11, 2011, Bridge Review Panel chair Tom Warne, stated: "Most of the environmental work that has been done to date on this project is of use and value regardless of the bridge type selected.

"**Some additional environmental work would be required for both bridge types due to their different configurations.** Even though the composite deck truss has fewer piers in the water (10 versus 12) and would require a revisit of the Biological Assessment and the maybe the issuance of a new Biological Opinion. The cable-stayed bridge would require both of those actions as well. In either case this is not about starting over but rather augmenting or amending what has already been done.

"As of last summer there was substantial environmental work yet to be done based on the report of the IRP. **The IRP found that the project was not as close to a ROD as they said they were during the public testimony given during that review.** Note that their original date of January 2011 for the ROD has now slipped to later this year. This delay had nothing to do with the outcome of the BRP report but was **related to the substantial work that remained to be done as noted by the IRP.** Given where the project was on the environmental process last year the January 2011 date was unrealistic and the IRP pointed that out." *(Tom Warne email 1, March 11, 2011)*

Senator Murray said in a speech January 19, 2011, in Vancouver that successful project delivery on a timely basis requires:

- **Public consensus** sufficient to motivate our state legislators and congressional delegations
- A regional commitment to a **finance plan** including tolls and state funding of $450 million from both Washington and Oregon. (The December 2010 status report to FTA says less than 5% of the non-Section 5309 New Starts funds are committed to the project.)
- **Public support for Light Rail**, including long term operating cost commitments by local agencies.
- **Avoidance of delays from legal challenges** to the FEIS / ROD or to other project decisions.

G-001-003

Since UDAG prepared this letter, consensus has developed among the project partners and both governors around the composite deck truss bridge, which is now part of the locally preferred alternative. Through a NEPA re-evaluation, FTA and FHWA have considered the impacts of this bridge type and have concluded that it fits within the design and impact parameters evaluated in the DEIS. It does not require a supplemental DEIS. See Chapter 2 of the FEIS for a discussion of both of these topics. Through discussions with federal resource agencies it has also been determined that the composite deck truss bridge is covered by the existing Biological Opinion.

G-001-003

Public Consensus

The fastest and surest path to start the bridge project is the cable-stayed option. The deck-truss option has much less consensus, making it vulnerable to further legal delay and riskier for funding. To date, the following groups and organizations supporting a process to move the project forward quickly among those supporting the cable-stayed bridge type over a deck-truss bridge type: Hayden Island Manufactured Home Community, Hayden Island Livability Project, Hayden Island HiNooN, Bicycle Transportation Alliance, Architecture Foundation of Oregon, and the American Institute of Architects chapters in both Portland and Seattle.

Finance Plan and Light Rail Support

Key federal, state, and regional funding is dependent on strong public support. The cable-stayed option has much broader support, including elected leaders on both sides of the river, neighborhood associations, bike advocates, and more. Public support from Vancouver and Clark County is especially important since their public officials seem reluctant to fully support tolls and light rail costs. Members of the Vancouver City Council, in a meeting February 14, 2011, indicated encouraging interest in the cable-stayed option.

Legal Challenges and Delays

Key to meeting schedule requirements is making sure the permitting rules are being followed properly. Ignoring these rules to attempt to fast-track the deck-truss decision will likely cause delays due to legal challenges.

NEPA

As none of the three current bridge options on straight alignments have gone through the NEPA evaluation process, *any* option will likely need additional NEPA evaluation, so the cable-stayed option will not add delays that other options won't. A NEPA "evaluation must be done for *all* reasonable alternatives" before selecting any one option, according to NEPA requirements. *(A Citizens Guide to NEPA, p. 16)*

If the deck-truss option is chosen before this evaluation is done, the decision is highly vulnerable to legal challenges, severely delaying the start of the project. Furthermore, a Supplemental EIS is needed to document the environmental considerations in the choice of a preferred alternative given the three new options. *(A Citizens Guide to NEPA, p. 20)* Selecting an option because it is cheaper or re-uses more existing information does not satisfy NEPA. Environmental analysis, documentation, disclosure and public review is necessary for decisions involving significantly different major alternatives such as those identified by the BRP—regardless of the option that is ultimately chosen.

FAA delays for Pearson Field

G-001-004

Every bridge option impacts the Pearson Airfield to some degree, but all result in safety improvements over the existing I-5 lift bridge towers. However, air space safety requirements for PDX flights already prevent Pearson Field flight conflicts with the Interstate Bridge, making this a non-issue for all three bridge options. *(Columbia River Crossing Bridge Review Panel Final Report, pp. 81-82)*

The cable-stayed option is a safety improvement over existing Interstate towers currently allowed by FAA; the Interstate towers have never had an airplane/bridge accident. The BRP report says: "the cable-stayed tower and arch rib…will be substantial improvements to the operational safety of Pearson Field as compared to the existing bridge with its vertical lift towers." *(Bridge Review Panel Final Report, p. 82 & Figure 37)* and FAA "documentation…and coordination with the FAA…do not represent insurmountable barriers." *(Bridge Review Panel Final Report, p. 81)* These points were repeatedly reinforced by Tom Warne during his public presentations in Portland and Vancouver following release of the report.

At their March 8, 2011, meeting, the Vancouver Aviation Advisory Committee, which, in concert with the airport manager and the Federal Aviation Administration, participates in the assessment of proposed structures that might impact Pearson Field's airspace, reviewed the concepts for the three bridge designs and stated that, "if the designs remain as shown, which is within or lower than the dimensional envelope currently in place for the existing Interstate bridge, that any of the three structures will provide a better operating environment for departing and arriving aircraft than currently exists."

With strong regional consensus, the FAA/ Pearson Airfield issue is not a significant risk for the cable-stayed option and could be resolved in a couple of months of the locally preferred option's selection. The CRC draft flow chart shows an initial FAA Determination within 40 working days of submission of the evaluation form. If necessary, further FAA review may take up to 60 days for a decision that would be issued for public comment. *(FAA Hazard Determination process, as distributed at February 18, 2011, CRC Project Sponsors Council meeting)*

The concern that there would be more liability for public agencies if the cable-stayed bridge is built near Pearson Airfield seems unjustified. The airport and pilots who use the field have testified publically that any of the new bridges will improve safety compared to the existing bridge towers, and the existing towers do not appear to be an active liability issue for the agencies. *(Vancouver Aviation Advisory Committee letter to Vancouver City Council, March 8, 2011)*

3. Environmental/Community Commitments

G-001-005

As none the three new bridge alternatives have gone through the NEPA process, the choice of any alternative will likely need supplemental evaluation. As a result, at least some environmental decisions will need to be properly reconsidered. *(A Citizens Guide to NEPA, p. 16)*

G-001-004

The cable-stayed bridge may well be permittable, but it would have a greater impact on aviation safety and risk than the composite deck truss. It would be more costly and would not reduce overall environmental impacts.

G-001-005

See response above to comment G-001-003 regarding NEPA review and why no supplemental DEIS is required for the composite truss bridge.

G-001-006

Fortunately, the three BRP alternatives all have a smaller footprint and fewer piers in the water than the LPA used in the Biological Assessment. Earlier work can be used and applied to this new review speeding the environmental process needed for all bridge types.

In their recommendations the DOTs have neglected to respond to the BRP's supplemental recommendation about replacement of the existing I-5 North Portland Harbor, *(Bridge Review Panel Final Report, p. 14)* so commitments related to the Marine Drive and Hayden Island Interchanges need not change.

The DOTs have told elected officials that it is not possible to have a cable-stayed bridge and keep the Hayden Island Ramps configuration. This is not accurate. There are straightforward ways to hook up the road lanes from a cable-stayed bridge to the already agreed-to Hayden Island Ramps Design, known as Concept D. There would need to be some minor reworking of ramps because there are differences with the bike path and light rail alignments. These are easily solvable minor design details. The Island community has pledged to work diligently with the CRC engineers to facilitate fast integration of any design details that need to be worked out to integrate the cable-stayed bridge into the community.

In an email dated March 11, 2011, BRP Chair Tom Warne stated, "The CRC project engineers did all of the geometric work on the straight alignment on behalf of the BRP. It was a considerable effort and they produced the plan sheets found in the BRP report. That work refined the alignment and, **according to the CRC engineers who did this work, the connections at either end of the bridge were not a problem and that they met all of the AASHTO design standards in terms of curvature**, etc. The BRP was surprised by statements made by Don Wagner about all the problems with the straight alignment after our report was published since this was a point of significant discussion and review between the BRP and the CRC staff to make sure that a straighter alignment was possible and acceptable. Since it was the CRC engineers who came up with the new alignment it is puzzling why they are so critical of it today." *(Tom Warne email, March 11, 2011)*



Build a Better Bridge Faster White Paper Page 6
March 11, 2011

G-001-006

It is unknown whether the BO would have needed revisions with the cable-stayed or deck truss bridges as these bridge types were not selected. NMFS confirmed that revisions were not necessary to cover the selected bridge type - the composite deck truss.

For cost savings purposes, the project has elected to keep the North Portland Harbor bridges rather than replace them.

G-001-006



If the recommendation by the Bridge Review Panel to replace the Harbor Bridge *(Bridge Review Panel Final Report, p. 103)* was recognized, then there would need to be additional Island ramp reconfiguration. That would have likely impacted the Jantzen Super Center parking lot.

Without consideration of the Bridge Review Panel recommendation on the Harbor Bridge, Marine Drive and Hayden Island Interchanges, it is straightforward to hook up the cable-stayed bridge to the existing design of the ramps and absolutely keep the agreement with the Hayden Island Community and the Jantzen Beach Super Center.

Better for Bikes and Pedestrians

G-001-007

A commitment the CRC has made to the community is the bike facility will be World-Class. (*CRC Pedestrian and Bicycle Advisory Committee (PBAC) memorandum to Columbia River Crossing Task Force, June 17, 2008*) The bike community expects that commitment to be honored. The cable-stayed bridge type honors that commitment the best.


Cable-stayed bike pedestrian path


Deck-truss bike pedestrian path

The Truss bridge and the original open web design may at first glance seem like the same bike/ped experience. They are not. The open web cross-section allowed the bikes and pedestrian corridor to be

G-001-007

As discussed in the FEIS, a replacement bridge over the Columbia River will include dramatically improved bicycle and pedestrian facilities by providing:

- A new 16- to 20-foot multi-use pathway over the Columbia River completely separated from vehicle traffic due to the design of the Stacked Transit Highway Bridge;
- Protections from traffic noise, exhaust, and debris for pedestrians and bicyclists on the river crossing;
- More direct connections on each side of the river, consisting of stairs, ramps, and elevators, as well as pathway extensions that connect in with existing or planned facilities and public transit; and
- Many new or enhanced sidewalks, bike lanes, and crosswalks near the bridge and throughout the project area.

Since the publication of the DEIS in May 2008, and the selection of the LPA in July 2008, the CRC project team has continued to work with the Pedestrian and Bicycle Advisory Committee and project partners to refine route and facility design. The updated design, as described in Chapter 2 (Section 2.2) of the FEIS, is the outcome of a long collaboration process.

The Governors led a decision-making process regarding bridge type that resulted in the selection of the composite truss bridge type. The selection was understood to be driven largely by constructability and cost issues. The bike/pedestrian pathway remains largely unchanged in this design from that of the open web box. Designers will work to incorporate overlooks/belvederes into the truss design.

G-001-007

closer to the road edge and the natural light. The Open Web design had belvederes in the middle of the bridge to allow a way for people to get out from underneath the bridge and enjoy the view. The composite deck-truss will be in shadow most the day due to the 28 foot roadway overhang on both sides.

While the Truss bike cell would provide protection from the rain while crossing the river, the cover doesn't compensate for the feeling of danger that concerns a lot of existing bike riders and pedestrian users. The Bicycle Transportation Alliance withdrew support for the underneath bike cell proposed by the Open Web over security concerns. They also show no support for the Truss bridge type

The cable-stayed bridge does provide a world class bicycle and pedestrian experience.

The elevated pathway on the cable-stayed bridge will provide full 360-degree views all across the bridge. Though there will be noise from the traffic lanes on each side, the cable-stayed path will be safer for users because they will be visible from the road ways and not isolated below deck. It will serve the local bicycle and pedestrian needs as well as draw tourists. Rain exposure is really not a consideration, as it will exist on both sides of the river, anyway

The cable-stayed bridge is favored by the Bicycle Transportation Alliance and Cycle Oregon over the deck-truss bridge type *(Bicycle Transportation Alliance letter to Governor John Kitzhaber, February 23, 2011)*. **The cable-stayed bridge best keeps the commitment to the community for a world-class bike and pedestrian facility.**

Seismic Performance

G-001-008

While not addressed in the DOTs' recommendation, the Bridge Review Panel made it abundantly clear that the deck-truss bridge type has a higher seismic (predicted behavior) risk factor/risk ranking than the cable-stayed *(Bridge Review Panel Final Report, page 87)*, surely an essential consideration in this location.

4. Builds on resources to date

G-001-009

Since all of the environmental work that has been done to date applies to the bridge that has a larger footprint in the water than either the cable-stayed or the deck-truss both of these designs should be able to re-use the previous work in an equal manner.

In his email of March 11, 2011, Tom Warne confirmed: "… there has been over $100 million spent on this project to date. It would be a mistake to believe that this total is focused solely on the bridge structure itself. **Much of this amount has been spent on related environmental issues that must be addressed in order to prepare a complete and comprehensive Final EIS and not specifically on the bridge.**

He further stated: "Most of the $100 million will be useful regardless of the bridge type selected. Some additional expenditure will be required for any of the new bridge types being considered. This

G-001-008

While the Bridge Review Panel report does rank the cable-stayed bridge as a "1" and the composite deck truss as a "2", this is simply a comparative risk analysis, and seismic predicted behavior was just one of 15 factors ranked. It is not clear from the chart if the composite deck truss would actually be more vulnerable to seismic events than the cable-stayed bridge. The composite deck truss bridge would be built to current seismic standards.

G-001-009

Mr. Warne is correct that much of the environmental work done through 2010 continued to be applicable to the project even after the bridge type changed.

Also much of the concern regarding in-water work impacts on salmon is not just about the area of the footprint. The more important issue that affects impacts to salmon and other species is the duration and type of in-water work that would occur. Please see the response above to comment G-001-003 regarding NEPA compliance.

G-001-009

would have to be examined in greater detail and discussions held with resource agencies and their management to determine just what the impact would be. Absent those discussions (particularly at the executive level of these organizations) **it would be premature to predict how much additional time and money would be required for either bridge type**." *(Tom Warne email 1, March 11, 2011)*

5. Least impact on the river

G-001-010

With fewer pylons in the water (3 vs. 10-12) and with longer spans (830 ft vs. 500 ft) the cable–stayed bridge provides **safer commercial and private marine traffic** on the river compared to the deck-truss.

As can be seen in the following table, both the cable-stayed and the deck-truss have a smaller footprint than the original open web LPA design. The cable-stayed bridge has a significant advantage of fewer piers in the water.

In-Water Impacts	# of Piers	Footprint
Open-web LPA Design	12	58,500
Cable-Stayed	3	52,000
Deck-truss– Curved	12	52,800
Deck-truss–Straight	10	44,000

With footprint compacted into only three piers (vs. 10-12), the cable-stayed bridge most likely requires fewer temporary construction piles, reducing pile-driving noise and vibration impacts on fish and nearby neighborhoods.



Cable-stayed's three piers



Deck-truss' 12 piers

For comparison and background information, the CRC's previous LPA design with 12 piers required 2 near-shore cofferdams and 1224 temporary piles. Pile-driving would go on over 7 months per year for 6 years per the BiologicalOpinion. *(Endangered Species Act Section 7 Biological Opinion, January 29, 2011, p. 6)* Impact-driving would be limited to one hour per day, up to 142 days total so it would be a few days per month. Vibratory pile driving could go on any time during the year.

CRC staff has claimed that the cable-stayed bridge will require additional permanent pile supports in the sensitive shallow water near shore. However, the highly-qualified BRP, with much more cable-

G-001-010

Additional analysis of these bridge types identified more in-water work for the cable-stayed bridge than was assumed by the Bridge Expert Review Panel. The Panel also did not include any fish biologists or other environmental experts so the Panel's report assumptions regarding environmental impacts were not based on review or opinions by relevant experts.

The project partners developed consensus to move forward with the Selected Alternative in the ROD, which includes the composite deck truss bridge.

G-001-010

stayed bridge design and construction experience than the DOT staffs, has confirmed that in-water supports are NOT needed. Their report says, "Due to the low span-to-depth ratio...the end spans can be larger than would be expected with the standard cable-stayed bridges and the hold-down piers shifted apart from the last stays. The optimum ratio needs to be developed in the final design stages." *(Bridge Review Panel Final Report, p. 34)*

6. Encourages bids from multiple contractors

G-001-011

The Chair of the BRP, Tom Warne, indicated in his public presentation in Portland on February 17, 2011, that a cable-stayed bridge of this significance and size will easily attract several highly qualified bidders. Further, he indicated that any of the bridge types would not be likely to receive more than 3 or 4 bids because of the high cost of bid preparation. He noted that potential bidders will not spend the money if the number of competitors is too high. Note that TriMet only pre-qualified 3 bidders for the new cable-stayed Willamette River Transit Bridge, while the record shows 7 bidders responded to the Willamette River Transit Bridge RFQ. *(TriMet Resolution No. 10-12-65, authorizing construction contract for WRTB)*

7. Aesthetics

G-001-012

As mentioned in the BRP report, the "challenge facing the CRC team is to advance an option that offers aesthetic value, as determined by the communities, while still achieving the cost objectives of the project." It has been repeatedly noted in public forums that the public does not want another stripped down Glen Jackson-style bridge. From the onset of the Urban Design Advisory Group process, CRC leaders stated repeatedly their commitment was to building a better bridge than the I-205 crossing. As noted in the BRP Final Report *(p. 41)*, a cable-stayed bridge would be "perceived as a landmark by virtue of its basic form and scale." This is highly compatible with the stated objective of building a bridge that would be appropriate for crossing the Columbia River, a natural resource with deep meaning for regional history and identity.

A landmark bridge, best achieved by the above deck structure of cable-stayed option, will make future development of the Vancouver and Hayden Island waterfronts more desirable, as often cited by the local communities adjacent to the river in Oregon and Washington. This bridge type is a more context sensitive design, making historical reference to our vital maritime past while also reinforcing our regional livability and sustainability planning goals.

There are practical as well as aesthetic reasons for embracing this design. With the cable-stayed option, the towers are visible from a distance as you approach the crossing. This marks the river and places one in a broader context to one's surroundings. The towers offer a strong visual impact which naturally helps with wayfinding. With the above-deck orientation for bicycles and pedestrians, the cable-stayed bridge solution is safer and also presents a more desirable opportunity for public use and special events such as the Seattle to Portland Classic, one of the top ten recreational bike rides in the country, not to mention events like Bridge Pedal, Sunday Parkways, Cycle Oregon, Portland Marathon, etc. As the Bicycle Transportation Alliance has stated, world-class bike facilities would not include a below deck orientation.

G-001-011

This appears to be an accurate account of the presentation.

G-001-012

The bridge type selected by the two Governors will still provide opportunities for place-making and compelling aesthetics. The two Governors chose the composite truss design because it is a more appropriate bridge type for the engineering context, because it will not interfere with Pearson Airfield or Portland International Airport, and because it saves many millions of dollars.

As discussed in the FEIS, a replacement bridge over the Columbia River will include dramatically improved bicycle and pedestrian facilities by providing:

- A new 16- to 20-foot multi-use pathway over the Columbia River completely separated from vehicle traffic due to the design of the Stacked Transit Highway Bridge, and
- Protections from traffic noise, exhaust, and debris for pedestrians and bicyclists on the river crossing.

While there are some who would prefer the unobstructed views of an "above deck" bike facility, others prefer the under deck option which buffers riders from vehicular noise and spray, and protects riders from rain.

G-001-012

The architectural design of the bridge should stem from the engineered response to the inherent structural needs particular to the bridge type. Of the two options, the cable-stayed bridge offers the best opportunity to maximize structural efficiency and exploit the natural advantages of the various cable-stayed bridge elements, in other words, funders will 'get more design bang for the buck'. The long, thin horizontal bridge deck punctuated by three slender towers is an efficient and elegant design solution in contrast to the more massive piers of the Deck-Truss. The cable-stayed bridge will appear to float above the river, and with its more sculpted forms and delicate cables, create an ever-changing display of dappled light and shadow. This is a more holistic approach to design and doesn't rely on superfluous add-ons to try to "mitigate" or "improve" the design of the more ubiquitous deck-truss option.

As the expert Bridge Review Panel stated, "*"... it would be very difficult to develop a composite deck-truss or any other girder bridge to a form that could readily be perceived as having a similar signature appearance to the cable-stayed and arch alternatives. As a result, it is difficult to present any truss bridge as an architectural solution that would be appropriate for this special crossing of the Columbia River." (Bridge Review Panel Final Report, p. 69)*

Perhaps most important, as has already been observed, this design helps galvanize public support for the project. Selecting the right design now will bring the region together in a way that will finally make the bridge a reality.

8. Best path forward

G-001-013

The best path forward is to build the bridge that creates the largest buy-in for the project, with the least legal vulnerability, at an affordable cost.

The fastest and surest path to start the bridge project is the cable-stayed bridge type.

The deck-truss option has much less consensus, making it vulnerable to further legal delay and riskier for funding. The reluctant support (due to the fears of delay) for the Truss design is not the kind of support that will motivate the region or the congressional delegations.

Key federal funding is dependent on strong support, a message reinforced by the BRP chair and Senator Murray. The cable-stayed option has much broader support, including from elected leaders, neighborhood associations near the river, CRC Advisory groups, and bike advocates. This support is based on the excitement of a good design, and the ability of the cable-stayed option to meet all of the stated criteria in an overall better way.

The Truss bridge is likely to have little long-term public support. Without support from affected neighborhoods, costly and lengthy project delays will occur. While the Truss bridge is a simpler construction, it is visually indistinguishable from the former, flawed Open Web LPA design. Likewise, the apparent short-term benefit of lower cost is negated if efforts to maintain the current curved alignment are retained.

G-001-013

The project is currently planning to use the Design-Build process for bridge construction and potentially for construction of other elements.

The cable-stayed bridge was considered but not advanced, as discussed in Chapter 2 of the FEIS. This UDAG comment has outlined some reasons that it should have been selected. Each is addressed as follows:

- it would not speed the beginning of construction compared to the composite truss type;
- it's not clear that it has more support for funding;
- it provides no obvious advantage in terms of duration of construction;
- it would not have lower permitting and environment risks; and
- it would not be less expensive to construct than the composite truss.

G-001-013

The Bridge Review Panel experts were correct in stating that significant cost-savings to the project can be achieved overall without compromising the bridge structure itself. There is only one chance to build the structure over the river, while other project components can be phased or redesigned.

Use Design/Build Process

According to BRP chair, Tom Warne, the best path forward is for a change of approach to a Design/Build process for the bridge and adjacent interchanges on each shoreline. The cable-stayed construction period can easily fit the schedule through a Design/Build process, a construction process any of the three options can use. Further, a design/build process for the bridge would eliminate many of the design, procurement, and construction risk differences claimed between the deck-truss and cable-stayed options. This process has recently been or is currently being utilized for projects including the Tacoma Narrows Bridge, the Alaska Viaduct replacement and the new 620 Floating Bridge in Seattle.

Cable-stayed Bridge: Build a Better Bridge. Faster.

- It's faster to begin construction with broader support for funding.
- It's possible to build on time.
- It has fewer permitting and environmental risks.
- All options need FAA review but issues can be resolved with broad support.
- Is affordable.
- Cable-stayed is better for commerce and livability.
- Cable-stayed Bridge is the best path forward.

The Bridge Review Panel Final Report is correct in stating, "the new Columbia River crossing represents the most dramatic river structure in the northwest and may be one of the last major crossings ever to be built along the West Coast."

Citations throughout this white paper are from the following attached documents:

- Washington Department of Transportation and Oregon Department of Transportation KEY FINDINGS AND RECOMMENDATION RELATED TO BRIDGE TYPE, February 25, 2011 - http://www.columbiarivercrossing.org/FileLibrary/GeneralProjectDocs/DOTs_Draft%20Recommendation.pdf
- Columbia River Crossing Bridge Review Panel Final Report, February 3, 2011 - http://www.columbiarivercrossing.com/FileLibrary/GeneralProjectDocs/BRP_Report.pdf
- Council on environmental quality, executive office of the president: A Citizen's Guide to the NEPA - http://ceq.hss.doe.gov/nepa/Citizens_Guide_Dec07.pdf
- FAA Hazard Determination Process, from February 18, 2011, Project Sponsors Council Meeting - http://www.columbiarivercrossing.org/FileLibrary/MeetingMaterials/PSC/PSC_MM_021811/PSC_MM_021811_6_FAATimeline.pdf
- Vancouver Aviation Advisory Committee letter to Vancouver City Council, March 8, 2011
- CRC Pedestrian and Bicycle Advisory Committee (PBAC) memorandum to Columbia River Crossing Task Force, June 17, 2008 - http://www.columbiarivercrossing.org/FileLibrary/MeetingMaterials/PBAC%20DEIS%20LPA%20Memo%20061708.pdf
- TriMet memorandum Resolution No. 10-12-65, authorizing contract for Willamette River Transit Bridge - http://trimet.org/pdfs/meetings/board/dec-10/Res-10-12-65.pdf
- Bicycle Transportation Alliance letter to Governor John Kitzhaber, February 23, 2011
- UNITED STATES DEPARTMENT OF COMMERCE National Oceanic and Atmospheric Administration Endangered Species Act Section 7 Biological Opinion, dated January 19, 2011
- Tom Warne email 1, March 11, 2011
- Tom Warne email 2, March 11, 2011

Build a Better Bridge Faster
White Paper
Provided to Governors Christine O. Gregoire and John A. Kitzhaber, M.D.
By the members of the
CRC Urban Design Advisory Group
March 11, 2011

G-001-001

With the report of the Independent Review Panel and the follow-up Bridge Review Panel Report (BRP), the local and state governments of Oregon and Washington, the CRC project, and the public are at a critical juncture in the development of the new I-5 bridge across the Columbia River. Work on the open-web box girder design (previously called the Locally Preferred Alternative--LPA) has been halted, and three reasonable alternatives have been recommended by 16 world class bridge designers on the Bridge Review Panel.

Although positioned by the departments of transportation and CRC staff as a false choice between a bridge that stays on schedule and a bridge that requires more planning, the decision facing the Governors is actually "what bridge will overall be the most easily funded, affordable, environmentally friendly and buildable? Of the three bridge designs presented by the Bridge Review Panel, the Tied-Arch design is the most expensive of the three and has little public support, so it will not be considered in this paper. The choice is between the cable-stayed bridge type and the composite deck-truss bridge type.

Based on all the analysis of criteria that follows, the best bridge option is also the one that offers the two states a landmark: The cable-stayed bridge.



To be clear, this decision does not require any more planning; the decision can and should be based on existing information that supports the specific criteria the Governors directed be used to evaluate the three bridge alternatives.

G-001-001

Since this letter was written, the Independent Review Panel and Bridge Expert Review Panel reports have been published and thoroughly reviewed and considered. Chapter 2 of the FEIS outlines what the CRC project has done with these recommendations and how they have affected the project. See below for responses to specific comments.

G-001-001

Subsequently, at the Portland City Club on Friday, March 4, Governor Kitzhaber amended the list, stating the current criteria as:

1. Affordability
2. Staying on schedule
3. Environmental commitments
4. Builds on resources to date
5. Least impact on the river
6. Encourages bids from multiple contractors
7. Aesthetics
8. Best path forward

1. Affordability

G-001-002

The Bridge Review Panel report showed that all three of their bridge types saved money over the original design. The cable-stayed saved $40 million. If the Truss is built in a straight alignment and unadorned it would save another $50 million. The DOTs recommendation seems to equate that the cheapest base cost possible is the only affordable option. A true comparison of the options shows little difference, making both bridge options affordable.

Comparative Cost

Cable-Stayed	$390,000,000
Deck-truss w/straight alignment	$340,000,000
Deck-truss w/ curved alignment, 12 piers + Add-ons	$375,000,000 (UDAG Est.)

The CRC staff has acknowledged that aesthetics will be added onto the deck-truss design at a later point. For purposes of more equitable comparison, let's suppose it will take at least $15 million to make the improvements and keep the DOTs' promise to spend extra on design.

If the Truss bridge type is shifted back to the original LPA curved alignment, as alluded to in the draft recommendation (*WDOT/ODOT KEY FINDINGS AND RECOMMENDATION RELATED TO BRIDGE TYPE, p. 7 "depending on the alignment" and p. 8, rendering showing 12 piers*), it will add an extra 10% length and 10% more piers in the water. This can be expected to increase the Truss option costs by 10%, an estimated additional $34 million, plus any extra engineering and construction costs for complexities from working on a curved bridge.

G-001-002

Further analysis of these bridge types clarified greater differences in costs than assumed by the Bridge Expert Review Panel and the notably higher risks with the cable-stayed and deck truss bridges.

G-001-002

The bottom line: **both alternates save money over the rejected LPA design; the likely final cost difference is very small, making both options affordable.**

2. Staying on schedule

G-001-003

First, the Columbia River Crossing is not on schedule now. Design has been stopped. The EIS continues to be delayed even without the change in bridge type. Public confidence in the CRC's technical staff and leadership is low given the failure of their LPA bridge design, increasing study costs, and delayed schedule. At the same time, it is critical to look at the elements that keep a project on schedule.

In a memo dated March 11, 2011, Bridge Review Panel chair Tom Warne, stated: "Most of the environmental work that has been done to date on this project is of use and value regardless of the bridge type selected.

"**Some additional environmental work would be required for both bridge types due to their different configurations.** Even though the composite deck truss has fewer piers in the water (10 versus 12) and would require a revisit of the Biological Assessment and the maybe the issuance of a new Biological Opinion. The cable-stayed bridge would require both of those actions as well. In either case this is not about starting over but rather augmenting or amending what has already been done.

"As of last summer there was substantial environmental work yet to be done based on the report of the IRP. **The IRP found that the project was not as close to a ROD as they said they were during the public testimony given during that review.** Note that their original date of January 2011 for the ROD has now slipped to later this year. This delay had nothing to do with the outcome of the BRP report but was **related to the substantial work that remained to be done as noted by the IRP.** Given where the project was on the environmental process last year the January 2011 date was unrealistic and the IRP pointed that out." *(Tom Warne email 1, March 11, 2011)*

Senator Murray said in a speech January 19, 2011, in Vancouver that successful project delivery on a timely basis requires:

- **Public consensus** sufficient to motivate our state legislators and congressional delegations
- A regional commitment to a **finance plan** including tolls and state funding of $450 million from both Washington and Oregon. (The December 2010 status report to FTA says less than 5% of the non-Section 5309 New Starts funds are committed to the project.)
- **Public support for Light Rail**, including long term operating cost commitments by local agencies.
- **Avoidance of delays from legal challenges** to the FEIS / ROD or to other project decisions.

G-001-003

Since UDAG prepared this letter, consensus has developed among the project partners and both governors around the composite deck truss bridge, which is now part of the locally preferred alternative. Through a NEPA re-evaluation, FTA and FHWA have considered the impacts of this bridge type and have concluded that it fits within the design and impact parameters evaluated in the DEIS. It does not require a supplemental DEIS. See Chapter 2 of the FEIS for a discussion of both of these topics. Through discussions with federal resource agencies it has also been determined that the composite deck truss bridge is covered by the existing Biological Opinion.

G-001-003

Public Consensus

The fastest and surest path to start the bridge project is the cable-stayed option. The deck-truss option has much less consensus, making it vulnerable to further legal delay and riskier for funding. To date, the following groups and organizations supporting a process to move the project forward quickly among those supporting the cable-stayed bridge type over a deck-truss bridge type: Hayden Island Manufactured Home Community, Hayden Island Livability Project, Hayden Island HiNooN, Bicycle Transportation Alliance, Architecture Foundation of Oregon, and the American Institute of Architects chapters in both Portland and Seattle.

Finance Plan and Light Rail Support

Key federal, state, and regional funding is dependent on strong public support. The cable-stayed option has much broader support, including elected leaders on both sides of the river, neighborhood associations, bike advocates, and more. Public support from Vancouver and Clark County is especially important since their public officials seem reluctant to fully support tolls and light rail costs. Members of the Vancouver City Council, in a meeting February 14, 2011, indicated encouraging interest in the cable-stayed option.

Legal Challenges and Delays

Key to meeting schedule requirements is making sure the permitting rules are being followed properly. Ignoring these rules to attempt to fast-track the deck-truss decision will likely cause delays due to legal challenges.

NEPA

As none of the three current bridge options on straight alignments have gone through the NEPA evaluation process, *any* option will likely need additional NEPA evaluation, so the cable-stayed option will not add delays that other options won't. A NEPA "evaluation must be done for *all* reasonable alternatives" before selecting any one option, according to NEPA requirements. *(A Citizens Guide to NEPA, p. 16)*

If the deck-truss option is chosen before this evaluation is done, the decision is highly vulnerable to legal challenges, severely delaying the start of the project. Furthermore, a Supplemental EIS is needed to document the environmental considerations in the choice of a preferred alternative given the three new options. *(A Citizens Guide to NEPA, p. 20)* Selecting an option because it is cheaper or re-uses more existing information does not satisfy NEPA. Environmental analysis, documentation, disclosure and public review is necessary for decisions involving significantly different major alternatives such as those identified by the BRP—regardless of the option that is ultimately chosen.

FAA delays for Pearson Field

G-001-004

Every bridge option impacts the Pearson Airfield to some degree, but all result in safety improvements over the existing I-5 lift bridge towers. However, air space safety requirements for PDX flights already prevent Pearson Field flight conflicts with the Interstate Bridge, making this a non-issue for all three bridge options. *(Columbia River Crossing Bridge Review Panel Final Report, pp. 81-82)*

The cable-stayed option is a safety improvement over existing Interstate towers currently allowed by FAA; the Interstate towers have never had an airplane/bridge accident. The BRP report says: "the cable-stayed tower and arch rib…will be substantial improvements to the operational safety of Pearson Field as compared to the existing bridge with its vertical lift towers." *(Bridge Review Panel Final Report, p. 82 & Figure 37)* and FAA "documentation…and coordination with the FAA…do not represent insurmountable barriers." *(Bridge Review Panel Final Report, p. 81)* These points were repeatedly reinforced by Tom Warne during his public presentations in Portland and Vancouver following release of the report.

At their March 8, 2011, meeting, the Vancouver Aviation Advisory Committee, which, in concert with the airport manager and the Federal Aviation Administration, participates in the assessment of proposed structures that might impact Pearson Field's airspace, reviewed the concepts for the three bridge designs and stated that, "if the designs remain as shown, which is within or lower than the dimensional envelope currently in place for the existing Interstate bridge, that any of the three structures will provide a better operating environment for departing and arriving aircraft than currently exists."

With strong regional consensus, the FAA/ Pearson Airfield issue is not a significant risk for the cable-stayed option and could be resolved in a couple of months of the locally preferred option's selection. The CRC draft flow chart shows an initial FAA Determination within 40 working days of submission of the evaluation form. If necessary, further FAA review may take up to 60 days for a decision that would be issued for public comment. *(FAA Hazard Determination process, as distributed at February 18, 2011, CRC Project Sponsors Council meeting)*

The concern that there would be more liability for public agencies if the cable-stayed bridge is built near Pearson Airfield seems unjustified. The airport and pilots who use the field have testified publically that any of the new bridges will improve safety compared to the existing bridge towers, and the existing towers do not appear to be an active liability issue for the agencies. *(Vancouver Aviation Advisory Committee letter to Vancouver City Council, March 8, 2011)*

3. Environmental/Community Commitments

G-001-005

As none the three new bridge alternatives have gone through the NEPA process, the choice of any alternative will likely need supplemental evaluation. As a result, at least some environmental decisions will need to be properly reconsidered. *(A Citizens Guide to NEPA, p. 16)*

G-001-004

The cable-stayed bridge may well be permittable, but it would have a greater impact on aviation safety and risk than the composite deck truss. It would be more costly and would not reduce overall environmental impacts.

G-001-005

See response above to comment G-001-003 regarding NEPA review and why no supplemental DEIS is required for the composite truss bridge.

G-001-006

Fortunately, the three BRP alternatives all have a smaller footprint and fewer piers in the water than the LPA used in the Biological Assessment. Earlier work can be used and applied to this new review speeding the environmental process needed for all bridge types.

In their recommendations the DOTs have neglected to respond to the BRP's supplemental recommendation about replacement of the existing I-5 North Portland Harbor, *(Bridge Review Panel Final Report, p. 14)* so commitments related to the Marine Drive and Hayden Island Interchanges need not change.

The DOTs have told elected officials that it is not possible to have a cable-stayed bridge and keep the Hayden Island Ramps configuration. This is not accurate. There are straightforward ways to hook up the road lanes from a cable-stayed bridge to the already agreed-to Hayden Island Ramps Design, known as Concept D. There would need to be some minor reworking of ramps because there are differences with the bike path and light rail alignments. These are easily solvable minor design details. The Island community has pledged to work diligently with the CRC engineers to facilitate fast integration of any design details that need to be worked out to integrate the cable-stayed bridge into the community.

In an email dated March 11, 2011, BRP Chair Tom Warne stated, "The CRC project engineers did all of the geometric work on the straight alignment on behalf of the BRP. It was a considerable effort and they produced the plan sheets found in the BRP report. That work refined the alignment and, **according to the CRC engineers who did this work, the connections at either end of the bridge were not a problem and that they met all of the AASHTO design standards in terms of curvature**, etc. The BRP was surprised by statements made by Don Wagner about all the problems with the straight alignment after our report was published since this was a point of significant discussion and review between the BRP and the CRC staff to make sure that a straighter alignment was possible and acceptable. Since it was the CRC engineers who came up with the new alignment it is puzzling why they are so critical of it today." *(Tom Warne email, March 11, 2011)*



G-001-006

It is unknown whether the BO would have needed revisions with the cable-stayed or deck truss bridges as these bridge types were not selected. NMFS confirmed that revisions were not necessary to cover the selected bridge type - the composite deck truss.

For cost savings purposes, the project has elected to keep the North Portland Harbor bridges rather than replace them.

G-001-006



If the recommendation by the Bridge Review Panel to replace the Harbor Bridge *(Bridge Review Panel Final Report, p. 103)* was recognized, then there would need to be additional Island ramp reconfiguration. That would have likely impacted the Jantzen Super Center parking lot.

Without consideration of the Bridge Review Panel recommendation on the Harbor Bridge, Marine Drive and Hayden Island Interchanges, it is straightforward to hook up the cable-stayed bridge to the existing design of the ramps and absolutely keep the agreement with the Hayden Island Community and the Jantzen Beach Super Center.

Better for Bikes and Pedestrians

G-001-007

A commitment the CRC has made to the community is the bike facility will be World-Class. (*CRC Pedestrian and Bicycle Advisory Committee (PBAC) memorandum to Columbia River Crossing Task Force, June 17, 2008*) The bike community expects that commitment to be honored. The cable-stayed bridge type honors that commitment the best.


Cable-stayed bike pedestrian path


Deck-truss bike pedestrian path

The Truss bridge and the original open web design may at first glance seem like the same bike/ped experience. They are not. The open web cross-section allowed the bikes and pedestrian corridor to be

G-001-007

As discussed in the FEIS, a replacement bridge over the Columbia River will include dramatically improved bicycle and pedestrian facilities by providing:

- A new 16- to 20-foot multi-use pathway over the Columbia River completely separated from vehicle traffic due to the design of the Stacked Transit Highway Bridge;
- Protections from traffic noise, exhaust, and debris for pedestrians and bicyclists on the river crossing;
- More direct connections on each side of the river, consisting of stairs, ramps, and elevators, as well as pathway extensions that connect in with existing or planned facilities and public transit; and
- Many new or enhanced sidewalks, bike lanes, and crosswalks near the bridge and throughout the project area.

Since the publication of the DEIS in May 2008, and the selection of the LPA in July 2008, the CRC project team has continued to work with the Pedestrian and Bicycle Advisory Committee and project partners to refine route and facility design. The updated design, as described in Chapter 2 (Section 2.2) of the FEIS, is the outcome of a long collaboration process.

The Governors led a decision-making process regarding bridge type that resulted in the selection of the composite truss bridge type. The selection was understood to be driven largely by constructability and cost issues. The bike/pedestrian pathway remains largely unchanged in this design from that of the open web box. Designers will work to incorporate overlooks/belvederes into the truss design.

G-001-007

closer to the road edge and the natural light. The Open Web design had belvederes in the middle of the bridge to allow a way for people to get out from underneath the bridge and enjoy the view. The composite deck-truss will be in shadow most the day due to the 28 foot roadway overhang on both sides.

While the Truss bike cell would provide protection from the rain while crossing the river, the cover doesn't compensate for the feeling of danger that concerns a lot of existing bike riders and pedestrian users. The Bicycle Transportation Alliance withdrew support for the underneath bike cell proposed by the Open Web over security concerns. They also show no support for the Truss bridge type

The cable-stayed bridge does provide a world class bicycle and pedestrian experience.

The elevated pathway on the cable-stayed bridge will provide full 360-degree views all across the bridge. Though there will be noise from the traffic lanes on each side, the cable-stayed path will be safer for users because they will be visible from the road ways and not isolated below deck. It will serve the local bicycle and pedestrian needs as well as draw tourists. Rain exposure is really not a consideration, as it will exist on both sides of the river, anyway

The cable-stayed bridge is favored by the Bicycle Transportation Alliance and Cycle Oregon over the deck-truss bridge type *(Bicycle Transportation Alliance letter to Governor John Kitzhaber, February 23, 2011)*. **The cable-stayed bridge best keeps the commitment to the community for a world-class bike and pedestrian facility.**

Seismic Performance

G-001-008

While not addressed in the DOTs' recommendation, the Bridge Review Panel made it abundantly clear that the deck-truss bridge type has a higher seismic (predicted behavior) risk factor/risk ranking than the cable-stayed *(Bridge Review Panel Final Report, page 87)*, surely an essential consideration in this location.

4. Builds on resources to date

G-001-009

Since all of the environmental work that has been done to date applies to the bridge that has a larger footprint in the water than either the cable-stayed or the deck-truss both of these designs should be able to re-use the previous work in an equal manner.

In his email of March 11, 2011, Tom Warne confirmed: "… there has been over $100 million spent on this project to date. It would be a mistake to believe that this total is focused solely on the bridge structure itself. **Much of this amount has been spent on related environmental issues that must be addressed in order to prepare a complete and comprehensive Final EIS and not specifically on the bridge.**

He further stated: "Most of the $100 million will be useful regardless of the bridge type selected. Some additional expenditure will be required for any of the new bridge types being considered. This

G-001-008

While the Bridge Review Panel report does rank the cable-stayed bridge as a "1" and the composite deck truss as a "2", this is simply a comparative risk analysis, and seismic predicted behavior was just one of 15 factors ranked. It is not clear from the chart if the composite deck truss would actually be more vulnerable to seismic events than the cable-stayed bridge. The composite deck truss bridge would be built to current seismic standards.

G-001-009

Mr. Warne is correct that much of the environmental work done through 2010 continued to be applicable to the project even after the bridge type changed.

Also much of the concern regarding in-water work impacts on salmon is not just about the area of the footprint. The more important issue that affects impacts to salmon and other species is the duration and type of in-water work that would occur. Please see the response above to comment G-001-003 regarding NEPA compliance.

G-001-009

would have to be examined in greater detail and discussions held with resource agencies and their management to determine just what the impact would be. Absent those discussions (particularly at the executive level of these organizations) **it would be premature to predict how much additional time and money would be required for either bridge type**." *(Tom Warne email 1, March 11, 2011)*

5. Least impact on the river

G-001-010

With fewer pylons in the water (3 vs. 10-12) and with longer spans (830 ft vs. 500 ft) the cable–stayed bridge provides **safer commercial and private marine traffic** on the river compared to the deck-truss.

As can be seen in the following table, both the cable-stayed and the deck-truss have a smaller footprint than the original open web LPA design. The cable-stayed bridge has a significant advantage of fewer piers in the water.

In-Water Impacts	# of Piers	Footprint
Open-web LPA Design	12	58,500
Cable-Stayed	3	52,000
Deck-truss– Curved	12	52,800
Deck-truss–Straight	10	44,000

With footprint compacted into only three piers (vs. 10-12), the cable-stayed bridge most likely requires fewer temporary construction piles, reducing pile-driving noise and vibration impacts on fish and nearby neighborhoods.



Cable-stayed's three piers



Deck-truss' 12 piers

For comparison and background information, the CRC's previous LPA design with 12 piers required 2 near-shore cofferdams and 1224 temporary piles. Pile-driving would go on over 7 months per year for 6 years per the BiologicalOpinion. *(Endangered Species Act Section 7 Biological Opinion, January 29, 2011, p. 6)* Impact-driving would be limited to one hour per day, up to 142 days total so it would be a few days per month. Vibratory pile driving could go on any time during the year.

CRC staff has claimed that the cable-stayed bridge will require additional permanent pile supports in the sensitive shallow water near shore. However, the highly-qualified BRP, with much more cable-

G-001-010

Additional analysis of these bridge types identified more in-water work for the cable-stayed bridge than was assumed by the Bridge Expert Review Panel. The Panel also did not include any fish biologists or other environmental experts so the Panel's report assumptions regarding environmental impacts were not based on review or opinions by relevant experts.

The project partners developed consensus to move forward with the Selected Alternative in the ROD, which includes the composite deck truss bridge.

G-001-010

stayed bridge design and construction experience than the DOT staffs, has confirmed that in-water supports are NOT needed. Their report says, "Due to the low span-to-depth ratio...the end spans can be larger than would be expected with the standard cable-stayed bridges and the hold-down piers shifted apart from the last stays. The optimum ratio needs to be developed in the final design stages." *(Bridge Review Panel Final Report, p. 34)*

6. Encourages bids from multiple contractors

G-001-011

The Chair of the BRP, Tom Warne, indicated in his public presentation in Portland on February 17, 2011, that a cable-stayed bridge of this significance and size will easily attract several highly qualified bidders. Further, he indicated that any of the bridge types would not be likely to receive more than 3 or 4 bids because of the high cost of bid preparation. He noted that potential bidders will not spend the money if the number of competitors is too high. Note that TriMet only pre-qualified 3 bidders for the new cable-stayed Willamette River Transit Bridge, while the record shows 7 bidders responded to the Willamette River Transit Bridge RFQ. *(TriMet Resolution No. 10-12-65, authorizing construction contract for WRTB)*

7. Aesthetics

G-001-012

As mentioned in the BRP report, the "challenge facing the CRC team is to advance an option that offers aesthetic value, as determined by the communities, while still achieving the cost objectives of the project." It has been repeatedly noted in public forums that the public does not want another stripped down Glen Jackson-style bridge. From the onset of the Urban Design Advisory Group process, CRC leaders stated repeatedly their commitment was to building a better bridge than the I-205 crossing. As noted in the BRP Final Report *(p. 41)*, a cable-stayed bridge would be "perceived as a landmark by virtue of its basic form and scale." This is highly compatible with the stated objective of building a bridge that would be appropriate for crossing the Columbia River, a natural resource with deep meaning for regional history and identity.

A landmark bridge, best achieved by the above deck structure of cable-stayed option, will make future development of the Vancouver and Hayden Island waterfronts more desirable, as often cited by the local communities adjacent to the river in Oregon and Washington. This bridge type is a more context sensitive design, making historical reference to our vital maritime past while also reinforcing our regional livability and sustainability planning goals.

There are practical as well as aesthetic reasons for embracing this design. With the cable-stayed option, the towers are visible from a distance as you approach the crossing. This marks the river and places one in a broader context to one's surroundings. The towers offer a strong visual impact which naturally helps with wayfinding. With the above-deck orientation for bicycles and pedestrians, the cable-stayed bridge solution is safer and also presents a more desirable opportunity for public use and special events such as the Seattle to Portland Classic, one of the top ten recreational bike rides in the country, not to mention events like Bridge Pedal, Sunday Parkways, Cycle Oregon, Portland Marathon, etc. As the Bicycle Transportation Alliance has stated, world-class bike facilities would not include a below deck orientation.

G-001-011

This appears to be an accurate account of the presentation.

G-001-012

The bridge type selected by the two Governors will still provide opportunities for place-making and compelling aesthetics. The two Governors chose the composite truss design because it is a more appropriate bridge type for the engineering context, because it will not interfere with Pearson Airfield or Portland International Airport, and because it saves many millions of dollars.

As discussed in the FEIS, a replacement bridge over the Columbia River will include dramatically improved bicycle and pedestrian facilities by providing:

- A new 16- to 20-foot multi-use pathway over the Columbia River completely separated from vehicle traffic due to the design of the Stacked Transit Highway Bridge, and
- Protections from traffic noise, exhaust, and debris for pedestrians and bicyclists on the river crossing.

While there are some who would prefer the unobstructed views of an "above deck" bike facility, others prefer the under deck option which buffers riders from vehicular noise and spray, and protects riders from rain.

G-001-012

The architectural design of the bridge should stem from the engineered response to the inherent structural needs particular to the bridge type. Of the two options, the cable-stayed bridge offers the best opportunity to maximize structural efficiency and exploit the natural advantages of the various cable-stayed bridge elements, in other words, funders will 'get more design bang for the buck'. The long, thin horizontal bridge deck punctuated by three slender towers is an efficient and elegant design solution in contrast to the more massive piers of the Deck-Truss. The cable-stayed bridge will appear to float above the river, and with its more sculpted forms and delicate cables, create an ever-changing display of dappled light and shadow. This is a more holistic approach to design and doesn't rely on superfluous add-ons to try to "mitigate" or "improve" the design of the more ubiquitous deck-truss option.

As the expert Bridge Review Panel stated, "..."... it would be very difficult to develop a composite deck-truss or any other girder bridge to a form that could readily be perceived as having a similar signature appearance to the cable-stayed and arch alternatives. As a result, it is difficult to present any truss bridge as an architectural solution that would be appropriate for this special crossing of the Columbia River." *(Bridge Review Panel Final Report, p. 69)*

Perhaps most important, as has already been observed, this design helps galvanize public support for the project. Selecting the right design now will bring the region together in a way that will finally make the bridge a reality.

8. Best path forward

G-001-013

The best path forward is to build the bridge that creates the largest buy-in for the project, with the least legal vulnerability, at an affordable cost.

The fastest and surest path to start the bridge project is the cable-stayed bridge type.

The deck-truss option has much less consensus, making it vulnerable to further legal delay and riskier for funding. The reluctant support (due to the fears of delay) for the Truss design is not the kind of support that will motivate the region or the congressional delegations.

Key federal funding is dependent on strong support, a message reinforced by the BRP chair and Senator Murray. The cable-stayed option has much broader support, including from elected leaders, neighborhood associations near the river, CRC Advisory groups, and bike advocates. This support is based on the excitement of a good design, and the ability of the cable-stayed option to meet all of the stated criteria in an overall better way.

The Truss bridge is likely to have little long-term public support. Without support from affected neighborhoods, costly and lengthy project delays will occur. While the Truss bridge is a simpler construction, it is visually indistinguishable from the former, flawed Open Web LPA design. Likewise, the apparent short-term benefit of lower cost is negated if efforts to maintain the current curved alignment are retained.

G-001-013

The project is currently planning to use the Design-Build process for bridge construction and potentially for construction of other elements.

The cable-stayed bridge was considered but not advanced, as discussed in Chapter 2 of the FEIS. This UDAG comment has outlined some reasons that it should have been selected. Each is addressed as follows:

- it would not speed the beginning of construction compared to the composite truss type;
- it's not clear that it has more support for funding;
- it provides no obvious advantage in terms of duration of construction;
- it would not have lower permitting and environment risks; and
- it would not be less expensive to construct than the composite truss.

G-001-013

The Bridge Review Panel experts were correct in stating that significant cost-savings to the project can be achieved overall without compromising the bridge structure itself. There is only one chance to build the structure over the river, while other project components can be phased or redesigned.

Use Design/Build Process

According to BRP chair, Tom Warne, the best path forward is for a change of approach to a Design/Build process for the bridge and adjacent interchanges on each shoreline. The cable-stayed construction period can easily fit the schedule through a Design/Build process, a construction process any of the three options can use. Further, a design/build process for the bridge would eliminate many of the design, procurement, and construction risk differences claimed between the deck-truss and cable-stayed options. This process has recently been or is currently being utilized for projects including the Tacoma Narrows Bridge, the Alaska Viaduct replacement and the new 620 Floating Bridge in Seattle.

Cable-stayed Bridge: Build a Better Bridge. Faster.

- It's faster to begin construction with broader support for funding.
- It's possible to build on time.
- It has fewer permitting and environmental risks.
- All options need FAA review but issues can be resolved with broad support.
- Is affordable.
- Cable-stayed is better for commerce and livability.
- Cable-stayed Bridge is the best path forward.

The Bridge Review Panel Final Report is correct in stating, "the new Columbia River crossing represents the most dramatic river structure in the northwest and may be one of the last major crossings ever to be built along the West Coast."

Citations throughout this white paper are from the following attached documents:

- Washington Department of Transportation and Oregon Department of Transportation KEY FINDINGS AND RECOMMENDATION RELATED TO BRIDGE TYPE, February 25, 2011 - http://www.columbiarivercrossing.org/FileLibrary/GeneralProjectDocs/DOTs_Draft%20Recommendation.pdf
- Columbia River Crossing Bridge Review Panel Final Report, February 3, 2011 - http://www.columbiarivercrossing.com/FileLibrary/GeneralProjectDocs/BRP_Report.pdf
- Council on environmental quality, executive office of the president: A Citizen's Guide to the NEPA - http://ceq.hss.doe.gov/nepa/Citizens_Guide_Dec07.pdf
- FAA Hazard Determination Process, from February 18, 2011, Project Sponsors Council Meeting - http://www.columbiarivercrossing.org/FileLibrary/MeetingMaterials/PSC/PSC_MM_021811/PSC_MM_021811_6_FAATimeline.pdf
- Vancouver Aviation Advisory Committee letter to Vancouver City Council, March 8, 2011
- CRC Pedestrian and Bicycle Advisory Committee (PBAC) memorandum to Columbia River Crossing Task Force, June 17, 2008 - http://www.columbiarivercrossing.org/FileLibrary/MeetingMaterials/PBAC%20DEIS%20LPA%20Memo%20061708.pdf
- TriMet memorandum Resolution No. 10-12-65, authorizing contract for Willamette River Transit Bridge - http://trimet.org/pdfs/meetings/board/dec-10/Res-10-12-65.pdf
- Bicycle Transportation Alliance letter to Governor John Kitzhaber, February 23, 2011
- UNITED STATES DEPARTMENT OF COMMERCE National Oceanic and Atmospheric Administration Endangered Species Act Section 7 Biological Opinion, dated January 19, 2011
- Tom Warne email 1, March 11, 2011
- Tom Warne email 2, March 11, 2011

Bridgeton
NEIGHBORHOOD ASSOCIATION

October 24, 2011

Federal Highway Department

Federal Transit Agency

Dear Sirs,

N-001-001 The Bridgeton Neighborhood continues to express support for building a new I-5 bridge as quickly as possible. However, we know that our quality of life will be impacted by the construction of the new I-5 bridge. We hope it will improve with the bridge completion. We are reminding you of promises made to the residents of North Portland.

Prior commitments that need to be upheld

The FEIS shows that the Arterial Bridge from Marine Drive to Hayden Island and the East Side Multi-use Path are now options. Our position is that these items promote the safety and well being of the people in the Bridgeton neighborhood as well as those on Hayden Island and East Columbia. Consider that Fire Station #17 is the first responder for emergencies on Hayden Island as well as East Columbia and Bridgeton neighborhoods. Providing a non-freeway access option provides security and safety to the area as well as promoting alternative modes of transportation since walking and biking are popular in North Portland.

N-001-002 If the Arterial Bridge and East Side MOP are not built, access from Marine Drive will use the collector-distributor lanes mixing freeway bound traffic with local access traffic. We have been told that the Arterial Bridge is going to be used if the North Portland Harbor Bridges collapse during an earthquake. Are there any plans to retrofit the North Portland Harbor Bridges if the Arterial Bridge is eliminated?

N-001-003 The CRC has attended many Bridgeton meetings and has always said they want to work with the public to support their needs. We see nothing in this plan that shows a sincere desire to support the need for a bike and pedestrian path along the top of the levee. We would like to see the project support the completion of bike and walk paths including those on the Bridgeton Trail to encourage people to use alternative methods of transportation.

N-001-004 We also see broken promises to the Hayden Island community that affect residents in all of North Portland. We support the Hayden Island Plan which strives to make a viable connected community. Neighborhoods and retail have a symbiotic relationship and location is a key component. The FEIS report shows that most of the businesses in the core of the Island are being removed. Many will be replaced with several wetland marshes because of the CRC Storm Management Plan. Is it possible to move these ponds elsewhere and leave this prime retail property for business development?

Incorrect data used for impact statements and assumptions

N-001-005 The FEIS states that there is a total population for Bridgeton of 39 people. The 2000 census showed a population of 573 and we have added many high density residences since then pushing our population to over 1200 many of whom are over 65. It is true that we have few people with disabilities because the lack of sidewalks

N-001-001

The benefits you have described for Option A are accurate. Option A was the preferred option in the FEIS and is part of the Selected Alternative in the ROD.

N-001-002

Option A is part of the Selected Alternative in the ROD.

There are currently no plans to provide a major seismic retrofit of the existing North Portland Harbor bridge.

N-001-003

The project will complete the pathway connecting the Bridgeton neighborhood to the Marine Drive Trail, west of the project. Please see Section 2.2.3 of the FEIS.

N-001-004

The stormwater facilities shown in the FEIS will continue to be refined as design work progresses. Under the terms of the biological opinion (BO), the CRC project must treat stormwater runoff using bioretention, bioslopes, infiltration ponds, porous pavement, constructed wetlands, and vegetated and soil amended swales designed for infiltration. Based on the information we have on file, stormwater runoff is currently not treated before being released to North Portland Harbor or the Columbia River.

The Hayden Island Redevelopment Plan states that runoff from local streets will be treated in roadside planters and that CRC stormwater will be managed in a “green, state-of-the-art manner.” Although the Hayden Island Plan map did not show the constructed wetlands, these are a “green” concept for stormwater treatment, and have been shown in project designs as early as May 2009. The stormwater treatment

N-001-005 and public transportation make it hard for anyone with a disability to live in our area.

N-001-006 The FEIS lists many buses that serve the Bridgeton Neighborhood. Bridgeton is serviced by one bus which runs only during rush hours. We currently have to walk across a muddy path on private property on the levee or walk on the side of Marine Drive to access the buses and Max as listed in the FEIS. We feel that walking and biking on the side of Marine Drive is dangerous, because cars are frequently parked on the side of the road forcing people to walk on the very busy Marine Drive itself.

These inaccuracies tend to imply that there will be minimal impact to our population. Our population has grown using a very high density housing model. We need to protect our continued access to places of work and stores. Any loss of direct access between the neighborhoods is unacceptable.

Issues that impact Peninsula Drainage District 2

N-001-007 Bridgeton and East Columbia are joined together forming Peninsula Drainage District 2. Bridgeton has already lost many trees to meet the "No trees on Levees" standards of the Army Corp of Engineers. We know firsthand how costly it can be to fight their standards. We have heard that the CRC plans include placing concrete bridge supports into the levee. Having years of experience on levee issues with the Army Corp of Engineers leaves us understanding that this will lead to a difficult, expensive, and time-delaying fight. Our fear is that this sort of issue will cause the construction of the Arterial Bridge to be eliminated or delayed.

N-001-008 We need to save as many of the old growth trees in the area as possible. Removing old growth trees will add to the run off that has to be managed by the drainage districts in addition to adding an industrial blight appearance of the area. Removing trees harms the habitat for everyone.

We encourage you to use your resources

N-001-009 Bridgeton residents are aware of access issues for our neighborhood and ask to be involved in design plans relating to this access to the freeway and to the island. We know that the CRC construction will increase the distance and drive time to the island from Marine Drive. We are currently limited to three streets that enter onto Marine Drive for travel into and out of Bridgeton. The intersections at Anchor Way and Gantenbein are frequently blocked by traffic waiting to circle over, then under and enter I-5 north bound. Encouraging walking and biking to the island is a worthy goal. We would be able to respond

N-001-010 to issues that impact us if we were allowed to work within the process instead of being told what is best for us.

N-001-011 Bridgeton residents are in favor of building a new bridge for I-5 to cross the Columbia. We would like to see an aesthetically pleasing structure which will be viewed as something to visit and admire. For the safety and welfare of all of North Portland, we need the direct access to and from Hayden Island by car, by bicycle and on foot.

Sincerely,

Leslie Sawyer,
Co-Chair Bridgeton Neighborhood Association

proposed in the FEIS does include the "green streets" approach proposed in the Hayden Island Redevelopment Plan to the extent feasible. This approach to stormwater treatment is not suitable for streets located under bridges (where it will be difficult to establish plants) or where streets are at or below the seasonal high groundwater table. In addition, care was taken to ensure that the facilities are located on land that is either currently owned by ODOT or would need to be acquired for CRC construction, independent of stormwater management. The current proposed water quality facilities meet these conditions.

While wetlands are typically permanent bodies of water, they are not stagnant. Water flows through them during frequent rainfall events, producing conditions that are not conducive to mosquito larval development. As stated above, a constructed wetland is one of the BMPs listed by NMFS in its BO as providing the level of treatment necessary to protect endangered species found in the Columbia River. As such, the discharges are considered by the agency to meet its stringent requirements.

We will continue to review the developing design to determine whether additional streets lend themselves to this method of runoff treatment. Regardless, the project still needs to manage runoff from almost 28 acres of impervious area consisting of I-5 pavement across Hayden island, associated ramps, the elevated transit guideway, and structures.

N-001-005

The project will be able to improve the conditions for residents in the Bridgeton Neighborhood. The Bridgeton trail will be connected, with accessible facilities, to the Marine Drive Trail and the river-crossing network.

N-001-006

The project will improve the sidewalks and roadways, such as Marine

Matt Whitney,
Co-Chair Bridgeton Neighborhood Association
(Out of town and not available to sign the report)

Supported by the following board members:

Pat Bartch
Richard Brown
Scott Niessen
Anne Neuenschwander
Debbie Robertson
Elizabeth Sanders
Brian Stipak
Walter Valenta
Chuck Wilson

Way, that connect your neighborhood with the MAX station, bus stops, and the rest of the transportation network.

N-001-007
We have been coordinating with the U.S. Army Corps of Engineers and the Peninsula Drainage District on the impacts to the levee. We are expecting to receive a permit but do not yet know what conditions may be associated with it. The project's intent is to build the local multimodal bridge.

N-001-008
The project will attempt to avoid tree removal as much as possible. This is an appropriate issue for on-going coordination with the community.

N-001-009
The LPA has a fairly recently updated design for North Portland. The Marine Drive, Vancouver Way, Martin Luther King Jr Boulevard, and Union Court configuration provides improvements in safety, access, and intersection operations.

N-001-010
There are numerous opportunities to become or stay involved in the planning and design of the CRC project. Please contact the CRC office directly for more information.

Multiple methods have been used to engage the public so as to address the needs of a wide variety of people in the project decision-making process. Public feedback has helped guide the outreach effort. Examples include workshops with facilitated small-group discussions, open houses where participants can talk one-on-one with staff, public hearings, presentations and discussions at community and neighborhood-sponsored meetings (often at the group’s request), and

advisory group meetings where CRC seeks recommendations from a citizen committee. These events and meetings have taken place at a variety of locations, days of the week, and times of the day to meet the needs of the entire community. For more information on the project's public outreach, please see Appendix B of the FEIS.

N-001-011
Thank you for your comments.

October 24, 2011

Federal Highway Department

Federal Transit Agency

Dear Sirs,

N-002-001

I am the Co-Chair of the Bridgeton Neighborhood and the neighborhood continues to express support for building a new I-5 bridge as quickly as possible. This weekend we held a neighborhood function where over 50 people expressed opinions about the bridge after looking at the chart of the newest plans for Option A.

For years, most of the neighbors have been apathetic about the plans to build a new bridge. They do not think it will happen in their lifetime and they have been disappointed by the proposed added drives to access the freeway by driving south on Vancouver into the heart of all of the truck traffic and then northwest on MLK and Marine Drive. People are actually enthusiastic about the plan to have access to Hayden Island on an Arterial Bridge from Marine Drive. They love the idea of being able to drive, bike or walk to Hayden Island without having to get into freeway and heavy truck traffic. They are optimistic that Hayden Island business will return. They also like the idea of a new more direct way to go to the Kenton area where half of us have our post office.

They also expressed a desire to finally have a bike and pedestrian path from the west end of Bridgeton Road to I-5 and the proposed East Side MOP or the Arterial Bridge. Yes, we would really like to see the completion of the proposed Bridgeton Trail.

Everyone did not like the idea that we would have to drive several extra miles in heavy truck traffic to be able to use the collector-distributor lanes packed with freeway bound traffic in order to drive to Hayden Island if the Arterial Bridge plan is dropped.

I know that we will be impacted for years during this construction, but I am excited about the potential for improved access when the bridge and ramps are completed. I look forward to free flowing traffic on Marine Drive when there are no longer total stops of traffic caused by the opening on the bridge and frequent accidents. It will be great to be able to drive on a free flowing Marine Drive during rush hour instead of getting caught in traffic waiting to cross over I-5, under it and then merge onto it just prior to the Hayden Island merge. This back log of traffic frequently closes access to two of our three roads that connect to Marine Drive.

N-002-002

I hope that officials from the CRC, the state, and the city will continue to work with us to make an aesthetically pleasing bridge that gives us better access to Hayden Island, Portland, and Vancouver.

I am happy to express my support for the construction of a new I-5 bridge and hope that the promise of an Arterial Bridge and the East Side MOP will be retained in the project plan that goes forward to completion.

Sincerely,

Leslie Sawyer,
Co-Chair Bridgeton Neighborhood Association

N-002-001

Aesthetics will be an important consideration during final design and citizen input will be sought.

The Selected Alternative described in the ROD includes the local multi-modal bridge and the multi-use path mentioned in this comment. The project will connect the pedestrian network through the Marine Drive interchange with the western terminus of the Bridgeton Trail.

N-002-002

Please see response to comment N-002-001 above.

October 24, 2011

Ms. Heather Wills
CRC Environmental Manager
700 Washington Street, Suite 300
Vancouver, WA 98660

ECC: Gerald Solomon FHWA HEPE Gerald.solomon@dot.gov
Carl Bausch FTA carl.bausch1111@dot.gov

Dear Ms. Wills,

N-003-001

Hayden Island Neighborhood Association (HINooN) is the City of Portland Oregon recognized neighborhood association representing the 2,200 residents and businesses on Hayden Island. Many of our Board Members have served on multiple committees throughout the development of the CRC project.

HINooN and it's constituents are at "ground zero" of the CRC project with I 5 being the only way to access or to leave our island. The project will divide our community in half. Nonetheless, HINooN is committed to supporting the Columbia River Crossings including the plan designs agreed upon after diligent work by all. We ask for a recommitment from CRC to:

- Follow through with the agreed upon plan designs including the Arterial Bridge,
- The Hayden Island Plan,
- Mitigation
- The Metro Conditions of Approval – Mitigation & Community Enhancement
- Relocate or build a new floating home marina for 31 homes displaced

AGREED UPON PLAN DESIGNS

N-003-002

Considerable time and energy has been expended by all to create plans designs which are workable, admirable and acceptable by all parties. The designs which are missing or greatly reduced include the Light Rail Station (restore agreed designs, add parking facilities for island residents, east west transit bus during construction and after); Stormwater treatment is currently shown in CRC plans for areas designated for Neighborhood Commercial use in the Hayden Island Plan (change to in situ treatment on bridges or pump to Marine Drive treatment area); Parks to be developed on the north and south island sides of the construction area (to be ceded to city, county or state), and the protection of the existing businesses as the start of the Hayden Island Plan retail center.

THE HAYDEN ISLAND PLAN (the "HIP")

N-003-003

The plan was developed with over 20 years of studies and approved by the Portland City Council timed to be available for the CRC planning. It included:

A more walkable residential community that protects the quality of the existing residential neighborhoods of both land-based and floating homes.

N-003-001

Thank you for years of collaboration on this project. Your specific issues are addressed with the following specific responses.

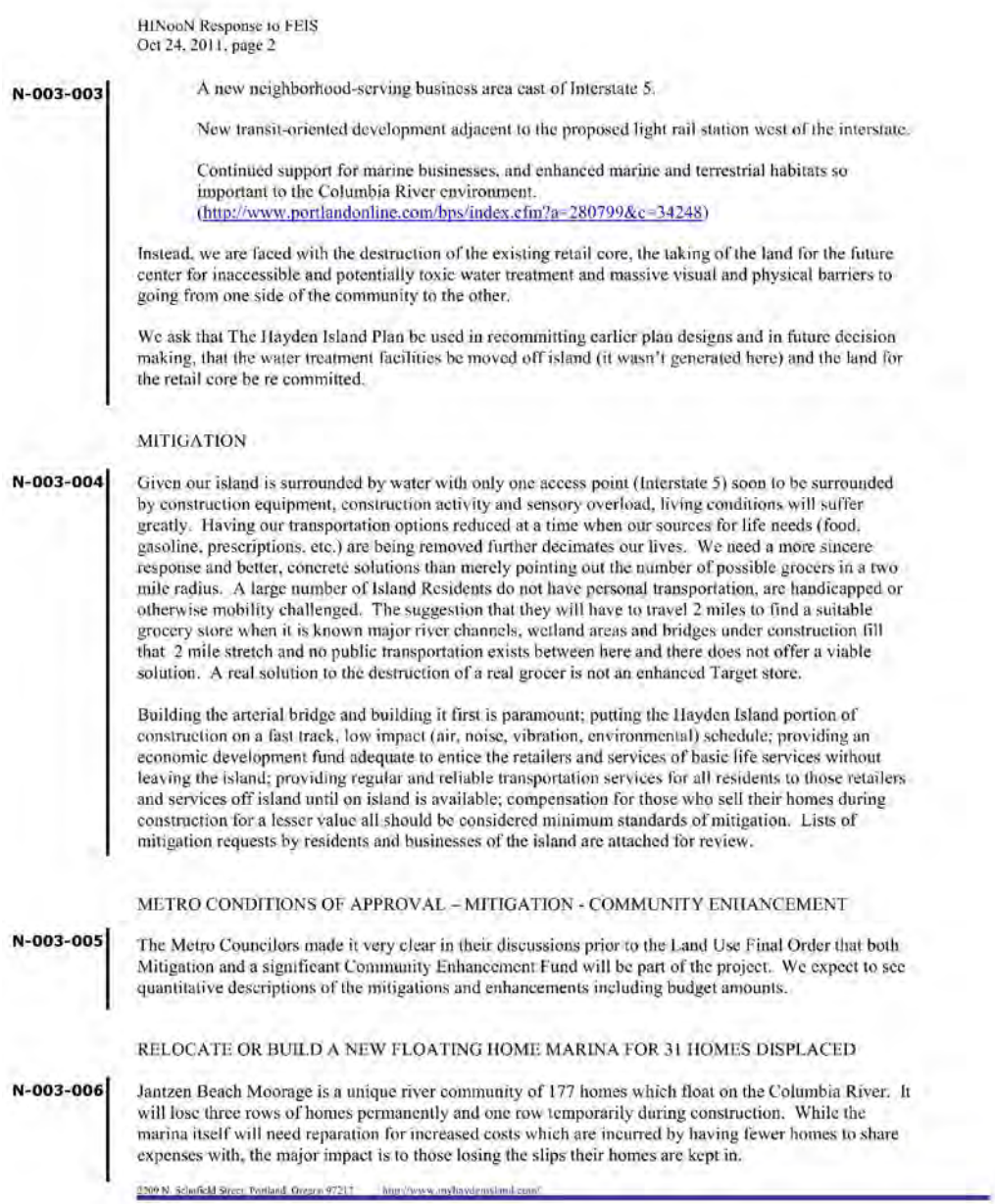
N-003-002

Consistency with each of these plans and prior design decisions is discussed below.

N-003-003

The stormwater facilities shown in the FEIS will continue to be refined as design work progresses. Under the terms of the biological opinion (BO), the CRC project must treat stormwater runoff using bioretention, bioslopes, infiltration ponds, porous pavement, constructed wetlands, and vegetated and soil amended swales designed for infiltration. Based on the information we have on file, stormwater runoff is currently not treated before being released to North Portland Harbor or the Columbia River.

The Hayden Island Redevelopment Plan states that runoff from local streets will be treated in roadside planters and that CRC stormwater will be managed in a "green, state-of-the-art manner." Although the Hayden Island Plan map did not show the constructed wetlands, these are a "green" concept for stormwater treatment, and have been shown in project designs as early as May 2009. The stormwater treatment proposed in the FEIS does include the "green streets" approach proposed in the Hayden Island Redevelopment Plan to the extent feasible. This approach to stormwater treatment is not suitable for streets located under bridges (where it will be difficult to establish plants) or where streets are at or below the seasonal high groundwater table. We will continue to review the developing design to determine whether additional streets lend themselves to this method of runoff treatment. Regardless, the project still needs to manage runoff from almost 28



HINooN Response to FEIS
Oct 24, 2011, page 2

N-003-003

A new neighborhood-serving business area east of Interstate 5.

New transit-oriented development adjacent to the proposed light rail station west of the interstate.

Continued support for marine businesses, and enhanced marine and terrestrial habitats so important to the Columbia River environment.
(http://www.portlandonline.com/bps/index.cfm?a=280799&c=34248)

Instead, we are faced with the destruction of the existing retail core, the taking of the land for the future center for inaccessible and potentially toxic water treatment and massive visual and physical barriers to going from one side of the community to the other.

We ask that The Hayden Island Plan be used in recommitting earlier plan designs and in future decision making, that the water treatment facilities be moved off island (it wasn't generated here) and the land for the retail core be re committed.

MITIGATION

N-003-004

Given our island is surrounded by water with only one access point (Interstate 5) soon to be surrounded by construction equipment, construction activity and sensory overload, living conditions will suffer greatly. Having our transportation options reduced at a time when our sources for life needs (food, gasoline, prescriptions, etc.) are being removed further decimates our lives. We need a more sincere response and better, concrete solutions than merely pointing out the number of possible grocers in a two mile radius. A large number of Island Residents do not have personal transportation, are handicapped or otherwise mobility challenged. The suggestion that they will have to travel 2 miles to find a suitable grocery store when it is known major river channels, wetland areas and bridges under construction fill that 2 mile stretch and no public transportation exists between here and there does not offer a viable solution. A real solution to the destruction of a real grocer is not an enhanced Target store.

Building the arterial bridge and building it first is paramount; putting the Hayden Island portion of construction on a fast track, low impact (air, noise, vibration, environmental) schedule; providing an economic development fund adequate to entice the retailers and services of basic life services without leaving the island; providing regular and reliable transportation services for all residents to those retailers and services off island until on island is available; compensation for those who sell their homes during construction for a lesser value all should be considered minimum standards of mitigation. Lists of mitigation requests by residents and businesses of the island are attached for review.

METRO CONDITIONS OF APPROVAL – MITIGATION - COMMUNITY ENHANCEMENT

N-003-005

The Metro Councilors made it very clear in their discussions prior to the Land Use Final Order that both Mitigation and a significant Community Enhancement Fund will be part of the project. We expect to see quantitative descriptions of the mitigations and enhancements including budget amounts.

RELOCATE OR BUILD A NEW FLOATING HOME MARINA FOR 31 HOMES DISPLACED

N-003-006

Jantzen Beach Moorage is a unique river community of 177 homes which float on the Columbia River. It will lose three rows of homes permanently and one row temporarily during construction. While the marina itself will need reparation for increased costs which are incurred by having fewer homes to share expenses with, the major impact is to those losing the slips their homes are kept in.

2209 N. Schmeer Street, Portland, Oregon 97217 http://www.myhavenisland.com/

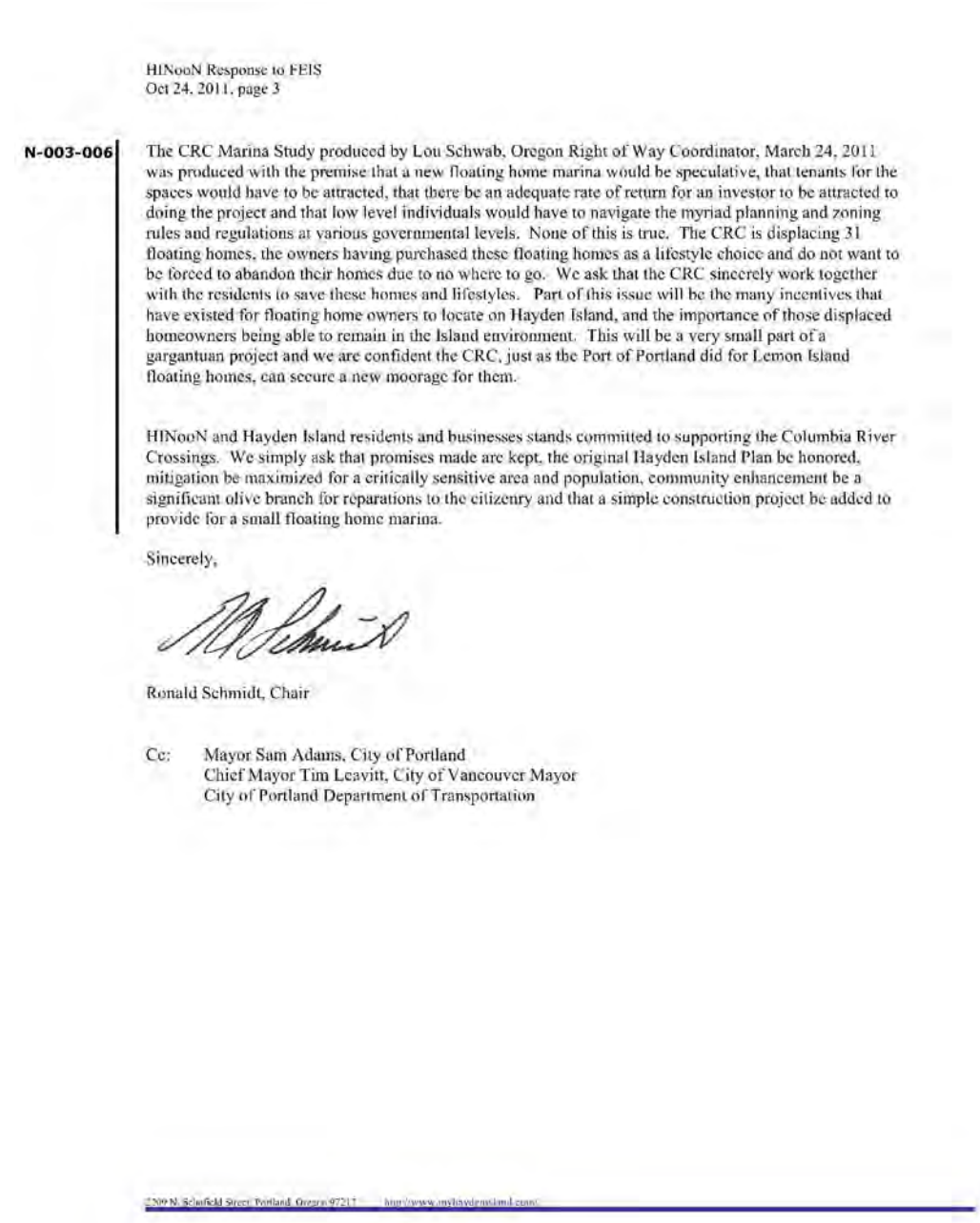
acres of impervious area consisting of I-5 pavement across Hayden island, associated ramps, the elevated transit guideway, and structures.

N-003-004

The project will continue to work with Island residents and organizations on the development of construction-period mitigation plans. The project has already committed to maintaining through-traffic capacity on the Interstate and developing a shuttle-type transit service during construction to assist those who are mobility challenged. And, as explained in the FEIS, there will be robust programs to protect businesses during construction, maintain access and visibility for these businesses, encourage contractors to spend money at these local businesses, etc. The negotiations on specific relocations (both for homes and businesses like the Safeway Store) are somewhat private matters, specific to each property owner. These discussions have recently accelerated and will continue through 2012. As the design is refined, the project will work with many businesses on the island that have been documented as displacements. Some of these businesses may only need changes to their parking lots or small parts of their buildings. Only after the Record of Decision and the further refinement of the designs can these individual negotiations begin in earnest. Part of these negotiations will address property values and the unique circumstance that the real estate market collapse has created. DOT right-of-way professionals are working on mechanisms that will appropriately compensate the displaced homeowners who owe more than their property is worth.

N-003-005

In the last three years the CRC project team, the Project Sponsors Council, and CRC advisory groups have focused on incorporating a wide range of community enhancements into the project. The project has looked for ways to leverage the highway and transit investments into additional improvements for project neighborhoods. These



HINooN Response to FEIS
Oct 24, 2011, page 3

N-003-006

The CRC Marina Study produced by Lou Schwab, Oregon Right of Way Coordinator, March 24, 2011 was produced with the premise that a new floating home marina would be speculative, that tenants for the spaces would have to be attracted, that there be an adequate rate of return for an investor to be attracted to doing the project and that low level individuals would have to navigate the myriad planning and zoning rules and regulations at various governmental levels. None of this is true. The CRC is displacing 31 floating homes, the owners having purchased these floating homes as a lifestyle choice and do not want to be forced to abandon their homes due to no where to go. We ask that the CRC sincerely work together with the residents to save these homes and lifestyles. Part of this issue will be the many incentives that have existed for floating home owners to locate on Hayden Island, and the importance of those displaced homeowners being able to remain in the Island environment. This will be a very small part of a gargantuan project and we are confident the CRC, just as the Port of Portland did for Lemon Island floating homes, can secure a new moorage for them.

HINooN and Hayden Island residents and businesses stands committed to supporting the Columbia River Crossings. We simply ask that promises made are kept, the original Hayden Island Plan be honored, mitigation be maximized for a critically sensitive area and population, community enhancement be a significant olive branch for reparations to the citizenry and that a simple construction project be added to provide for a small floating home marina.

Sincerely,

Ronald Schmidt, Chair

Cc: Mayor Sam Adams, City of Portland
Chief Mayor Tim Leavitt, City of Vancouver Mayor
City of Portland Department of Transportation

improvements are beyond the benefits identified as the project's purpose and need. These tangible improvements include new local roads and improved local flow and connections for Hayden Island residents; better bike and pedestrian access to the improved facilities; new bike and pedestrian trails; and a separate bridge for local auto access from North Portland to Hayden Island. We know there is more to be done. The CRC remains committed to aggressively maximizing and leveraging resources to bring additional benefits and improvements to our community. Two options have been identified for further exploration, both include a financial set-aside of a specific amount dedicated to a specific purpose. One approach is a project-specific community enhancement fund. There is some history with such an approach - the Delta Park 1-5 widening project (2006) and Metro's solid waste program (1991) are two examples. The other approach is a different concept, a regional fund established by the state to benefit the neighborhoods and communities in close proximity to 1-5 and the CRC project. Both approaches have been successfully implemented in the Portland region and will help inform this effort. We need to be clear about both of these approaches - neither will be easy. Both approaches have limitations and legal restrictions associated with anticipated funding sources. Both will require legislative support. Both will likely need enabling legislation and both will require funding.

N-003-006

Chapter 3 (Section 3.3) of the DEIS disclosed all known floating home displacements that would result from the two highway and two transit alternatives crossing the North Portland Harbor (pages 3-105 and 3-112, respectively). The DEIS also listed potential mitigation measures tailored to suit the unique situation of the floating home community (page 3-119).

For the FEIS analysis, the CRC project team worked to better understand the organization of the floating home communities in the North Portland Harbor. As presented in Chapter 3 (Section 3.5) and

Hayden Island Needs related to the CRC Project

Pre-construction Needs

N-003-007 Specific agreement on mitigations, and community enhancement funds before the project is underway and recognition of the status of the Manufactured Home community as an Environmental Justice (EJ) community.

N-003-008 Construction Information Center on the Island, a website, and a Community Hot Line (for residents to call for any emergency caused by construction and to answer questions about street closures, etc.), plans for Island access and circulation during construction including a monthly island news letter with CRC construction information.

Assistance for businesses planning to stay on the Island and new businesses needed during construction (e.g. food carts, farmer's markets, grocery, pharmacy). We understand the new Target will have some groceries and a pharmacy but Target will not have a full service grocery. Inclusion of a full service grocery to replace Safeway is uncertain at this point but critically needed.

Early construction of the Hayden Island local arterial bridge to ease traffic bottlenecks on/off the island during construction.

Give local residents priority for new project jobs on the island (e.g. flaggers, info center hosts, environmental protection monitors, Hot Line operators, newsletter reporters/editors, etc).

A plan for local bus/shuttle service during construction.

N-003-009 Assistance for floating home owners being displaced.

N-003-010 Assistance for individual EJ community residents who might be sensitive to construction impacts and disturbance.

N-003-011 Enhanced security services for vacant properties and vacant land during right of way acquisition.

N-003-012 Ongoing community engagement and participation (probably through the Portland Working Group and sub-groups) beginning now and continuing through project completion.

Needs During Construction

Crime Prevention

N-003-013 Add extra security services for crime prevention/mitigation during construction. That would be

Chapter 6 (Public Involvement) of the FEIS, the team coordinated with floating home owners, moorage owners, Boards, and management to gather address and ownership information for each floating home. The impacts to individual floating homes are described in Chapter 3 (Section 3.3) of the FEIS and listed in Appendix E - List of Potential Property Acquisitions.

In the course of conversations with potentially affected property owners, CRC staff received inquiries about the potential for constructing a new marina to accommodate displaced floating homes. To better understand issues related to new marina permitting and construction, project staff conducted research on the development of marinas. This research found likely challenges to developing a new floating home marina, including the challenge of receiving permits through local jurisdictions and environmental resource agencies. The project is not pursuing construction of a floating home marina.

As with any other acquisitions, the CRC will obtain independent appraisals to determine fair market value for each home that must be displaced but cannot be relocated. Qualified acquisition agents will work closely with each floating home owner to try to arrive at mutually agreeable terms for the purchase of each home. The agents will also provide relocation assistance to all displaced occupants.

N-003-007

Regarding a Community Enhancement Fund, please see response N-003-005.

Regarding the Manufactured Home Community being an EJ community:

Updated population and demographic information can be found in Chapter 3 (Section 3.5) of the FEIS. The displacement survey (which focused on the most directly impacted households) was undertaken in

N-003-013 for both businesses & residences paying particular attention to vacated homes/businesses and preventing the homeless from living there.

Island Livability

Have an Observation Deck/Viewing Platform so people can safely observe the construction.

Have a local bus/shuttle service during construction.

If the island is without a grocery store for a period of time, provide on-call island shuttle services for getting disabled, senior and non-drivers to a grocery store.

Traffic Management:

Cars – always have two way streets going east/west across the bridge area. One way streets with flaggers are simply not adequate for the traffic on the island.

Bicycles/scooters/pedestrians – Have smooth surface paths east/west across the bridge area for bicycles and scooters (people with limited mobility) and foot traffic.

Have a specific plan for getting emergency vehicles on/off the island during construction with no delays.

Vibration

N-003-014 Home inspections of before and after construction for any possible damages caused by construction vibrations especially for those that are closer to the staging areas and river.

Public Health and Safety

N-003-015 The Island Community has not seen the FEIS but we expect it will contain detailed mitigation measures for protection of Island Residents, visitors and workers. Specific impacts of concern include:

Dust and other air pollutants There must be dust and air quality monitoring and control measures. Those who live closest to the staging and construction areas will be most exposed to dust and contaminants for a lengthy period. The respiratory health of seniors and other sensitive receptors must be protected. Home air conditioners, air filtration, replacements for louvered windows, and other measures may be necessary for protection from dust and fumes, especially those nearest the staging areas. The cleanest available diesel technology must be used for all construction equipment. Regular health care checkups and medical attention must be available for residents with existing respiratory problems, regardless of whether or not they have health insurance.

response to assertions that the Census data misrepresented the affected community. The U.S. Census data indicate that, as a whole, the Hayden Island neighborhood has a lower proportion of minority and low income households than the City of Portland, Multnomah County, or in the Project study area. Hayden Island ranks near the lower end of the spectrum in both minority and low income household composition when compared with all other neighborhoods in the study area. Households within the Manufactured Home Community were not surveyed, but these households also will not be displaced. The CRC recognizes that there are low income and minority households on Hayden Island and that they may be more frequently found within the Manufactured Home Community than elsewhere on the island. The project will consider the potential for disproportionate impacts to any low income or minority household regardless of the demographics of the surrounding neighborhood.

N-003-008

The CRC project is working to minimize temporary impacts during construction that could impede travel in the project area. These temporary effects were described in Chapter 3 (Section 3.1) of the DEIS, and are refined in Chapter 3 (Section 3.1) of the FEIS, which also includes proposed measures to mitigate these impacts.

As the project moves into its final design phase, the CRC project team will complete a construction staging plan that will address, in greater detail, temporary closures, detours, and access on the highway and local streets affected by construction. This construction staging plan will indicate to contractors the proposed sequencing of construction based on DOT standards. Contractors are often given the opportunity to modify the construction staging plan to maximize construction efficiency and economy, but are required to fulfill DOT performance standards for temporary impacts.

N-003-016

Noise Temporary sound barriers, low noise equipment, air conditioning (so residents can keep windows closed) and other noise mitigation measures must be used as necessary to protect nearby residents and businesses.

Asbestos and other contaminants - Contaminants in buildings to be demolished (like the Thunderbird Hotel) and in soil to be disturbed (especially in the historic landfill along Hayden Bay Drive) must be identified and properly handled during disposal.

Light Nighttime lighting of construction and storage area is necessary for public safety and security but nearby residents must be protected from light pollution.

Business

N-003-017

From the very small amount of construction around Target and on Hayden Island Drive in preparation for building the new Target, business in the mall has dropped off considerably. Access mitigation measures must be implemented to protect Island businesses during the freeway, interchange, and bridge construction. Provide extra signage on I-5, in Vancouver, and in Portland south of Hayden Island showing that businesses on Hayden Island are open for business during construction.

Hayden Island Features Expected from Basic Funding of Project

N-003-018

The Island Community expects completion of all project features shown on CRC maps of the latest preferred project alternative. These include:

- The Extension of Tomahawk Island Drive under the freeway,
- The local arterial bridge connection to the Marine Drive Interchange area,
- All freeway and local roads and structures for island access and circulation,
- The light rail extension with a Hayden Island station
- Safe walkways, signalized crosswalks, protected bike lanes and multi-purpose pathways
- Attractive retaining walls, sound walls, and landscaping for ODOT Right of Way and local streets per the Hayden Island Plan.

N-003-019

The Island Community expects support from the City, TriMet and others to promote new mixed-use development around the new light rail station consistent with the Hayden Island Plan.

N-003-020

HiNooN and HILP expect a park-and-ride facility on the island for seniors and handicapped residents in light of the lack of local bus service on the island and the planned termination of park-and-ride service at the Expo Center. Alternatively, an east west shuttle bus service on the island could move residents to and from the transit station.

Page 3 of 4

The project has endeavored to avoid the displacement of businesses, though it is not possible to do so within the densely developed corridor. The project will continue to look for ways in which impacts can be minimized and avoided.

The displacement of Safeway is documented in the FEIS. Compensation for this impact is governed by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. The project will suggest that Safeway relocate on Hayden Island, but cannot require them to relocate in any specific location. The eventual relocation will be a business decision by Safeway.

The possibility of early construction of the local multimodal bridge will continue to be a consideration by the project as project sequencing is refined. It is also discussed in Chapter 2 of the FEIS, (Section 2.3.1), but not as mitigation. Although it is not appropriate to describe the early construction as mitigation, it is discussed as something we will explore as we further refine construction staging. Specifically Section 2.3.1 of the FEIS states:

> Similarly, the Marine Drive interchange construction would need to be coordinated with construction of the southbound lanes coming from Vancouver. While this interchange can be constructed independently from the work described above, the completion and utilization of the ramp system between Hayden Island and Marine Drive requires the work to occur in the same period. Early construction of the local multimodal bridge between Marine Drive and Hayden Island, so that it can be used as an alternate access route during the remaining construction period, will be analyzed during final design. The interchange reconstruction also needs to occur so that Marine Drive can be elevated, allowing the light rail extension to cross under Marine Drive. The Marine Drive

N-003-021 The Island Community expects the east of I-5 neighborhood retail zone in the Hayden Island Concept Plan to be reconciled with the CRC proposal for storm water facilities in the same location. The planned storm water treatment wetlands will take many acres of land planned for other uses. Fenced contaminated treatment wetlands are not appropriate in an urban environment.

The Hayden Island Plan calls for a significant "Gateway Park" on the Columbia River as a post-construction re-use of the of Thunderbird Hotel site and the vacant area under the existing and new bridges. Also, the Plan calls for a public water access park on the north shore of North Portland Harbor at the I-5 crossing.

A multi-use path on the east side of I-5 from Marine Drive to the CR Bridge.

Additional Post Construction Hayden Island Needs

N-003-022 Community Center. Staff the Center with help for seniors and vulnerable residents of the island.

N-003-023 An enhanced security system with coordination of City, TriMet, State, local security forces; coordination of local business hours with TriMet operating hours; landscape maintenance, lighting and other measures to control transients.

Floating Home Specific Needs (Jantzen Beach Moorage)

N-003-024 New floating home moorage to permanently relocate displaced floating homes and to temporarily locate those moved out for the construction stage.

Parking structure to replace parking lots taken.

Relocate remainder of Jantzen Avenue further north to allow Jantzen Beach moorage to keep the private road for additional parking and other needs.

All existing and new utility lines crossing Jantzen Beach Moorage to be buried underground.

Page 4 of 4

interchange is expected to take a little more than 3 years to construct, including work at the Victory Boulevard interchange.

N-003-009

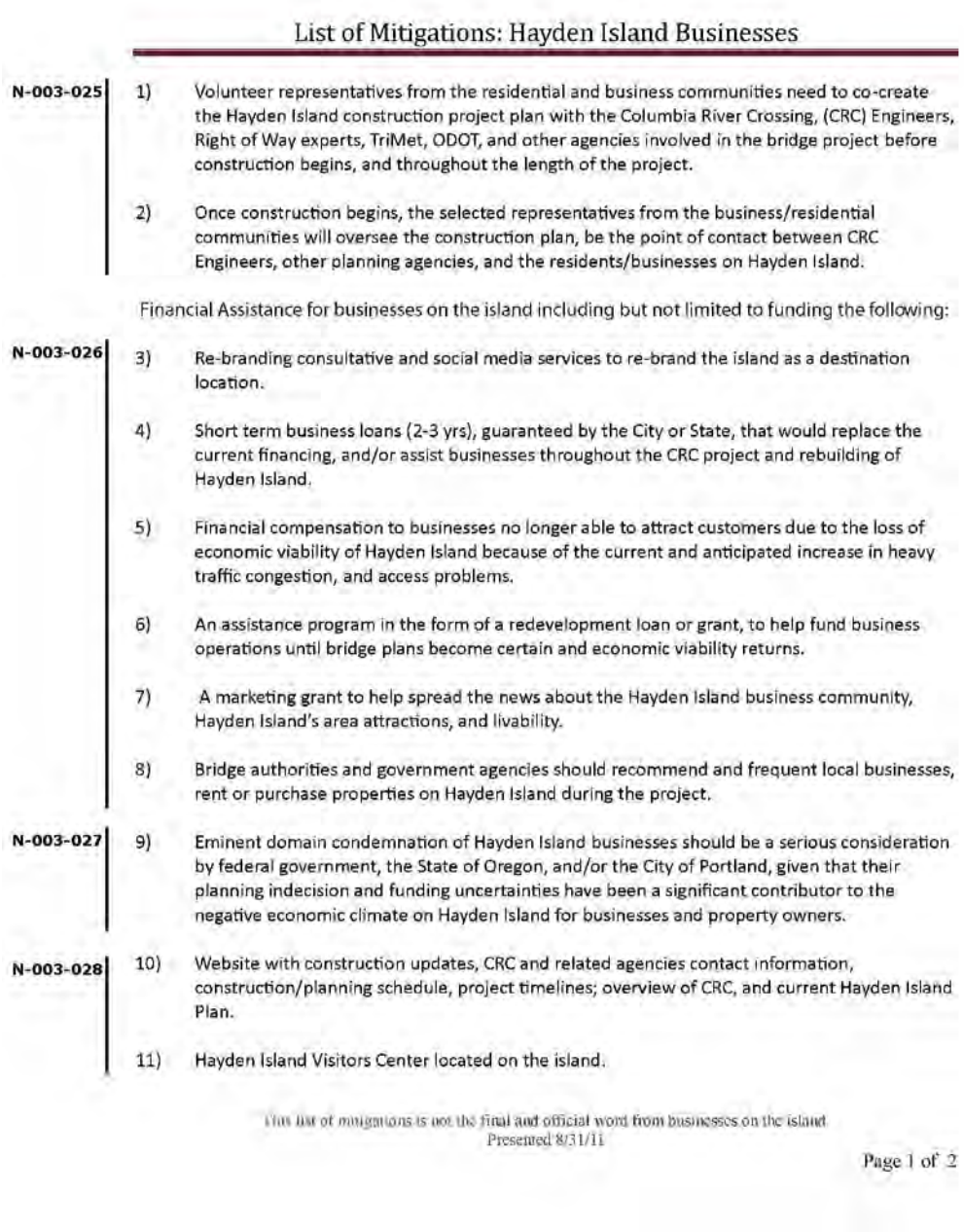
Please see response N-003-006.

N-003-010

The project's focus will be on preventing and minimizing the impacts at the source. There is a list of proposed measures below. But the project will also work closely with the community and will want to know of individuals and households with unique circumstances who may be differently impacted than their neighbors. As construction plans are advanced, we will be sharing details with the neighborhood association and with businesses on the island.

The project has committed to the following mitigation measures as described on pages 3-283 to 3-285 of the FEIS:

- Control dust and exhaust emissions from demolition and construction activities.
- Require contractors to comply with State of Oregon standard specifications (Section 290) for dust, diesel vehicles, and burning activities.
- Follow State of Oregon's specifications for truck staging areas for diesel-powered vehicles.
- Use ultra low sulfur diesel for diesel construction vehicles and equipment, or otherwise comply with any new, more stringent regulations in place at the time of construction.
- Pursue emerging technologies for cleaner construction emissions, like the use of diesel scrubbers for compatible equipment, and continue to encourage and require those types of technologies as bidding laws allow.
- Require stationary sources, such as concrete mix and asphalt



List of Mitigations: Hayden Island Businesses

N-003-025

1) Volunteer representatives from the residential and business communities need to co-create the Hayden Island construction project plan with the Columbia River Crossing, (CRC) Engineers, Right of Way experts, TriMet, ODOT, and other agencies involved in the bridge project before construction begins, and throughout the length of the project.

2) Once construction begins, the selected representatives from the business/residential communities will oversee the construction plan, be the point of contact between CRC Engineers, other planning agencies, and the residents/businesses on Hayden Island.

Financial Assistance for businesses on the island including but not limited to funding the following:

N-003-026

3) Re-branding consultative and social media services to re-brand the island as a destination location.

4) Short term business loans (2-3 yrs), guaranteed by the City or State, that would replace the current financing, and/or assist businesses throughout the CRC project and rebuilding of Hayden Island.

5) Financial compensation to businesses no longer able to attract customers due to the loss of economic viability of Hayden Island because of the current and anticipated increase in heavy traffic congestion, and access problems.

6) An assistance program in the form of a redevelopment loan or grant, to help fund business operations until bridge plans become certain and economic viability returns.

7) A marketing grant to help spread the news about the Hayden Island business community, Hayden Island's area attractions, and livability.

8) Bridge authorities and government agencies should recommend and frequent local businesses, rent or purchase properties on Hayden Island during the project.

N-003-027

9) Eminent domain condemnation of Hayden Island businesses should be a serious consideration by federal government, the State of Oregon, and/or the City of Portland, given that their planning indecision and funding uncertainties have been a significant contributor to the negative economic climate on Hayden Island for businesses and property owners.

N-003-028

10) Website with construction updates, CRC and related agencies contact information, construction/planning schedule, project timelines; overview of CRC, and current Hayden Island Plan.

11) Hayden Island Visitors Center located on the island.

This list of mitigations is not the final and official word from businesses on the island
Presented 8/31/11

Page 1 of 2

plants, to obtain an Air Contaminant Discharge Permit from either DEQ or SWCAA and to comply with regulations for controlling dust and other pollutant emissions.

- Manage construction materials and activities to minimize dust, glare and smoke.

N-003-011

In an effort to reduce the potential for inappropriate use of vacated property, the CRC project may install fencing and signage to minimize the potential for trespassing. These methods will be detailed by the DOT in the construction staging plan, which will be executed by the contractor.

Should these vacated properties become an attractive nuisance, the CRC project could shorten timelines for demolition, or contract with a firm to provide part-time or full-time security. The CRC project team will work with neighborhoods likely affected by project staging to identify a plan that best meets the needs of nearby residents, business owners, and the contractor.

N-003-012

Thank you for your comment. The project will work closely with you, Island residents, organizations, and businesses.

N-003-013

Regarding the potential for inappropriate use of vacated property, please see N-003-011.

The project is working on a construction-period transit plan. Tentatively, these plans include a shuttle service. But how this will aid Island residents will be further developed, and will be discussed with the community as one of many ways to provide mobility on the Island.

List of Mitigations: Hayden Island Businesses

N-003-028	12)	A hotline for people to call about CRC construction, theft, vandalism, an accident, or if there is a problem associated with the construction.
	13)	Financial Assistance to attract new businesses to Hayden Island before and during construction.
N-003-029	14)	Early construction of the Hayden Island local arterial bridge to ease traffic bottlenecks on/off the island during construction.
	15)	Create reliable transportation during the construction.
	16)	Ensure traffic can enter and exit the island with ease.
N-003-030	17)	Enhanced security services for vacant residential and business properties. More police presence on the West & East sides of Hayden Island.
	18)	A satellite police station needs to be placed in a visible location on Hayden Island with routine daily and nightly island patrols!
N-003-031	19)	Home and business inspections before and after construction for any possible damages caused by construction vibrations especially for those that are closer to the staging areas and river.
N-003-032	20)	Additional streetlights need to be added to ensure safety at night for pedestrians and motorists. Especially on the newly created "main street" of town.
N-003-033	21)	City/State/Federal Government need to supply a large billboard alerting drivers on I-5 South and I-5 North that "Businesses Are Open." Also, small signs strategically located throughout Hayden Island and on the West and East sides of the Island for pedestrians, bike riders and slow moving motorists.
N-003-034	22)	The Island Community made up of residents and businesses expects support from the City, State, Federal Government, Portland Development Commission; Metro, Business Oregon, Venture Portland, TriMet, and other governing agencies to financially assist in ways to attract more business to the island.

This list of mitigations is not the final and official word from businesses on the island.
Presented 8/31/11

Page 2 of 2

As discussed in the response to N-003-008, the CRC project is working to minimize temporary impacts during construction that could impede travel in the project area.

N-003-014

Potential noise and vibration impacts that would result from the CRC project were disclosed in Chapter 3 (Section 3.11) of the DEIS, and have been updated in Chapter 3 (Section 3.11) of the FEIS. As described in the DEIS and FEIS, the FTA has also developed impact criteria for acceptable levels of ground-borne vibration. Light rail operations could result in some vibration impacts along 17th Street and Washington Street, all of which could be mitigated by installing vibration isolation between the rails and ground. This has also been updated for the FEIS in Chapter 3 (Section 3.11). No expected vibration-related impacts have been identified on Hayden Island. However, as the approach to construction is finalized, the project will assess the potential for vibration resulting from the staging area activities and construction. If the project identifies any potential for vibration-related impacts, it will work with property owners to minimize such and develop adequate documentation to evaluate such. Before-and-after assessments of building foundations and walls is often part of this evaluation.

N-003-015

Please see the response to N-003-010.

N-003-016

The project has committed to the design and construction of a temporary noise barrier on the far western edge of the Thunderbird Staging Area. The project will work to direct, reduce, and baffle (shield) construction lights which would adversely impact the nearby residents.

The FEIS contains a summary of the information obtained during

preparation of the Hazardous Materials Technical Report. The technical report does have some specific information and research regarding potential contaminants for identified sites. However, it is only for sites identified in regulatory databases, not every property within the corridor. The scope of an environmental impact statement in a large corridor does not include specific on-site investigation of hazardous materials on every single property; it generally looks at summary information for the entire corridor (i.e. regulatory database, aerial photos, Sanborn maps, and windshield survey) to provide an overview of potential issues and how that could impact the various alternatives.

The project will investigate and appropriately handle contaminants found at all properties permanently or temporarily acquired.

N-003-017

Construction activities associated with transit and highway improvements have the potential to negatively and positively affect nearby businesses, as described in Chapter 3 (Section 3.4) of the DEIS and the FEIS. For example, construction could temporarily block visibility and access to specific businesses, cause traffic delays, and reroute traffic to detours, all of which could divert customers and hamper business activities. Potential positive construction effects could include increased spending in the project area during construction, which can, for example, increase sales at local shops and restaurants.

The project team will work to minimize negative business impacts and encourage positive impacts. Construction will be carefully planned to minimize road closures and to avoid completely closing access to businesses. When needed, signs would be used to identify temporary access points and the businesses they serve. Detours would be carefully routed to reduce travel times and be signed to reduce confusion. Programs to help businesses affected during construction could include business planning assistance, marketing and retail consulting, or

promotions to generate patronage in construction areas. See Chapter 3 (Section 3.4) of the FEIS for more discussion on temporary construction effects and possible mitigation measures.

N-003-018

These elements are all incorporated into the design of the Locally Preferred Alternative.

N-003-019

As described in Chapter 3 (Section 3.4) of the DEIS and FEIS, and in the Indirect Effects Technical Report, the CRC project will reinforce the region’s goals of concentrating development in regional centers, reinforcing existing corridors, and promoting transit and pedestrian friendly development and development patterns. The project will coordinate with the City of Portland, although specific zoning changes or incentives for transit oriented development are primarily the City's responsibility. However, the multi-million dollar investment provided by the project has been shown to positively contribute to such development.

N-003-020

On-street parking is shown in the current roadway designs for Tomahawk Island Drive. The project will work with the City of Portland and the Hayden Island community to refine the parking designations near the LRT station. There will be consideration of accommodating a small area as a "kiss and ride" for residents to be safely dropped off near the station. Delta Park will serve as the nearest park and ride to the Hayden Island light rail station, a distance of 1.17 miles from the Hayden Island light rail station. The distance between the park and ride lots at Expo Center and Delta Park is 0.69 miles.

N-003-021

Regarding stormwater facilities, please see the response to N-003-003.

The project has no impact to public parks on Hayden Island and therefore has no need for such mitigation. The CRC project does not currently propose to convert the existing Thunderbird site on Hayden Island into a public park, but it also does not preclude it from becoming a public park in the future. Decisions regarding the disposal of surplus property after project construction will be made at a later date. The eastside multi-use path is part of the LPA.

N-003-022

Though the Island may benefit from a new Community Center, it is not the project's role to provide one. The project is providing millions of dollars of improvement for the Island. These investments will be part of the set of incentives that will help drive redevelopment of the commercial areas and will contribute to the vibrancy of Island neighborhoods.

N-003-023

Regarding the potential for inappropriate use of vacated property, please see the response to N-003-011.

N-003-024

As the project designs progress, there will be more details made available about utility relocations and the specific for Jantzen Avenue. The project is committed to mitigating any impacts to JBMI and is well aware of the needs for infrastructure improvements and post-construction restorations.

Regarding floating home displacements, please see the response to N-003-006.

N-003-025

The project will work closely with both the residents and business owners on the island as construction plans are advanced.

N-003-026

Regarding the potential for the project to negatively and positively affect nearby businesses, please see N-003-017.

N-003-027

The DEIS disclosed all known property acquisitions required to construct the project alternatives. These acquisitions were summarized in the DEIS in Chapter 3 (Section 3.3) and were listed in full in Appendix D of the DEIS. The information associated with each property, such as an address, was pulled directly from the Clark and Multnomah County tax assessors' databases, and therefore was only as up-to-date as that County's information.

Property owners will receive just compensation for the estimated value of land and improvements acquired and for other impacts that result in a measurable loss of value to the remaining property. Following the publication of the FEIS, property owners will be notified of impacts to their property and acquisition negotiations will begin. The acquisition and relocation process will follow The Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970 (as amended). The process by which acquisitions will occur is described in the Real Property Acquisition and Relocation Plan and summarized in Chapter 3 (Section 3.3) of the FEIS.

N-003-028

Regarding the potential for the project to negatively and positively affect nearby businesses, please see the response to N-003-017.

The project will similarly work to reduce the potential for crime during construction, using lighting, security, and other means.

The project does not have any plans to construct a Visitor Center for the Island. The construction of such a facility is not part of the project's purpose and need. Nor would it represent mitigation for any identified impact to the Island.

N-003-029

The project is eager to work with emergency service and utility providers as the design for the LPA and the approach to construction is further refined. The project has already made commitments to maintaining three through lanes, and to construction-period transit enhancements.

Regarding the possibility of early construction of the local multimodal bridge, please see the response to N-003-008.

N-003-030

Regarding the potential for inappropriate use of vacated property, please see the response to N-003-011.

N-003-031

Section 5.2.2 and Section 6.3.2 of the Noise and Vibration Technical Report discuss construction vibration. Although there are no state or federal regulations related to construction vibration, the contract specification will have a section that would likely limit the contractor to a maximum vibration level. The majority of major vibration-producing activities will be more than 300 feet from the nearest homes at the Hayden Island Manufactured Home Community. Therefore, it is unlikely that vibration levels at that distance will be of sufficient magnitude to result in any structural issues, including structural issues for the manufactured homes.

N-003-032

The project will work closely with the community on the design issues for Tomahawk Drive and the light rail station. Especially in areas where pedestrians will pass under structures, there will be a focus on safety and high quality design. The project's designers have been trained in Crime Prevention Through Environmental Design (CPTED), and will work to provide safe environments under the new facilities and elsewhere.

N-003-033

There are regulations which govern the placement of billboards and other signage. Within these limits, the project will look for ways to encourage commercial activity on the Island during construction. The project has staff that have specific training in this area and have been successful at retaining businesses during past construction projects in Portland. There will be a program developed, which is now outlined in Section 3.4 of the FEIS. The program will provide details regarding business retention investments, mobility programs, pedestrian routing and safety, and much more.

N-003-034

The project will provide a high capacity transit station as well as a safe interchange which will function better than the existing interchange does. These investments will have a beneficial effect on the local economy, though the associated displacements will result in an adverse effect. In addition to providing millions of dollars in improvements, the project will also work with businesses during construction to minimize impacts to businesses and business closures. Parties that are not sponsors of the project have no similar obligation. However, the CRC project will coordinate and collaborate with any other entities working to preserve and cultivate businesses on the Island.

Portland's Directly Impacted Neighborhoods

Official Comments on the Final Environmental Impact Statement for the

Columbia River Crossing

October 24, 2011

Victor M. Mendez
Administrator
Federal Highway Administration

Peter M Rogoff
Administrator
Federal Transit Administrator

RECEIVED
OCT 2 4 2011
Columbia River Crossing

c/o Heather Wills
Columbia River Crossing
700 Washington Street, Suite 300
Vancouver, Washington 98660

N-004-001 We, the neighborhoods of Portland directly impacted by the Columbia River Crossing Project, support the Locally Preferred Alternative Option A provided the project honors its commitments and continues to work openly with the community as we move forward with final design.

Though we are happy to have reached this important milestone in the development of this complex transportation system for the part of Portland where we live, work, shop and play, there are still many outstanding concerns that need continued good faith work.

The design needs to respect the work of The Hayden Island Plan. The Island could lose 39 local service businesses including its only grocery store and only gas station. 643 people will lose their jobs on the Island; many of those people live in our community. Where are the over a thousand households going to shop for basics now? We need to make sure those real impacts are recognized and that the Island still has a neighborhood center while the project is being built and after the system is opened.

We have consistently supported the construction of a new bridge, but it must be built right - all the way down to the details. Our communities bear the consequences of this project during construction and afterwards. It is important that this project enhances not only the region's transportation network but also enhances the community upon which it is built.

This set of documents is submitted to be part of the FEIS record to memorialize the community understandings and concerns. We want to work even more closely with the CRC project team to together complete a livable design for the Columbia River Crossing.

Sincerely

Hayden Island Neighborhood Bridgeton Neighborhood East Columbia Neighborhood

N-004-001

Each of the attached comments have been considered and responded to. The project looks forward to ongoing coordination and collaboration with Portland neighborhoods and organizations. As the design progresses, and plans for construction are further developed, the project will continue to keep the community informed, participate in problem solving with local citizens, and seek ways to avoid and minimize impacts.

Portland's Directly Impacted Neighborhoods
Comments on the Final Environmental Impact Statement for the Columbia River Crossing

List of Public Comments:

N-004-001

- **Neighborhoods Impacts Overview** Letter
- **Hayden Island Neighborhood** (HiNoon) Letter
- **Bridgeton Neighborhood Association** Letter + 34 Signatures of Neighbors
- **East Columbia Neighborhood Association** Letter
- **Hayden Island Livability Project** (HILP) Letter
- **Hayden island Manufactured Home Community** Letter + 50 Signatures of Neighbors
- **Victor Viets** Letter - List of Hayden Island Issues
- **Brad Howton** Letter - FEIS and the Hayden Island Plan
- **Leslie Sawyer** Letter
- **Tom Dana** Letter
- **Metro Regional Government** Attachment to Land Use Approval - FEIS and post EIS Metro Questions and CRC Responses
- **Urban Design Advisory Group** White Paper comments Build a Better Bridge Faster

EAST COLUMBIA NEIGHBORHOOD ASSOCIATION

Heather Wills
CRC Environmental Manager
700 Washington Street, Suite 300
Vancouver, WA 98660

Dear Ms. Wills,

N-005-001 East Columbia Neighborhood supports the building of a new I-5 bridge, and commits to be a working partner with the CRC project to preserve the quality of life that is so precious to residents of Hayden Island, Bridgeton and East Columbia. The unique characteristics of these neighborhoods is a valuable asset to the residents as well as to the surrounding areas. The East Columbia neighborhood has concerns in several areas. These concerns are outlined below.

Prior commitments that need to be upheld

N-005-002 East Columbia supports the Arterial Bridge from Marine Dr. to Hayden Island and the eastside multiple use path but we are concerned they are now referred to as "options". It has been a neighborhood belief that these were components of the bridge project and not options. Both the IPS and Project Sponsors voted unanimously to include these features in the CRC project. These components are vital to the CRC project and should remain as commitments to the neighborhoods that will depend on them for viable transportation options and connectivity to Hayden Island. The Arterial Bridge will provide accessibility on a variety of levels. Of utmost concern is the accessibility it will provide Portland Firehouse Station #17, which provides fire protection service to Bridgeton and East Columbia neighborhoods.

Incorrect data used for impact statements and assumptions

N-005-003 The FEIS states it is using 2000 Census data and uses a population of 344 for East Columbia. The 2000 Census Bureau data, Summary File 3 states a population of 1,490. Census Bureau information is easily available from ESRI. The City of Portland has this information from both the 2000 Census and the Census Bureau 2010 Redistricting Data (P.L. 94-174). The CRC should update its census data, and the more current and accurate data utilized. As stated in the FEIS, the neighborhood boundaries expanded in November 2008, resulting in the current population being 1,748 according to the US Census Bureau data. Areas encompassed since November 2008 include Delta Wood and Fox Run Mobile Home Park – both with a high percentage of low income individuals, and a racially diverse population. These current income and race demographics are also available from ESRI and the City of Portland. There can be no fair or accurate evaluation of impact or demographic description if incorrect and outdated data is used for measurement and evaluation.
The CRC assessment of the Area of Potential Impact is incorrect and flawed for East Columbia. These evaluations should reflect the current population, as well as correct data and comparative numbers in terms of describing impact. If the FEIS is to identify impact and the effects of the CRC project on neighborhoods, then factual data should be used to determine those affects.

In the Appendices on Neighborhood Profiles, it is stated that no crime data exists for East Columbia. Since November 2008, the neighborhood has regularly received crime statistics from the N/NE Portland Police Bureau, Community Policing Officers and ONI Crime Prevention Coordinators. This information is readily available from any of those resources and should be incorporated into the descriptive analyses.

The FEIS states there is no neighborhood plan for East Columbia.
In 1990 East Columbia was the first neighborhood in the city to create and have a Natural Resource Management Plan adopted by City Council. This NRMP has been used in recent land use hearings (2009, 2010), Bureau of Planning reports and as guidance for development in East Columbia. It is available on the City of Portland website. It offers guidance for the development and management of the unique natural resources in East Columbia, as well as environmental stewardship. It should be considered and detailed in the FEIS.

The FEIS lists Community/Neighborhood Resources for East Columbia as only an off leash dog park, East Delta Park and Portland Meadows (all of which were added in the boundary expansion of 2008). The Columbia Children's Arboretum, part of the Portland Parks Bureau, is located in East Columbia and its western boundary is NE 6th which will see impacts from the realignment of the Vancouver Way interchange. Access to the park will be impacted by increased traffic on NE

N-005-001

Thank you for your comment. Each of your specific issues will be addressed below.

N-005-002

Option A, with the arterial crossing, is the design which will be selected in the Record of Decision.

N-005-003

The demographic data provided in the Technical Reports are specific to the portion of the neighborhood that was within the study area. Project staff were able to better assess each neighborhood by focusing on the portion of that neighborhood which would potentially be directly impacted. That is why the population figures do not match with the total population data for each neighborhood.

Though the NRMP is a beneficial plan to have completed, and will be used to guide the minimization of impacts and development of environmental mitigation, it is not specifically a neighborhood plan.

Thank you for alerting us to the availability of crime data for the neighborhood. The advancement of the LPA's design is not likely to change regardless of the specifics of the reported crimes.

N-005-003 6th. The Columbia Children's Arboretum was created in the early 1970s and is the geographical and social heart of East Columbia. The Arboretum is classified as a nature park by PPB and one of only two Arboretums in the City. Additionally East Columbia is home to the Columbia Community Church, which is the monthly meeting place of the neighborhood, as well as holding Sunday services for many in the neighborhood, including Bridgeton residents. These Neighborhood Resources should be listed in the documentation regarding East Columbia.

Community Enhancement Funds

N-005-004 Over the course of the CRC discussions with neighborhoods, a Community Enhancement Fund has been discussed in various formats. This Community Enhancement Fund should be a vital piece of the CRC project and not an option. In order to best assess the impacts of all aspects of the CRC project to neighborhoods, the CRC must use reliable, factual data to determine the demographics of, and level of impact to, neighborhoods most closely aligned with the project. These demographics will inform the environmental justice impacts to neighborhoods. Levels of impact will vary with neighborhoods and project timelines.

In order to accurately determine the impacts of the CRC project the FEIS should contain data that reliably and accurately describes the neighborhoods, and in the case of East Columbia it does not.

Traffic Management/ NE 6th Intersection

N-005-005 There should be careful consideration taken in the redesign of the Vancouver Way and Marine Dr interchange which will have the direct impact of increased traffic on NE 6th Ave.
The intersection of NE 6th, NE Faloma and NE Marine Dr. is currently classified by PBOT as a level D/F intersection. There should be careful consideration, and a redesign of this intersection as a result of the impact of increased traffic on an intersection located within a school zone and classified at a dangerous level. NE 6th is used for TriMet line #8, which draws passengers from East Columbia and Bridgeton. NE 6th does not have sidewalks, so pedestrian safety is an issue. The FEIS should include a traffic management plan for the impacts created by this redesign.

Tree Canopy removal

N-005-006 East Columbia encourages a thorough evaluation of the effects of the planned removal of old growth oak trees along Martin Luther King Blvd, near the Jubitz Truck location. We encourage the CRC project to pursue alternative choices for any tree removal. This area was formerly part of Vanport and is in a managed flood plain, as is all of East Columbia neighborhood. Removal of tree canopy, and especially the number of large trees planned for removal, will adversely affect stormwater runoff in the area. Mention of "tree replacement" should be clearly defined and perhaps the removal of the large trees re-evaluated. There should be a study done to determine how much water will have to be diverted if there is a significant tree removal and how mitigation for this increased stormwater runoff will be handled. These trees not only provide a benefit by diverting stormwater, they provide natural habitat for birds and provide an aesthetically pleasing barrier to the industrial acreage to the east, as well as a shield for areas of East Delta Park to the west.

Noise Study Concerns

N-005-007 The FEIS assumptions on noise do not include overall noise impacts nor do they accurately reflect impacts on surrounding neighborhoods. The FEIS assumptions regarding the proximity of noise impacts are not accurate, as noise can impact a wide ranging area, well beyond the limited scope presented in the FEIS.
East Columbia is directly affected by noise levels from PDX. The western end of both parallel runways are approximately 4,500 ft from the eastern boundary of East Columbia. The level of airport noise is prevalent in our neighborhood, decreasing and increasing depending on wind direction. There appears to be no mention of weather effects for the noise levels created by highway traffic or light rail, or for construction noise. Currently noise from I-5 can be heard in Bridgeton and East Columbia. Noise from PIR can be heard miles in any direction, depending on weather. There should be an in-depth study done on the breadth of noise impacts on surrounding communities already affected by multiple noise producers. Considerations should be taken for weather, duration, and the overall impact that will result in the additional highway traffic noise as well as the limited duration construction noise. Mitigation for these noise impacts, or possible abatement protocols, should be developed. Noise impacts from this project cannot be singularly considered but must be considered as adding to the overall noise impact of the area.

N-005-008 We hope the CRC will provide a commitment to the community to work openly and transparently on the impacts to neighborhoods. We hope the incorrect data contained in the FEIS can be corrected which will then more accurately reflect the neighborhood demographics resulting in a more reliable projection of impacts to surrounding neighborhoods.

Respectfully,

Marylelen Kincaid
East Columbia Board, Land Use Chair

Sarah Whitefield
East Columbia Board, Chair

N-005-004

In the last three years the CRC project team, the Project Sponsors Council, and CRC advisory groups have focused on incorporating a wide range of community enhancements into the project. The project has looked for ways to leverage the highway and transit investments into additional improvements for project neighbors and local communities. These improvements are beyond the benefits identified as the project's purpose and need. These tangible improvements include new local roads and improved local flow and connections for Hayden Island residents; better bike and pedestrian access to the improved facilities; new bike and pedestrian trails; and a separate bridge for local auto access from North Portland to Hayden Island.

The CRC remains committed to aggressively maximizing and leveraging resources to bring additional benefits and improvements to our community. Two options have been identified for further exploration, both include a financial set aside of a specific amount dedicated to a specific purpose. One approach is a project specific community enhancement fund. There is some history with such an approach - the Delta Park 1-5 widening project (2006) and Metro's solid waste program (1991) are two examples. The other approach is a different concept, a regional fund established by the state to benefit the neighborhoods and communities in close proximity to 1-5 and the CRC project. Both approaches have been successfully implemented in the Portland region and will help inform this effort. We need to be clear about both of these approaches - neither will be easy. Both approaches have limitations and legal restrictions associated with anticipated funding sources. Both will require legislative support. Both will likely need enabling legislation and both will require funding.

N-005-005

The project proposes a major redesign of the Marine Drive interchange. The redesign is intended to improve operational efficiency and safety.

On the east side of I-5, Martin L. King, Jr. Boulevard will become the principal road connecting with the interchange. Alternative routing using a new connection in the vicinity of East Delta Park will allow traffic from N. Marine Drive to connect with the reconfigured interchange. A description of the project's proposed changes for the interchange can be found beginning on page 2-13 of the DEIS.

The entirety of NE 6th Avenue is outside the study area of the project. In the City of Portland's Transportation System Plan, NE 6th Avenue is designated as a local service street, a community transit street, a city walkway for a portion, a local service walkway for a portion, and a local service bikeway. Improvements to NE 6th Avenue and to the identified intersections are best addressed by working with the City of Portland.

N-005-006

The LPA shows that several large oak trees and potentially other tree species will likely be removed as part of the Marine Drive Interchange Realignment. The CRC project is committed to minimizing environmental effects of the project. Should those trees need to be removed, compensation in the form of revegetation to City of Portland standards will likely be required. The CRC project recognizes the importance of tree canopy and vegetation in capturing and releasing rainfall. Stormwater treatment systems are proposed that will address stormwater quality and quantity in the Columbia Slough drainage area. Because the number and area of the trees is relatively small in relation to the overall drainage areas, existing interception of rainfall is likely minimal. With the planting of new trees, effects to rainfall interception and aesthetic issues will be limited.

N-005-007

Potential noise and vibration impacts that would result from the CRC project were disclosed in Chapter 3 (Section 3.11) of the FEIS. A complete detailed noise and vibration analysis can be found in the Noise

and Vibration Technical Report for the Final Environmental Impact Statement on the Project web site under the Final Environmental Impact Statement. For traffic noise on public highways, the FHWA collaborates with the DOTs to set the traffic noise abatement criteria for highway noise, which are then implemented by the state DOTs.

Noise walls, to the extent that they are effective at reducing noise and can be constructed at a reasonable cost, are the most common type of mitigation for highway noise when project-related noise levels exceed the abatement criteria. The FEIS provides recommended locations for eleven new or replacement noise walls that are preliminarily considered reasonable and feasible by state criteria. These eleven noise walls are effective at reducing noise impacts from approximately 270 decibels under the No-Build alternative, to approximately 110 decibels with the Columbia River Crossing Preferred Alternative. All remaining impacts are at locations where noise abatement was simply not effective, either due to topographical conditions, or because the impacts are at upper floors that are difficult to mitigate with noise walls. Information on the noise walls used to mitigate project-related highway noise impacts can be found in the FEIS (Chapter 3 Section 3.11), with detailed information also provided in the Noise and Vibration Technical Report.

Noise and vibration related to the operation of the light rail and bus facilities are evaluated using the criteria in the FTA Guidance Manual for Transit Noise and Vibration Impact Assessment. Based on the analysis performed for the FEIS, light rail operations are predicted to result in several noise impacts, all of which could be mitigated with a combination of noise walls, building sound insulation, and vibration dampeners installed around the rails. More information can be found in the FEIS Chapter 3 (Section 3.11), with detailed information also provided in the Noise and Vibration Technical Report.

In direct response to your concerns about Portland International Airport

(PDX), the Federal Aviation Administration is responsible for noise from airports. There is no direct connection between the noise from the airport and the noise from the highway or light rail. Also, the noise measurements taken as part of the Columbia River Crossing Project do include the noise from all area noise sources, including both airports (PDX and Pearson Airport), commercial activities, residential activities, existing traffic on I-5, local arterial and connector roadways, and any construction activities at the time of the monitoring. Furthermore, the traffic noise study uses traffic volumes, posted speeds, and vehicle mixtures (cars, delivery trucks, and long-haul trucks and dump trucks) that are projected for the year 2030, and therefore any noise abatement measures are designed to be effective for 20 years.

Atmospheric conditions that can affect the transmission of noise include wind, temperature, humidity, and precipitation. Wind can increase sound levels if it is blowing from the noise source to the receiver; conversely, it can reduce noise levels if blowing in the opposite direction. Noise propagation can also be affected when the temperature gradient is such that an inversion is formed. Other atmospheric conditions such as humidity and precipitation are rarely severe enough to result in significant changes in noise level propagation. However, because weather conditions frequently change, it is not realistic to consider atmospheric conditions in traffic noise studies.

Finally, because the noise models were validated with measured noise levels that, as previously stated, did include all area noise sources, and because the analysis uses projected future 2030 operational information, the study provides a cumulative noise assessment of all noise-sensitive properties that could be adversely affected by noise. That is not to discount the fact that there are many residences that can hear noise from the airports, highways, and other local area noise sources, as these noise sources are all part of living in an urban area. Providing a noise study that included all the area noise sources, (which vary constantly)

under all the varying weather conditions, cannot be reasonably performed. Furthermore, the results of the study would likely yield the same general results: provide noise walls for surface transportation noise to reduce noise levels for those most severely affected.

N-005-008

Thank you for your cooperation and comments.

October 24, 2011

Sam Adams
Mayor, City of Portland
1221 SW 4th Avenue, Room 340
Portland, Oregon 97204

Sam,

N-006-001

I submitted these comments to accompany the FEIS transmittal to the FTA and FHWA as part of the package of like documents produced by other concerned Hayden Island community groups and individuals. For the most part, they describe decisions made after publication of the DEIS that could adversely affect the Community's opportunity to see its vision implemented. Although I remain optimistic that future discussions will yield solutions to the issues raised here, I'm concerned that the City's goals in this process as they relate to Hayden Island are losing traction. That 'last chance' for Hayden Island's future we all acknowledged three or four years ago is here, today!

The CRC FEIS and the Hayden Island Plan

N-006-002

The Hayden Island Plan, representing a unified vision for the Hayden Island Community, was developed by Portland Planning with direction from a 30 member Island Steering Committee. It was drawn together over a 2 year period beginning in 2007 that included a 4 day public Charrette, and several open houses. The Plan, and its associated ordinances, was adopted by the Portland City Council in September 2009. It was developed energetically and quickly to inform the CRC planning and design processes, and to provide guidance to local leadership during their participation in these processes.

Island residents have contributed a tremendous volume of thoughtful and constructive participation to these deliberations, and have been generally pleased with the agency's willingness to respond to the Island's insistent appeals to comply with the Plan. With the adoption of the final version of LPA (Option A in the FEIS), the community felt reasonably confident we had received a firm commitment to a planning framework that could accommodate its vision. We are disappointed this commitment has not been maintained.

One of the core design elements in the HI Plan assumes the neighborhoods would enjoy a pedestrian oriented 'Main Street' along Tomahawk Island Drive, to include the Light-Rail Station and an **East-Side Retail Center** on opposite sides of the I-5 corridor. This area, zoned General and Neighborhood Commercial, is expected to be developed with new small-scale retail tenants complementing existing service and restaurant businesses, forming a gathering and shopping hub tied to the west side by TI Drive and the planned loop road. The draft FEIS proscribes this concept by locating isolated and restricted stormwater

N-006-001

Thank you for your comments. CRC project staff will continue to work with stakeholders and the public through the design and construction process.

N-006-002

The stormwater facilities shown in the FEIS will continue to be refined as design work progresses. Under the terms of the biological opinion (BO), the CRC project must treat stormwater runoff using bioretention, bioslopes, infiltration ponds, porous pavement, constructed wetlands, and vegetated and soil amended swales designed for infiltration. Based on the information we have on file, stormwater runoff is currently not treated before being released to North Portland Harbor or the Columbia River.

The Hayden Island Redevelopment Plan states that runoff from local streets will be treated in roadside planters and that CRC stormwater will be managed in a "green, state-of-the-art manner." Although the Hayden Island Plan map did not show the constructed wetlands, these are a "green" concept for stormwater treatment, and have been shown in project designs as early as May 2009. The stormwater treatment proposed in the FEIS does include the "green streets" approach proposed in the Hayden Island Redevelopment Plan to the extent feasible. This approach to stormwater treatment is not suitable for streets located under bridges (where it will be difficult to establish plants) or where streets are at or below the seasonal high groundwater table. We will continue to review the developing design to determine whether additional streets lend themselves to this method of runoff treatment. Regardless, the project still needs to manage runoff from almost 28 acres of impervious area consisting of I-5 pavement across Hayden island, associated ramps, the elevated transit guideway, and structures.

N-006-002 facilities north and south of TI Drive. This would mean a loss of new neighborhood support services, and of a planning element designed to tie the two halves of the island together. This relatively new strategy was brought into the planning mix very recently, and added to the FEIS without consideration for the HI Plan or adequate public discussion. It appears the Island will lose its planned neighborhood retail core for a couple of swamps behind cyclone fences. The community will expect significant mitigation for the loss of this important HI Plan element.

N-006-003 The HI Plan anticipates at least two significant new **Parks**, located on the north and south sides of the island, partially developed under freeway structures, adding to the very minimal 1 Acre of existing public parkland on the Island. Public discussions and planning sessions led us to believe that land in both sites would be reserved for this purpose, anticipating development by the CRC and/or City of Portland. FEIS documents suggest additional isolated and restricted stormwater facilities will be developed on the north side of the Island under the freeway structures, and planned park facilities are no longer indicated for either the northern or southern sites. Again, this change was added to the FEIS without apparent consideration for the HI Plan, and without adequate public discussion. The community will expect significant mitigation for the loss of this important HI Plan element.

N-006-004 These changes appear to have been made at the direction of Oregon's Department of Transportation. They represent often repeated examples of unwillingness on the part of the DOTs' to candidly consider the impact of 'standard' and 'best' practices on the ability of the community to achieve the pedestrian/bicycle oriented, urban waterfront village represented by the Hayden Island Plan. This unwillingness to consider creative accommodations to the Island community's interests was also represented in their reluctance to provide definition to even preliminary IAMP concepts prior to submission of the FEIS. The design of a pedestrian/bicycle/scooter/vehicle **Circulation Strategy** is a key to the long-term success of the village concept. This environmental matter has been seemingly pushed forward to avoid the effort required for inventive design or the difficult conversations that may be necessary in creating an acceptable solution. The design of the loop road and main-street connecting the light-rail station, shopping center, neighborhood commercial district, grocery, banks, and other services essential to a healthy, self-sustaining community must facilitate this circulation rather than discourage it. The FEIS does not adequately consider these issues.

N-006-005 The FEIS document suggests, for the first time, that the project will 'displace' 69 businesses, the result of construction activities or planned structures. The HI Plan describes a largely self-sustaining **Community**, with retail, service, light manufacturing, and other commercial activities providing employment and day-to-day neighborhood services to a diverse population expected to more than double in the next 20 years. The potential loss of up to half of the businesses currently in the community will represent a significant set-back to its future. The project needs to consider this loss and its impact on the HI Plan more carefully, make a concerted effort to retain key businesses, and potentially develop incentives to restore lost services.

N-006-003

Regarding stormwater treatment, please see the response to N-006-002.

The process for the final decisions regarding the disposition of any surplus property is made following the completion of construction. The potential uses of this specific site as a park and its potential to be declared surplus property will be discussed and coordinated with residents, local property owners, and project partners.

The transfer of 0.4 acre of surplus land to the City of Vancouver is mitigation for the project's direct impact on the City's existing Waterfront Park, an existing public park and a Section 4(f) resource. The project has no impact to public parks on Hayden Island and therefore no need for such mitigation. The CRC project does not currently propose to convert the existing Thunderbird site on Hayden Island into a public park, but it also does not preclude it from becoming a public park in the future.

N-006-004

The project has endeavored to develop creative solutions for the island, but must do so within established design parameters related to mobility and safety. The project will greatly improve circulation on the island, widening many sidewalks, adding bike lanes, and completing Tomahawk Island Drive. The project is willing to collaborate on an island circulation study, although this would be more appropriately led by the City of Portland.

N-006-005

The FEIS disclosed all known property acquisitions required to construct the LPA. These acquisitions were summarized in the DEIS in Chapter 3 (Section 3.3) and have been shared at numerous recent meetings on Hayden Island and elsewhere.

Since the publication of the DEIS in May of 2008, and the selection of

N-006-005

For the first time in this Hayden Island Community's history, the Hayden Island Plan has provided a view of the future for its residents. Our general goals for the extensive public process and development of the Plan document were to memorialize over 20 years of conversation about the potential of our community, to take advantage of what might be our last chance to formalize a bold, effective plan for the Island's future, and to provide a framework of urban planning tools that can help us implement that vision. We managed the process with the understanding that the CRC Project provided both an opportunity and challenge. We have broadly participated in the CRC's community planning process with the hope and expectation that we would be allowed to protect and implement the values of the Hayden Island Plan. We do not want to see key elements of our vision trampled.

Thank you,

Brad Howton

Chair – Hayden Island Plan Steering Committee
Member of several CRC work groups, including the Portland Working Group

Copies, via email:
Nancy Boyd
Tina Kotek
Andy Cotugno
Catherine Ciarlo
John Gillam
Barry Manning

the LPA by project partners in July 2008, the CRC project team has been working to minimize the potential property impacts associated with the project's improvements. Though the project team has been working to stay within the existing right-of-way, some property acquisitions will be unavoidable. Property owners will receive just compensation for the estimated value of land and improvements acquired and for other impacts that result in a measurable loss of value to the remaining property.

The future of the Hayden Island Plan and of the island itself will be facilitated by the project. The loss of commercial businesses is regrettable, and the project will continue to try to avoid these displacements. However, the project's multi-million dollar improvements on the island will more than offset these losses. The Hayden Island Plan relies on improved Interstate access and the extension of light rail to the island. The LPA represents the locally preferred alternative to achieve these ends, and has thus been supported by ODOT, TriMet, Metro, and the City of Portland.

Bridgeton
NEIGHBORHOOD ASSOCIATION

October 24, 2011

Federal Highway Department

Federal Transit Agency

Dear Sirs,

N-001-001 The Bridgeton Neighborhood continues to express support for building a new I-5 bridge as quickly as possible. However, we know that our quality of life will be impacted by the construction of the new I-5 bridge. We hope it will improve with the bridge completion. We are reminding you of promises made to the residents of North Portland.

Prior commitments that need to be upheld

The FEIS shows that the Arterial Bridge from Marine Drive to Hayden Island and the East Side Multi-use Path are now options. Our position is that these items promote the safety and well being of the people in the Bridgeton neighborhood as well as those on Hayden Island and East Columbia. Consider that Fire Station #17 is the first responder for emergencies on Hayden Island as well as East Columbia and Bridgeton neighborhoods. Providing a non-freeway access option provides security and safety to the area as well as promoting alternative modes of transportation since walking and biking are popular in North Portland.

N-001-002 If the Arterial Bridge and East Side MOP are not built, access from Marine Drive will use the collector-distributor lanes mixing freeway bound traffic with local access traffic. We have been told that the Arterial Bridge is going to be used if the North Portland Harbor Bridges collapse during an earthquake. Are there any plans to retrofit the North Portland Harbor Bridges if the Arterial Bridge is eliminated?

N-001-003 The CRC has attended many Bridgeton meetings and has always said they want to work with the public to support their needs. We see nothing in this plan that shows a sincere desire to support the need for a bike and pedestrian path along the top of the levee. We would like to see the project support the completion of bike and walk paths including those on the Bridgeton Trail to encourage people to use alternative methods of transportation.

N-001-004 We also see broken promises to the Hayden Island community that affect residents in all of North Portland. We support the Hayden Island Plan which strives to make a viable connected community. Neighborhoods and retail have a symbiotic relationship and location is a key component. The FEIS report shows that most of the businesses in the core of the Island are being removed. Many will be replaced with several wetland marshes because of the CRC Storm Management Plan. Is it possible to move these ponds elsewhere and leave this prime retail property for business development?

Incorrect data used for impact statements and assumptions

N-001-005 The FEIS states that there is a total population for Bridgeton of 39 people. The 2000 census showed a population of 573 and we have added many high density residences since then pushing our population to over 1200 many of whom are over 65. It is true that we have few people with disabilities because the lack of sidewalks

N-001-001

The benefits you have described for Option A are accurate. Option A was the preferred option in the FEIS and is part of the Selected Alternative in the ROD.

N-001-002

Option A is part of the Selected Alternative in the ROD.

There are currently no plans to provide a major seismic retrofit of the existing North Portland Harbor bridge.

N-001-003

The project will complete the pathway connecting the Bridgeton neighborhood to the Marine Drive Trail, west of the project. Please see Section 2.2.3 of the FEIS.

N-001-004

The stormwater facilities shown in the FEIS will continue to be refined as design work progresses. Under the terms of the biological opinion (BO), the CRC project must treat stormwater runoff using bioretention, bioslopes, infiltration ponds, porous pavement, constructed wetlands, and vegetated and soil amended swales designed for infiltration. Based on the information we have on file, stormwater runoff is currently not treated before being released to North Portland Harbor or the Columbia River.

The Hayden Island Redevelopment Plan states that runoff from local streets will be treated in roadside planters and that CRC stormwater will be managed in a “green, state-of-the-art manner.” Although the Hayden Island Plan map did not show the constructed wetlands, these are a “green” concept for stormwater treatment, and have been shown in project designs as early as May 2009. The stormwater treatment

N-001-005 and public transportation make it hard for anyone with a disability to live in our area.

N-001-006 The FEIS lists many buses that serve the Bridgeton Neighborhood. Bridgeton is serviced by one bus which runs only during rush hours. We currently have to walk across a muddy path on private property on the levee or walk on the side of Marine Drive to access the buses and Max as listed in the FEIS. We feel that walking and biking on the side of Marine Drive is dangerous, because cars are frequently parked on the side of the road forcing people to walk on the very busy Marine Drive itself.

These inaccuracies tend to imply that there will be minimal impact to our population. Our population has grown using a very high density housing model. We need to protect our continued access to places of work and stores. Any loss of direct access between the neighborhoods is unacceptable.

Issues that impact Peninsula Drainage District 2

N-001-007 Bridgeton and East Columbia are joined together forming Peninsula Drainage District 2. Bridgeton has already lost many trees to meet the "No trees on Levees" standards of the Army Corp of Engineers. We know firsthand how costly it can be to fight their standards. We have heard that the CRC plans include placing concrete bridge supports into the levee. Having years of experience on levee issues with the Army Corp of Engineers leaves us understanding that this will lead to a difficult, expensive, and time-delaying fight. Our fear is that this sort of issue will cause the construction of the Arterial Bridge to be eliminated or delayed.

N-001-008 We need to save as many of the old growth trees in the area as possible. Removing old growth trees will add to the run off that has to be managed by the drainage districts in addition to adding an industrial blight appearance of the area. Removing trees harms the habitat for everyone.

We encourage you to use your resources

N-001-009 Bridgeton residents are aware of access issues for our neighborhood and ask to be involved in design plans relating to this access to the freeway and to the island. We know that the CRC construction will increase the distance and drive time to the island from Marine Drive. We are currently limited to three streets that enter onto Marine Drive for travel into and out of Bridgeton. The intersections at Anchor Way and Gantenbein are frequently blocked by traffic waiting to circle over, then under and enter I-5 north bound. Encouraging walking and biking to the island is a worthy goal. We would be able to respond

N-001-010 to issues that impact us if we were allowed to work within the process instead of being told what is best for us.

N-001-011 Bridgeton residents are in favor of building a new bridge for I-5 to cross the Columbia. We would like to see an aesthetically pleasing structure which will be viewed as something to visit and admire. For the safety and welfare of all of North Portland, we need the direct access to and from Hayden Island by car, by bicycle and on foot.

Sincerely,

Leslie Sawyer,
Co-Chair Bridgeton Neighborhood Association

proposed in the FEIS does include the "green streets" approach proposed in the Hayden Island Redevelopment Plan to the extent feasible. This approach to stormwater treatment is not suitable for streets located under bridges (where it will be difficult to establish plants) or where streets are at or below the seasonal high groundwater table. In addition, care was taken to ensure that the facilities are located on land that is either currently owned by ODOT or would need to be acquired for CRC construction, independent of stormwater management. The current proposed water quality facilities meet these conditions.

While wetlands are typically permanent bodies of water, they are not stagnant. Water flows through them during frequent rainfall events, producing conditions that are not conducive to mosquito larval development. As stated above, a constructed wetland is one of the BMPs listed by NMFS in its BO as providing the level of treatment necessary to protect endangered species found in the Columbia River. As such, the discharges are considered by the agency to meet its stringent requirements.

We will continue to review the developing design to determine whether additional streets lend themselves to this method of runoff treatment. Regardless, the project still needs to manage runoff from almost 28 acres of impervious area consisting of I-5 pavement across Hayden island, associated ramps, the elevated transit guideway, and structures.

N-001-005

The project will be able to improve the conditions for residents in the Bridgeton Neighborhood. The Bridgeton trail will be connected, with accessible facilities, to the Marine Drive Trail and the river-crossing network.

N-001-006

The project will improve the sidewalks and roadways, such as Marine

Matt Whitney,
Co-Chair Bridgeton Neighborhood Association
(Out of town and not available to sign the report)

Supported by the following board members:

Pat Bartch
Richard Brown
Scott Niessen
Anne Neuenschwander
Debbie Robertson
Elizabeth Sanders
Brian Stipak
Walter Valenta
Chuck Wilson

Way, that connect your neighborhood with the MAX station, bus stops, and the rest of the transportation network.

N-001-007

We have been coordinating with the U.S. Army Corps of Engineers and the Peninsula Drainage District on the impacts to the levee. We are expecting to receive a permit but do not yet know what conditions may be associated with it. The project's intent is to build the local multimodal bridge.

N-001-008

The project will attempt to avoid tree removal as much as possible. This is an appropriate issue for on-going coordination with the community.

N-001-009

The LPA has a fairly recently updated design for North Portland. The Marine Drive, Vancouver Way, Martin Luther King Jr Boulevard, and Union Court configuration provides improvements in safety, access, and intersection operations.

N-001-010

There are numerous opportunities to become or stay involved in the planning and design of the CRC project. Please contact the CRC office directly for more information.

Multiple methods have been used to engage the public so as to address the needs of a wide variety of people in the project decision-making process. Public feedback has helped guide the outreach effort. Examples include workshops with facilitated small-group discussions, open houses where participants can talk one-on-one with staff, public hearings, presentations and discussions at community and neighborhood-sponsored meetings (often at the group’s request), and

advisory group meetings where CRC seeks recommendations from a citizen committee. These events and meetings have taken place at a variety of locations, days of the week, and times of the day to meet the needs of the entire community. For more information on the project's public outreach, please see Appendix B of the FEIS.

N-001-011
Thank you for your comments.

October 24, 2011

Federal Highway Department

Federal Transit Agency

Dear Sirs,

N-002-001

I am the Co-Chair of the Bridgeton Neighborhood and the neighborhood continues to express support for building a new I-5 bridge as quickly as possible. This weekend we held a neighborhood function where over 50 people expressed opinions about the bridge after looking at the chart of the newest plans for Option A.

For years, most of the neighbors have been apathetic about the plans to build a new bridge. They do not think it will happen in their lifetime and they have been disappointed by the proposed added drives to access the freeway by driving south on Vancouver into the heart of all of the truck traffic and then northwest on MLK and Marine Drive. People are actually enthusiastic about the plan to have access to Hayden Island on an Arterial Bridge from Marine Drive. They love the idea of being able to drive, bike or walk to Hayden Island without having to get into freeway and heavy truck traffic. They are optimistic that Hayden Island business will return. They also like the idea of a new more direct way to go to the Kenton area where half of us have our post office.

They also expressed a desire to finally have a bike and pedestrian path from the west end of Bridgeton Road to I-5 and the proposed East Side MOP or the Arterial Bridge. Yes, we would really like to see the completion of the proposed Bridgeton Trail.

Everyone did not like the idea that we would have to drive several extra miles in heavy truck traffic to be able to use the collector-distributor lanes packed with freeway bound traffic in order to drive to Hayden Island if the Arterial Bridge plan is dropped.

I know that we will be impacted for years during this construction, but I am excited about the potential for improved access when the bridge and ramps are completed. I look forward to free flowing traffic on Marine Drive when there are no longer total stops of traffic caused by the opening on the bridge and frequent accidents. It will be great to be able to drive on a free flowing Marine Drive during rush hour instead of getting caught in traffic waiting to cross over I-5, under it and then merge onto it just prior to the Hayden Island merge. This back log of traffic frequently closes access to two of our three roads that connect to Marine Drive.

N-002-002

I hope that officials from the CRC, the state, and the city will continue to work with us to make an aesthetically pleasing bridge that gives us better access to Hayden Island, Portland, and Vancouver.

I am happy to express my support for the construction of a new I-5 bridge and hope that the promise of an Arterial Bridge and the East Side MOP will be retained in the project plan that goes forward to completion.

Sincerely,

Leslie Sawyer,
Co-Chair Bridgeton Neighborhood Association

N-002-001

Aesthetics will be an important consideration during final design and citizen input will be sought.

The Selected Alternative described in the ROD includes the local multi-modal bridge and the multi-use path mentioned in this comment. The project will connect the pedestrian network through the Marine Drive interchange with the western terminus of the Bridgeton Trail.

N-002-002

Please see response to comment N-002-001 above.

October 24, 2011

Ms. Heather Wills
CRC Environmental Manager
700 Washington Street, Suite 300
Vancouver, WA 98660

ECC: Gerald Solomon FHWA HEPE Gerald.solomon@dot.gov
Carl Bausch FTA carl.bausch1111@dot.gov

Dear Ms. Wills,

N-003-001

Hayden Island Neighborhood Association (HINooN) is the City of Portland Oregon recognized neighborhood association representing the 2,200 residents and businesses on Hayden Island. Many of our Board Members have served on multiple committees throughout the development of the CRC project.

HINooN and it's constituents are at "ground zero" of the CRC project with I 5 being the only way to access or to leave our island. The project will divide our community in half. Nonetheless, HINooN is committed to supporting the Columbia River Crossings including the plan designs agreed upon after diligent work by all. We ask for a recommitment from CRC to:

- Follow through with the agreed upon plan designs including the Arterial Bridge,
- The Hayden Island Plan,
- Mitigation
- The Metro Conditions of Approval – Mitigation & Community Enhancement
- Relocate or build a new floating home marina for 31 homes displaced

AGREED UPON PLAN DESIGNS

N-003-002

Considerable time and energy has been expended by all to create plans designs which are workable, admirable and acceptable by all parties. The designs which are missing or greatly reduced include the Light Rail Station (restore agreed designs, add parking facilities for island residents, east west transit bus during construction and after); Stormwater treatment is currently shown in CRC plans for areas designated for Neighborhood Commercial use in the Hayden Island Plan (change to in situ treatment on bridges or pump to Marine Drive treatment area); Parks to be developed on the north and south island sides of the construction area (to be ceded to city, county or state), and the protection of the existing businesses as the start of the Hayden Island Plan retail center.

THE HAYDEN ISLAND PLAN (the "HIP")

N-003-003

The plan was developed with over 20 years of studies and approved by the Portland City Council timed to be available for the CRC planning. It included:

A more walkable residential community that protects the quality of the existing residential neighborhoods of both land-based and floating homes.

N-003-001

Thank you for years of collaboration on this project. Your specific issues are addressed with the following specific responses.

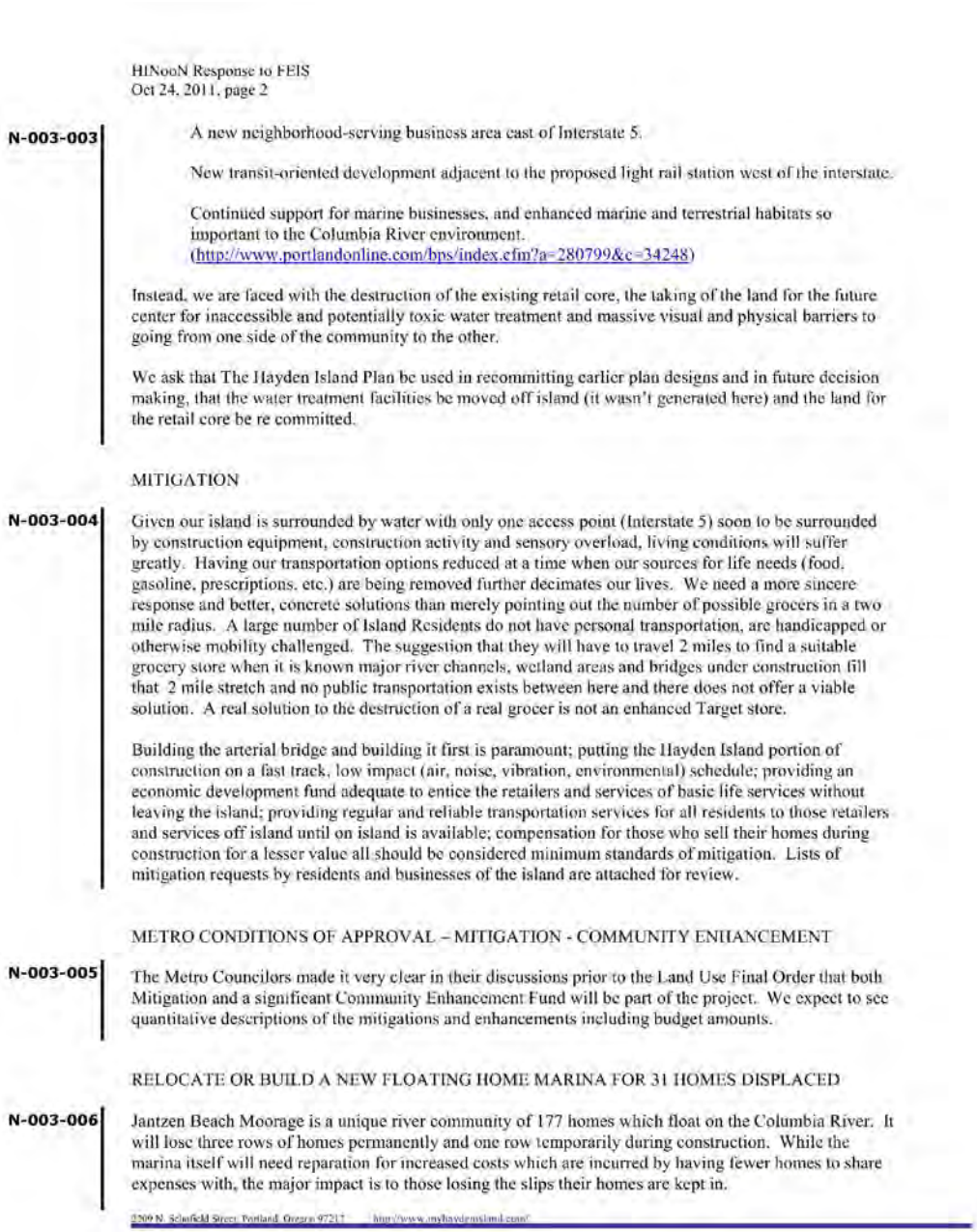
N-003-002

Consistency with each of these plans and prior design decisions is discussed below.

N-003-003

The stormwater facilities shown in the FEIS will continue to be refined as design work progresses. Under the terms of the biological opinion (BO), the CRC project must treat stormwater runoff using bioretention, bioslopes, infiltration ponds, porous pavement, constructed wetlands, and vegetated and soil amended swales designed for infiltration. Based on the information we have on file, stormwater runoff is currently not treated before being released to North Portland Harbor or the Columbia River.

The Hayden Island Redevelopment Plan states that runoff from local streets will be treated in roadside planters and that CRC stormwater will be managed in a "green, state-of-the-art manner." Although the Hayden Island Plan map did not show the constructed wetlands, these are a "green" concept for stormwater treatment, and have been shown in project designs as early as May 2009. The stormwater treatment proposed in the FEIS does include the "green streets" approach proposed in the Hayden Island Redevelopment Plan to the extent feasible. This approach to stormwater treatment is not suitable for streets located under bridges (where it will be difficult to establish plants) or where streets are at or below the seasonal high groundwater table. We will continue to review the developing design to determine whether additional streets lend themselves to this method of runoff treatment. Regardless, the project still needs to manage runoff from almost 28



HINooN Response to FEIS
Oct 24, 2011, page 2

N-003-003

A new neighborhood-serving business area east of Interstate 5.

New transit-oriented development adjacent to the proposed light rail station west of the interstate.

Continued support for marine businesses, and enhanced marine and terrestrial habitats so important to the Columbia River environment.
(http://www.portlandonline.com/bps/index.cfm?a=280799&c=34248)

Instead, we are faced with the destruction of the existing retail core, the taking of the land for the future center for inaccessible and potentially toxic water treatment and massive visual and physical barriers to going from one side of the community to the other.

We ask that The Hayden Island Plan be used in recommitting earlier plan designs and in future decision making, that the water treatment facilities be moved off island (it wasn't generated here) and the land for the retail core be re committed.

MITIGATION

N-003-004

Given our island is surrounded by water with only one access point (Interstate 5) soon to be surrounded by construction equipment, construction activity and sensory overload, living conditions will suffer greatly. Having our transportation options reduced at a time when our sources for life needs (food, gasoline, prescriptions, etc.) are being removed further decimates our lives. We need a more sincere response and better, concrete solutions than merely pointing out the number of possible grocers in a two mile radius. A large number of Island Residents do not have personal transportation, are handicapped or otherwise mobility challenged. The suggestion that they will have to travel 2 miles to find a suitable grocery store when it is known major river channels, wetland areas and bridges under construction fill that 2 mile stretch and no public transportation exists between here and there does not offer a viable solution. A real solution to the destruction of a real grocer is not an enhanced Target store.

Building the arterial bridge and building it first is paramount; putting the Hayden Island portion of construction on a fast track, low impact (air, noise, vibration, environmental) schedule; providing an economic development fund adequate to entice the retailers and services of basic life services without leaving the island; providing regular and reliable transportation services for all residents to those retailers and services off island until on island is available; compensation for those who sell their homes during construction for a lesser value all should be considered minimum standards of mitigation. Lists of mitigation requests by residents and businesses of the island are attached for review.

METRO CONDITIONS OF APPROVAL – MITIGATION - COMMUNITY ENHANCEMENT

N-003-005

The Metro Councilors made it very clear in their discussions prior to the Land Use Final Order that both Mitigation and a significant Community Enhancement Fund will be part of the project. We expect to see quantitative descriptions of the mitigations and enhancements including budget amounts.

RELOCATE OR BUILD A NEW FLOATING HOME MARINA FOR 31 HOMES DISPLACED

N-003-006

Jantzen Beach Moorage is a unique river community of 177 homes which float on the Columbia River. It will lose three rows of homes permanently and one row temporarily during construction. While the marina itself will need reparation for increased costs which are incurred by having fewer homes to share expenses with, the major impact is to those losing the slips their homes are kept in.

2209 N. Schmeer Street, Portland, Oregon 97217 http://www.myhavenisland.com/

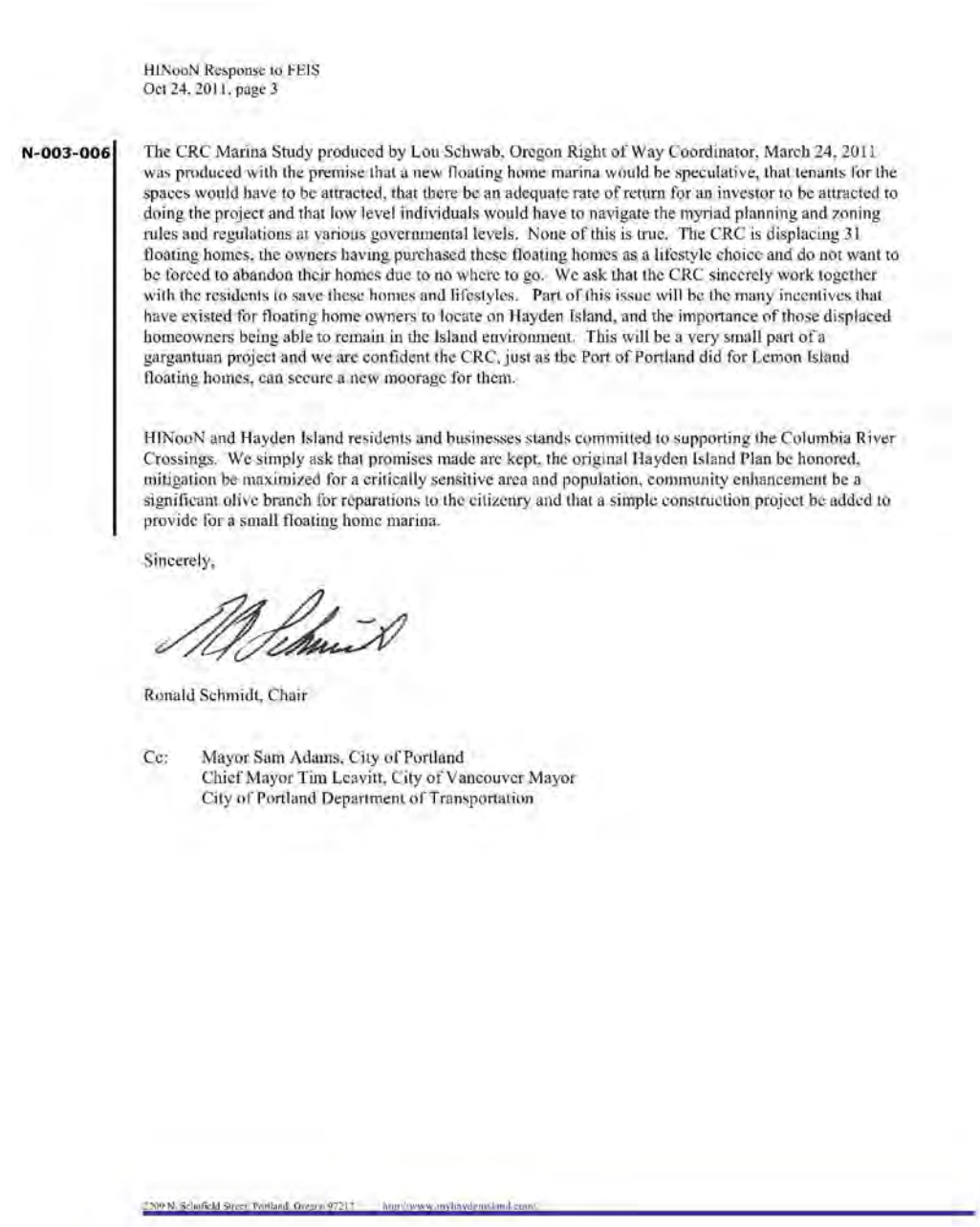
acres of impervious area consisting of I-5 pavement across Hayden island, associated ramps, the elevated transit guideway, and structures.

N-003-004

The project will continue to work with Island residents and organizations on the development of construction-period mitigation plans. The project has already committed to maintaining through-traffic capacity on the Interstate and developing a shuttle-type transit service during construction to assist those who are mobility challenged. And, as explained in the FEIS, there will be robust programs to protect businesses during construction, maintain access and visibility for these businesses, encourage contractors to spend money at these local businesses, etc. The negotiations on specific relocations (both for homes and businesses like the Safeway Store) are somewhat private matters, specific to each property owner. These discussions have recently accelerated and will continue through 2012. As the design is refined, the project will work with many businesses on the island that have been documented as displacements. Some of these businesses may only need changes to their parking lots or small parts of their buildings. Only after the Record of Decision and the further refinement of the designs can these individual negotiations begin in earnest. Part of these negotiations will address property values and the unique circumstance that the real estate market collapse has created. DOT right-of-way professionals are working on mechanisms that will appropriately compensate the displaced homeowners who owe more than their property is worth.

N-003-005

In the last three years the CRC project team, the Project Sponsors Council, and CRC advisory groups have focused on incorporating a wide range of community enhancements into the project. The project has looked for ways to leverage the highway and transit investments into additional improvements for project neighborhoods. These



HINooN Response to FEIS
Oct 24, 2011, page 3

N-003-006

The CRC Marina Study produced by Lou Schwab, Oregon Right of Way Coordinator, March 24, 2011 was produced with the premise that a new floating home marina would be speculative, that tenants for the spaces would have to be attracted, that there be an adequate rate of return for an investor to be attracted to doing the project and that low level individuals would have to navigate the myriad planning and zoning rules and regulations at various governmental levels. None of this is true. The CRC is displacing 31 floating homes, the owners having purchased these floating homes as a lifestyle choice and do not want to be forced to abandon their homes due to no where to go. We ask that the CRC sincerely work together with the residents to save these homes and lifestyles. Part of this issue will be the many incentives that have existed for floating home owners to locate on Hayden Island, and the importance of those displaced homeowners being able to remain in the Island environment. This will be a very small part of a gargantuan project and we are confident the CRC, just as the Port of Portland did for Lemon Island floating homes, can secure a new moorage for them.

HINooN and Hayden Island residents and businesses stands committed to supporting the Columbia River Crossings. We simply ask that promises made are kept, the original Hayden Island Plan be honored, mitigation be maximized for a critically sensitive area and population, community enhancement be a significant olive branch for reparations to the citizenry and that a simple construction project be added to provide for a small floating home marina.

Sincerely,

Ronald Schmidt, Chair

Cc: Mayor Sam Adams, City of Portland
Chief Mayor Tim Leavitt, City of Vancouver Mayor
City of Portland Department of Transportation

improvements are beyond the benefits identified as the project's purpose and need. These tangible improvements include new local roads and improved local flow and connections for Hayden Island residents; better bike and pedestrian access to the improved facilities; new bike and pedestrian trails; and a separate bridge for local auto access from North Portland to Hayden Island. We know there is more to be done. The CRC remains committed to aggressively maximizing and leveraging resources to bring additional benefits and improvements to our community. Two options have been identified for further exploration, both include a financial set-aside of a specific amount dedicated to a specific purpose. One approach is a project-specific community enhancement fund. There is some history with such an approach - the Delta Park 1-5 widening project (2006) and Metro's solid waste program (1991) are two examples. The other approach is a different concept, a regional fund established by the state to benefit the neighborhoods and communities in close proximity to 1-5 and the CRC project. Both approaches have been successfully implemented in the Portland region and will help inform this effort. We need to be clear about both of these approaches - neither will be easy. Both approaches have limitations and legal restrictions associated with anticipated funding sources. Both will require legislative support. Both will likely need enabling legislation and both will require funding.

N-003-006

Chapter 3 (Section 3.3) of the DEIS disclosed all known floating home displacements that would result from the two highway and two transit alternatives crossing the North Portland Harbor (pages 3-105 and 3-112, respectively). The DEIS also listed potential mitigation measures tailored to suit the unique situation of the floating home community (page 3-119).

For the FEIS analysis, the CRC project team worked to better understand the organization of the floating home communities in the North Portland Harbor. As presented in Chapter 3 (Section 3.5) and

Hayden Island Needs related to the CRC Project

Pre-construction Needs

N-003-007 Specific agreement on mitigations, and community enhancement funds before the project is underway and recognition of the status of the Manufactured Home community as an Environmental Justice (EJ) community.

N-003-008 Construction Information Center on the Island, a website, and a Community Hot Line (for residents to call for any emergency caused by construction and to answer questions about street closures, etc.), plans for Island access and circulation during construction including a monthly island news letter with CRC construction information.

Assistance for businesses planning to stay on the Island and new businesses needed during construction (e.g. food carts, farmer's markets, grocery, pharmacy). We understand the new Target will have some groceries and a pharmacy but Target will not have a full service grocery. Inclusion of a full service grocery to replace Safeway is uncertain at this point but critically needed.

Early construction of the Hayden Island local arterial bridge to ease traffic bottlenecks on/off the island during construction.

Give local residents priority for new project jobs on the island (e.g. flaggers, info center hosts, environmental protection monitors, Hot Line operators, newsletter reporters/editors, etc).

A plan for local bus/shuttle service during construction.

N-003-009 Assistance for floating home owners being displaced.

N-003-010 Assistance for individual EJ community residents who might be sensitive to construction impacts and disturbance.

N-003-011 Enhanced security services for vacant properties and vacant land during right of way acquisition.

N-003-012 Ongoing community engagement and participation (probably through the Portland Working Group and sub-groups) beginning now and continuing through project completion.

Needs During Construction

Crime Prevention

N-003-013 Add extra security services for crime prevention/mitigation during construction. That would be

Chapter 6 (Public Involvement) of the FEIS, the team coordinated with floating home owners, moorage owners, Boards, and management to gather address and ownership information for each floating home. The impacts to individual floating homes are described in Chapter 3 (Section 3.3) of the FEIS and listed in Appendix E - List of Potential Property Acquisitions.

In the course of conversations with potentially affected property owners, CRC staff received inquiries about the potential for constructing a new marina to accommodate displaced floating homes. To better understand issues related to new marina permitting and construction, project staff conducted research on the development of marinas. This research found likely challenges to developing a new floating home marina, including the challenge of receiving permits through local jurisdictions and environmental resource agencies. The project is not pursuing construction of a floating home marina.

As with any other acquisitions, the CRC will obtain independent appraisals to determine fair market value for each home that must be displaced but cannot be relocated. Qualified acquisition agents will work closely with each floating home owner to try to arrive at mutually agreeable terms for the purchase of each home. The agents will also provide relocation assistance to all displaced occupants.

N-003-007

Regarding a Community Enhancement Fund, please see response N-003-005.

Regarding the Manufactured Home Community being an EJ community:

Updated population and demographic information can be found in Chapter 3 (Section 3.5) of the FEIS. The displacement survey (which focused on the most directly impacted households) was undertaken in

N-003-013 for both businesses & residences paying particular attention to vacated homes/businesses and preventing the homeless from living there.

Island Livability

Have an Observation Deck/Viewing Platform so people can safely observe the construction.

Have a local bus/shuttle service during construction.

If the island is without a grocery store for a period of time, provide on-call island shuttle services for getting disabled, senior and non-drivers to a grocery store.

Traffic Management:

Cars – always have two way streets going east/west across the bridge area. One way streets with flaggers are simply not adequate for the traffic on the island.

Bicycles/scooters/pedestrians – Have smooth surface paths east/west across the bridge area for bicycles and scooters (people with limited mobility) and foot traffic.

Have a specific plan for getting emergency vehicles on/off the island during construction with no delays.

Vibration

N-003-014 Home inspections of before and after construction for any possible damages caused by construction vibrations especially for those that are closer to the staging areas and river.

Public Health and Safety

N-003-015 The Island Community has not seen the FEIS but we expect it will contain detailed mitigation measures for protection of Island Residents, visitors and workers. Specific impacts of concern include:

Dust and other air pollutants There must be dust and air quality monitoring and control measures. Those who live closest to the staging and construction areas will be most exposed to dust and contaminants for a lengthy period. The respiratory health of seniors and other sensitive receptors must be protected. Home air conditioners, air filtration, replacements for louvered windows, and other measures may be necessary for protection from dust and fumes, especially those nearest the staging areas. The cleanest available diesel technology must be used for all construction equipment. Regular health care checkups and medical attention must be available for residents with existing respiratory problems, regardless of whether or not they have health insurance.

response to assertions that the Census data misrepresented the affected community. The U.S. Census data indicate that, as a whole, the Hayden Island neighborhood has a lower proportion of minority and low income households than the City of Portland, Multnomah County, or in the Project study area. Hayden Island ranks near the lower end of the spectrum in both minority and low income household composition when compared with all other neighborhoods in the study area. Households within the Manufactured Home Community were not surveyed, but these households also will not be displaced. The CRC recognizes that there are low income and minority households on Hayden Island and that they may be more frequently found within the Manufactured Home Community than elsewhere on the island. The project will consider the potential for disproportionate impacts to any low income or minority household regardless of the demographics of the surrounding neighborhood.

N-003-008

The CRC project is working to minimize temporary impacts during construction that could impede travel in the project area. These temporary effects were described in Chapter 3 (Section 3.1) of the DEIS, and are refined in Chapter 3 (Section 3.1) of the FEIS, which also includes proposed measures to mitigate these impacts.

As the project moves into its final design phase, the CRC project team will complete a construction staging plan that will address, in greater detail, temporary closures, detours, and access on the highway and local streets affected by construction. This construction staging plan will indicate to contractors the proposed sequencing of construction based on DOT standards. Contractors are often given the opportunity to modify the construction staging plan to maximize construction efficiency and economy, but are required to fulfill DOT performance standards for temporary impacts.

N-003-016

Noise Temporary sound barriers, low noise equipment, air conditioning (so residents can keep windows closed) and other noise mitigation measures must be used as necessary to protect nearby residents and businesses.

Asbestos and other contaminants - Contaminants in buildings to be demolished (like the Thunderbird Hotel) and in soil to be disturbed (especially in the historic landfill along Hayden Bay Drive) must be identified and properly handled during disposal.

Light Nighttime lighting of construction and storage area is necessary for public safety and security but nearby residents must be protected from light pollution.

Business

N-003-017

From the very small amount of construction around Target and on Hayden Island Drive in preparation for building the new Target, business in the mall has dropped off considerably. Access mitigation measures must be implemented to protect Island businesses during the freeway, interchange, and bridge construction. Provide extra signage on I-5, in Vancouver, and in Portland south of Hayden Island showing that businesses on Hayden Island are open for business during construction.

Hayden Island Features Expected from Basic Funding of Project

N-003-018

The Island Community expects completion of all project features shown on CRC maps of the latest preferred project alternative. These include:

- The Extension of Tomahawk Island Drive under the freeway,
- The local arterial bridge connection to the Marine Drive Interchange area,
- All freeway and local roads and structures for island access and circulation,
- The light rail extension with a Hayden Island station
- Safe walkways, signalized crosswalks, protected bike lanes and multi-purpose pathways
- Attractive retaining walls, sound walls, and landscaping for ODOT Right of Way and local streets per the Hayden Island Plan.

N-003-019

The Island Community expects support from the City, TriMet and others to promote new mixed-use development around the new light rail station consistent with the Hayden Island Plan.

N-003-020

HiNooN and HILP expect a park-and-ride facility on the island for seniors and handicapped residents in light of the lack of local bus service on the island and the planned termination of park-and-ride service at the Expo Center. Alternatively, an east west shuttle bus service on the island could move residents to and from the transit station.

The project has endeavored to avoid the displacement of businesses, though it is not possible to do so within the densely developed corridor. The project will continue to look for ways in which impacts can be minimized and avoided.

The displacement of Safeway is documented in the FEIS. Compensation for this impact is governed by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. The project will suggest that Safeway relocate on Hayden Island, but cannot require them to relocate in any specific location. The eventual relocation will be a business decision by Safeway.

The possibility of early construction of the local multimodal bridge will continue to be a consideration by the project as project sequencing is refined. It is also discussed in Chapter 2 of the FEIS, (Section 2.3.1), but not as mitigation. Although it is not appropriate to describe the early construction as mitigation, it is discussed as something we will explore as we further refine construction staging. Specifically Section 2.3.1 of the FEIS states:

> Similarly, the Marine Drive interchange construction would need to be coordinated with construction of the southbound lanes coming from Vancouver. While this interchange can be constructed independently from the work described above, the completion and utilization of the ramp system between Hayden Island and Marine Drive requires the work to occur in the same period. Early construction of the local multimodal bridge between Marine Drive and Hayden Island, so that it can be used as an alternate access route during the remaining construction period, will be analyzed during final design. The interchange reconstruction also needs to occur so that Marine Drive can be elevated, allowing the light rail extension to cross under Marine Drive. The Marine Drive

N-003-021 The Island Community expects the east of I-5 neighborhood retail zone in the Hayden Island Concept Plan to be reconciled with the CRC proposal for storm water facilities in the same location. The planned storm water treatment wetlands will take many acres of land planned for other uses. Fenced contaminated treatment wetlands are not appropriate in an urban environment.

The Hayden Island Plan calls for a significant "Gateway Park" on the Columbia River as a post-construction re-use of the of Thunderbird Hotel site and the vacant area under the existing and new bridges. Also, the Plan calls for a public water access park on the north shore of North Portland Harbor at the I-5 crossing.

A multi-use path on the east side of I-5 from Marine Drive to the CR Bridge.

Additional Post Construction Hayden Island Needs

N-003-022 Community Center. Staff the Center with help for seniors and vulnerable residents of the island.

N-003-023 An enhanced security system with coordination of City, TriMet, State, local security forces; coordination of local business hours with TriMet operating hours; landscape maintenance, lighting and other measures to control transients.

Floating Home Specific Needs (Jantzen Beach Moorage)

N-003-024 New floating home moorage to permanently relocate displaced floating homes and to temporarily locate those moved out for the construction stage.

Parking structure to replace parking lots taken.

Relocate remainder of Jantzen Avenue further north to allow Jantzen Beach moorage to keep the private road for additional parking and other needs.

All existing and new utility lines crossing Jantzen Beach Moorage to be buried underground.

interchange is expected to take a little more than 3 years to construct, including work at the Victory Boulevard interchange.

N-003-009

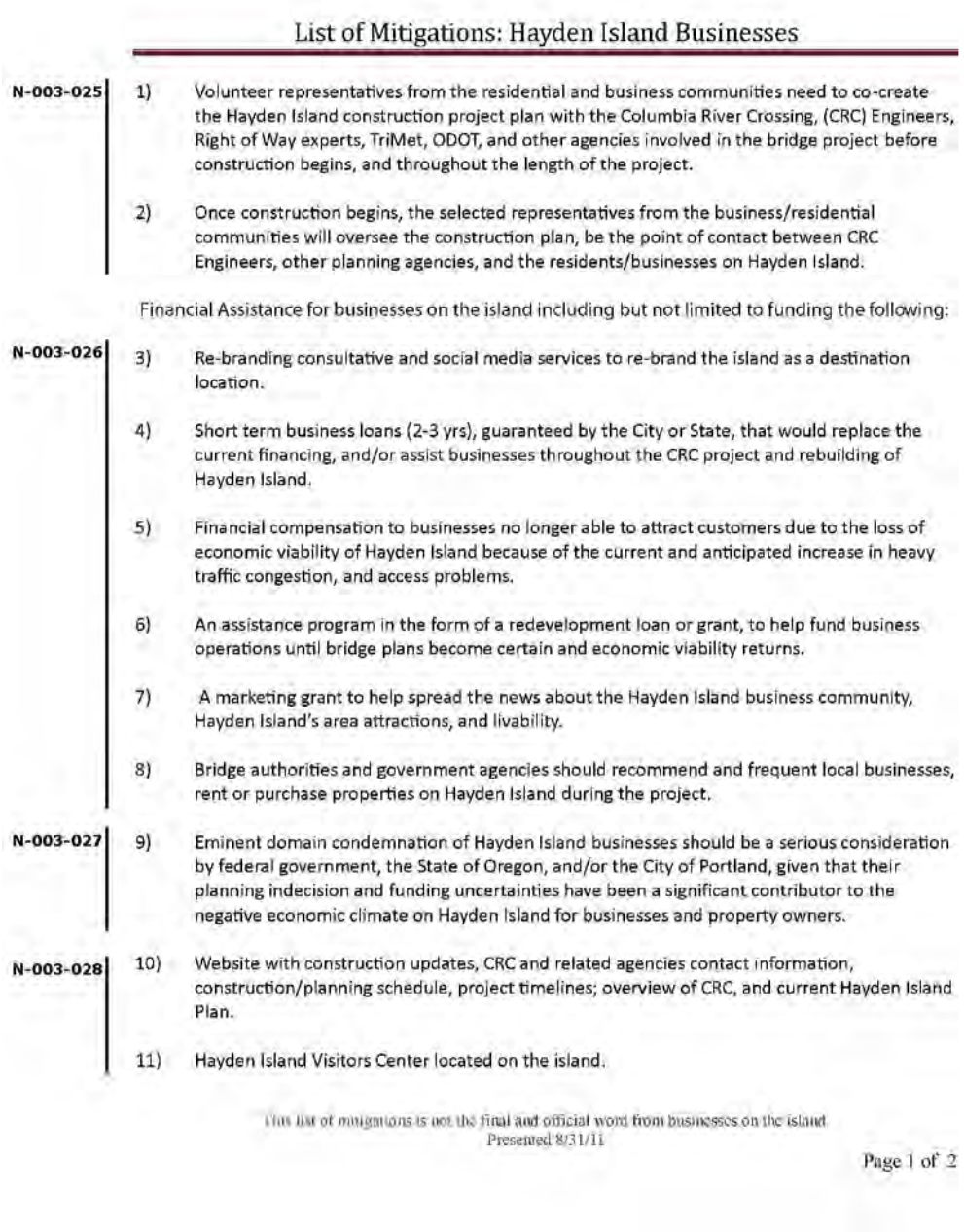
Please see response N-003-006.

N-003-010

The project's focus will be on preventing and minimizing the impacts at the source. There is a list of proposed measures below. But the project will also work closely with the community and will want to know of individuals and households with unique circumstances who may be differently impacted than their neighbors. As construction plans are advanced, we will be sharing details with the neighborhood association and with businesses on the island.

The project has committed to the following mitigation measures as described on pages 3-283 to 3-285 of the FEIS:

- Control dust and exhaust emissions from demolition and construction activities.
- Require contractors to comply with State of Oregon standard specifications (Section 290) for dust, diesel vehicles, and burning activities.
- Follow State of Oregon's specifications for truck staging areas for diesel-powered vehicles.
- Use ultra low sulfur diesel for diesel construction vehicles and equipment, or otherwise comply with any new, more stringent regulations in place at the time of construction.
- Pursue emerging technologies for cleaner construction emissions, like the use of diesel scrubbers for compatible equipment, and continue to encourage and require those types of technologies as bidding laws allow.
- Require stationary sources, such as concrete mix and asphalt



List of Mitigations: Hayden Island Businesses

N-003-025

1) Volunteer representatives from the residential and business communities need to co-create the Hayden Island construction project plan with the Columbia River Crossing, (CRC) Engineers, Right of Way experts, TriMet, ODOT, and other agencies involved in the bridge project before construction begins, and throughout the length of the project.

2) Once construction begins, the selected representatives from the business/residential communities will oversee the construction plan, be the point of contact between CRC Engineers, other planning agencies, and the residents/businesses on Hayden Island.

Financial Assistance for businesses on the island including but not limited to funding the following:

N-003-026

3) Re-branding consultative and social media services to re-brand the island as a destination location.

4) Short term business loans (2-3 yrs), guaranteed by the City or State, that would replace the current financing, and/or assist businesses throughout the CRC project and rebuilding of Hayden Island.

5) Financial compensation to businesses no longer able to attract customers due to the loss of economic viability of Hayden Island because of the current and anticipated increase in heavy traffic congestion, and access problems.

6) An assistance program in the form of a redevelopment loan or grant, to help fund business operations until bridge plans become certain and economic viability returns.

7) A marketing grant to help spread the news about the Hayden Island business community, Hayden Island's area attractions, and livability.

8) Bridge authorities and government agencies should recommend and frequent local businesses, rent or purchase properties on Hayden Island during the project.

N-003-027

9) Eminent domain condemnation of Hayden Island businesses should be a serious consideration by federal government, the State of Oregon, and/or the City of Portland, given that their planning indecision and funding uncertainties have been a significant contributor to the negative economic climate on Hayden Island for businesses and property owners.

N-003-028

10) Website with construction updates, CRC and related agencies contact information, construction/planning schedule, project timelines; overview of CRC, and current Hayden Island Plan.

11) Hayden Island Visitors Center located on the island.

This list of mitigations is not the final and official word from businesses on the island
Presented 8/31/11

Page 1 of 2

plants, to obtain an Air Contaminant Discharge Permit from either DEQ or SWCAA and to comply with regulations for controlling dust and other pollutant emissions.

- Manage construction materials and activities to minimize dust, glare and smoke.

N-003-011

In an effort to reduce the potential for inappropriate use of vacated property, the CRC project may install fencing and signage to minimize the potential for trespassing. These methods will be detailed by the DOT in the construction staging plan, which will be executed by the contractor.

Should these vacated properties become an attractive nuisance, the CRC project could shorten timelines for demolition, or contract with a firm to provide part-time or full-time security. The CRC project team will work with neighborhoods likely affected by project staging to identify a plan that best meets the needs of nearby residents, business owners, and the contractor.

N-003-012

Thank you for your comment. The project will work closely with you, Island residents, organizations, and businesses.

N-003-013

Regarding the potential for inappropriate use of vacated property, please see N-003-011.

The project is working on a construction-period transit plan. Tentatively, these plans include a shuttle service. But how this will aid Island residents will be further developed, and will be discussed with the community as one of many ways to provide mobility on the Island.

List of Mitigations: Hayden Island Businesses

N-003-028	12)	A hotline for people to call about CRC construction, theft, vandalism, an accident, or if there is a problem associated with the construction.
	13)	Financial Assistance to attract new businesses to Hayden Island before and during construction.
N-003-029	14)	Early construction of the Hayden Island local arterial bridge to ease traffic bottlenecks on/off the island during construction.
	15)	Create reliable transportation during the construction.
	16)	Ensure traffic can enter and exit the island with ease.
N-003-030	17)	Enhanced security services for vacant residential and business properties. More police presence on the West & East sides of Hayden Island.
	18)	A satellite police station needs to be placed in a visible location on Hayden Island with routine daily and nightly island patrols!
N-003-031	19)	Home and business inspections before and after construction for any possible damages caused by construction vibrations especially for those that are closer to the staging areas and river.
N-003-032	20)	Additional streetlights need to be added to ensure safety at night for pedestrians and motorists. Especially on the newly created "main street" of town.
N-003-033	21)	City/State/Federal Government need to supply a large billboard alerting drivers on I-5 South and I-5 North that "Businesses Are Open." Also, small signs strategically located throughout Hayden Island and on the West and East sides of the Island for pedestrians, bike riders and slow moving motorists.
N-003-034	22)	The Island Community made up of residents and businesses expects support from the City, State, Federal Government, Portland Development Commission; Metro, Business Oregon, Venture Portland, TriMet, and other governing agencies to financially assist in ways to attract more business to the island.

This list of mitigations is not the final and official word from businesses on the island.
Presented 8/31/11

Page 2 of 2

As discussed in the response to N-003-008, the CRC project is working to minimize temporary impacts during construction that could impede travel in the project area.

N-003-014

Potential noise and vibration impacts that would result from the CRC project were disclosed in Chapter 3 (Section 3.11) of the DEIS, and have been updated in Chapter 3 (Section 3.11) of the FEIS. As described in the DEIS and FEIS, the FTA has also developed impact criteria for acceptable levels of ground-borne vibration. Light rail operations could result in some vibration impacts along 17th Street and Washington Street, all of which could be mitigated by installing vibration isolation between the rails and ground. This has also been updated for the FEIS in Chapter 3 (Section 3.11). No expected vibration-related impacts have been identified on Hayden Island. However, as the approach to construction is finalized, the project will assess the potential for vibration resulting from the staging area activities and construction. If the project identifies any potential for vibration-related impacts, it will work with property owners to minimize such and develop adequate documentation to evaluate such. Before-and-after assessments of building foundations and walls is often part of this evaluation.

N-003-015

Please see the response to N-003-010.

N-003-016

The project has committed to the design and construction of a temporary noise barrier on the far western edge of the Thunderbird Staging Area. The project will work to direct, reduce, and baffle (shield) construction lights which would adversely impact the nearby residents.

The FEIS contains a summary of the information obtained during

preparation of the Hazardous Materials Technical Report. The technical report does have some specific information and research regarding potential contaminants for identified sites. However, it is only for sites identified in regulatory databases, not every property within the corridor. The scope of an environmental impact statement in a large corridor does not include specific on-site investigation of hazardous materials on every single property; it generally looks at summary information for the entire corridor (i.e. regulatory database, aerial photos, Sanborn maps, and windshield survey) to provide an overview of potential issues and how that could impact the various alternatives.

The project will investigate and appropriately handle contaminants found at all properties permanently or temporarily acquired.

N-003-017

Construction activities associated with transit and highway improvements have the potential to negatively and positively affect nearby businesses, as described in Chapter 3 (Section 3.4) of the DEIS and the FEIS. For example, construction could temporarily block visibility and access to specific businesses, cause traffic delays, and reroute traffic to detours, all of which could divert customers and hamper business activities. Potential positive construction effects could include increased spending in the project area during construction, which can, for example, increase sales at local shops and restaurants.

The project team will work to minimize negative business impacts and encourage positive impacts. Construction will be carefully planned to minimize road closures and to avoid completely closing access to businesses. When needed, signs would be used to identify temporary access points and the businesses they serve. Detours would be carefully routed to reduce travel times and be signed to reduce confusion. Programs to help businesses affected during construction could include business planning assistance, marketing and retail consulting, or

promotions to generate patronage in construction areas. See Chapter 3 (Section 3.4) of the FEIS for more discussion on temporary construction effects and possible mitigation measures.

N-003-018

These elements are all incorporated into the design of the Locally Preferred Alternative.

N-003-019

As described in Chapter 3 (Section 3.4) of the DEIS and FEIS, and in the Indirect Effects Technical Report, the CRC project will reinforce the region’s goals of concentrating development in regional centers, reinforcing existing corridors, and promoting transit and pedestrian friendly development and development patterns. The project will coordinate with the City of Portland, although specific zoning changes or incentives for transit oriented development are primarily the City's responsibility. However, the multi-million dollar investment provided by the project has been shown to positively contribute to such development.

N-003-020

On-street parking is shown in the current roadway designs for Tomahawk Island Drive. The project will work with the City of Portland and the Hayden Island community to refine the parking designations near the LRT station. There will be consideration of accommodating a small area as a "kiss and ride" for residents to be safely dropped off near the station. Delta Park will serve as the nearest park and ride to the Hayden Island light rail station, a distance of 1.17 miles from the Hayden Island light rail station. The distance between the park and ride lots at Expo Center and Delta Park is 0.69 miles.

N-003-021

Regarding stormwater facilities, please see the response to N-003-003.

The project has no impact to public parks on Hayden Island and therefore has no need for such mitigation. The CRC project does not currently propose to convert the existing Thunderbird site on Hayden Island into a public park, but it also does not preclude it from becoming a public park in the future. Decisions regarding the disposal of surplus property after project construction will be made at a later date. The eastside multi-use path is part of the LPA.

N-003-022

Though the Island may benefit from a new Community Center, it is not the project's role to provide one. The project is providing millions of dollars of improvement for the Island. These investments will be part of the set of incentives that will help drive redevelopment of the commercial areas and will contribute to the vibrancy of Island neighborhoods.

N-003-023

Regarding the potential for inappropriate use of vacated property, please see the response to N-003-011.

N-003-024

As the project designs progress, there will be more details made available about utility relocations and the specific for Jantzen Avenue. The project is committed to mitigating any impacts to JBMI and is well aware of the needs for infrastructure improvements and post-construction restorations.

Regarding floating home displacements, please see the response to N-003-006.

N-003-025
The project will work closely with both the residents and business owners on the island as construction plans are advanced.

N-003-026
Regarding the potential for the project to negatively and positively affect nearby businesses, please see N-003-017.

N-003-027
The DEIS disclosed all known property acquisitions required to construct the project alternatives. These acquisitions were summarized in the DEIS in Chapter 3 (Section 3.3) and were listed in full in Appendix D of the DEIS. The information associated with each property, such as an address, was pulled directly from the Clark and Multnomah County tax assessors' databases, and therefore was only as up-to-date as that County's information.

Property owners will receive just compensation for the estimated value of land and improvements acquired and for other impacts that result in a measurable loss of value to the remaining property. Following the publication of the FEIS, property owners will be notified of impacts to their property and acquisition negotiations will begin. The acquisition and relocation process will follow The Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970 (as amended). The process by which acquisitions will occur is described in the Real Property Acquisition and Relocation Plan and summarized in Chapter 3 (Section 3.3) of the FEIS.

N-003-028
Regarding the potential for the project to negatively and positively affect nearby businesses, please see the response to N-003-017.

The project will similarly work to reduce the potential for crime during construction, using lighting, security, and other means.

The project does not have any plans to construct a Visitor Center for the Island. The construction of such a facility is not part of the project's purpose and need. Nor would it represent mitigation for any identified impact to the Island.

N-003-029

The project is eager to work with emergency service and utility providers as the design for the LPA and the approach to construction is further refined. The project has already made commitments to maintaining three through lanes, and to construction-period transit enhancements.

Regarding the possibility of early construction of the local multimodal bridge, please see the response to N-003-008.

N-003-030

Regarding the potential for inappropriate use of vacated property, please see the response to N-003-011.

N-003-031

Section 5.2.2 and Section 6.3.2 of the Noise and Vibration Technical Report discuss construction vibration. Although there are no state or federal regulations related to construction vibration, the contract specification will have a section that would likely limit the contractor to a maximum vibration level. The majority of major vibration-producing activities will be more than 300 feet from the nearest homes at the Hayden Island Manufactured Home Community. Therefore, it is unlikely that vibration levels at that distance will be of sufficient magnitude to result in any structural issues, including structural issues for the manufactured homes.

N-003-032

The project will work closely with the community on the design issues for Tomahawk Drive and the light rail station. Especially in areas where pedestrians will pass under structures, there will be a focus on safety and high quality design. The project's designers have been trained in Crime Prevention Through Environmental Design (CPTED), and will work to provide safe environments under the new facilities and elsewhere.

N-003-033

There are regulations which govern the placement of billboards and other signage. Within these limits, the project will look for ways to encourage commercial activity on the Island during construction. The project has staff that have specific training in this area and have been successful at retaining businesses during past construction projects in Portland. There will be a program developed, which is now outlined in Section 3.4 of the FEIS. The program will provide details regarding business retention investments, mobility programs, pedestrian routing and safety, and much more.

N-003-034

The project will provide a high capacity transit station as well as a safe interchange which will function better than the existing interchange does. These investments will have a beneficial effect on the local economy, though the associated displacements will result in an adverse effect. In addition to providing millions of dollars in improvements, the project will also work with businesses during construction to minimize impacts to businesses and business closures. Parties that are not sponsors of the project have no similar obligation. However, the CRC project will coordinate and collaborate with any other entities working to preserve and cultivate businesses on the Island.

Portland's Directly Impacted Neighborhoods

Official Comments on the Final Environmental Impact Statement for the

Columbia River Crossing

October 24, 2011

Victor M. Mendez
Administrator
Federal Highway Administration

Peter M Rogoff
Administrator
Federal Transit Administrator

RECEIVED
OCT 24 2011
Columbia River Crossing

c/o Heather Wills
Columbia River Crossing
700 Washington Street, Suite 300
Vancouver, Washington 98660

N-004-001

We, the neighborhoods of Portland directly impacted by the Columbia River Crossing Project, support the Locally Preferred Alternative Option A provided the project honors its commitments and continues to work openly with the community as we move forward with final design.

Though we are happy to have reached this important milestone in the development of this complex transportation system for the part of Portland where we live, work, shop and play, there are still many outstanding concerns that need continued good faith work.

The design needs to respect the work of The Hayden Island Plan. The Island could lose 39 local service businesses including its only grocery store and only gas station. 643 people will lose their jobs on the Island; many of those people live in our community. Where are the over a thousand households going to shop for basics now? We need to make sure those real impacts are recognized and that the Island still has a neighborhood center while the project is being built and after the system is opened.

We have consistently supported the construction of a new bridge, but it must be built right - all the way down to the details. Our communities bear the consequences of this project during construction and afterwards. It is important that this project enhances not only the region's transportation network but also enhances the community upon which it is built.

This set of documents is submitted to be part of the FEIS record to memorialize the community understandings and concerns. We want to work even more closely with the CRC project team to together complete a livable design for the Columbia River Crossing.

Sincerely

Hayden Island Neighborhood Bridgeton Neighborhood East Columbia Neighborhood

N-004-001

Each of the attached comments have been considered and responded to. The project looks forward to ongoing coordination and collaboration with Portland neighborhoods and organizations. As the design progresses, and plans for construction are further developed, the project will continue to keep the community informed, participate in problem solving with local citizens, and seek ways to avoid and minimize impacts.

Portland's Directly Impacted Neighborhoods
Comments on the Final Environmental Impact Statement for the Columbia River Crossing

List of Public Comments:

N-004-001

- **Neighborhoods Impacts Overview** Letter
- **Hayden Island Neighborhood** (HiNoon) Letter
- **Bridgeton Neighborhood Association** Letter + 34 Signatures of Neighbors
- **East Columbia Neighborhood Association** Letter
- **Hayden Island Livability Project** (HILP) Letter
- **Hayden island Manufactured Home Community** Letter + 50 Signatures of Neighbors
- **Victor Viets** Letter - List of Hayden Island Issues
- **Brad Howton** Letter - FEIS and the Hayden Island Plan
- **Leslie Sawyer** Letter
- **Tom Dana** Letter
- **Metro Regional Government** Attachment to Land Use Approval - FEIS and post EIS Metro Questions and CRC Responses
- **Urban Design Advisory Group** White Paper comments Build a Better Bridge Faster

EAST COLUMBIA NEIGHBORHOOD ASSOCIATION

Heather Wills
CRC Environmental Manager
700 Washington Street, Suite 300
Vancouver, WA 98660

Dear Ms. Wills,

N-005-001 East Columbia Neighborhood supports the building of a new I-5 bridge, and commits to be a working partner with the CRC project to preserve the quality of life that is so precious to residents of Hayden Island, Bridgeton and East Columbia. The unique characteristics of these neighborhoods is a valuable asset to the residents as well as to the surrounding areas. The East Columbia neighborhood has concerns in several areas. These concerns are outlined below.

Prior commitments that need to be upheld

N-005-002 East Columbia supports the Arterial Bridge from Marine Dr. to Hayden Island and the eastside multiple use path but we are concerned they are now referred to as "options". It has been a neighborhood belief that these were components of the bridge project and not options. Both the IPS and Project Sponsors voted unanimously to include these features in the CRC project. These components are vital to the CRC project and should remain as commitments to the neighborhoods that will depend on them for viable transportation options and connectivity to Hayden Island. The Arterial Bridge will provide accessibility on a variety of levels. Of utmost concern is the accessibility it will provide Portland Firehouse Station #17, which provides fire protection service to Bridgeton and East Columbia neighborhoods.

Incorrect data used for impact statements and assumptions

N-005-003 The FEIS states it is using 2000 Census data and uses a population of 344 for East Columbia. The 2000 Census Bureau data, Summary File 3 states a population of 1,490. Census Bureau information is easily available from ESRI. The City of Portland has this information from both the 2000 Census and the Census Bureau 2010 Redistricting Data (P.L. 94-174). The CRC should update its census data, and the more current and accurate data utilized. As stated in the FEIS, the neighborhood boundaries expanded in November 2008, resulting in the current population being 1,748 according to the US Census Bureau data. Areas encompassed since November 2008 include Deltawood and Fox Run Mobile Home Park – both with a high percentage of low income individuals, and a racially diverse population. These current income and race demographics are also available from ESRI and the City of Portland. There can be no fair or accurate evaluation of impact or demographic description if incorrect and outdated data is used for measurement and evaluation.
The CRC assessment of the Area of Potential Impact is incorrect and flawed for East Columbia. These evaluations should reflect the current population, as well as correct data and comparative numbers in terms of describing impact. If the FEIS is to identify impact and the effects of the CRC project on neighborhoods, then factual data should be used to determine those affects.

In the Appendices on Neighborhood Profiles, it is stated that no crime data exists for East Columbia. Since November 2008, the neighborhood has regularly received crime statistics from the N/NE Portland Police Bureau, Community Policing Officers and ONI Crime Prevention Coordinators. This information is readily available from any of those resources and should be incorporated into the descriptive analyses.

The FEIS states there is no neighborhood plan for East Columbia.
In 1990 East Columbia was the first neighborhood in the city to create and have a Natural Resource Management Plan adopted by City Council. This NRMP has been used in recent land use hearings (2009, 2010), Bureau of Planning reports and as guidance for development in East Columbia. It is available on the City of Portland website. It offers guidance for the development and management of the unique natural resources in East Columbia, as well as environmental stewardship. It should be considered and detailed in the FEIS.

The FEIS lists Community/Neighborhood Resources for East Columbia as only an off leash dog park, East Delta Park and Portland Meadows (all of which were added in the boundary expansion of 2008). The Columbia Children's Arboretum, part of the Portland Parks Bureau, is located in East Columbia and its western boundary is NE 6th which will see impacts from the realignment of the Vancouver Way interchange. Access to the park will be impacted by increased traffic on NE

N-005-001

Thank you for your comment. Each of your specific issues will be addressed below.

N-005-002

Option A, with the arterial crossing, is the design which will be selected in the Record of Decision.

N-005-003

The demographic data provided in the Technical Reports are specific to the portion of the neighborhood that was within the study area. Project staff were able to better assess each neighborhood by focusing on the portion of that neighborhood which would potentially be directly impacted. That is why the population figures do not match with the total population data for each neighborhood.

Though the NRMP is a beneficial plan to have completed, and will be used to guide the minimization of impacts and development of environmental mitigation, it is not specifically a neighborhood plan.

Thank you for alerting us to the availability of crime data for the neighborhood. The advancement of the LPA's design is not likely to change regardless of the specifics of the reported crimes.

N-005-003 6th. The Columbia Children's Arboretum was created in the early 1970s and is the geographical and social heart of East Columbia. The Arboretum is classified as a nature park by PPB and one of only two Arboretums in the City. Additionally East Columbia is home to the Columbia Community Church, which is the monthly meeting place of the neighborhood, as well as holding Sunday services for many in the neighborhood, including Bridgeton residents. These Neighborhood Resources should be listed in the documentation regarding East Columbia.

Community Enhancement Funds

N-005-004 Over the course of the CRC discussions with neighborhoods, a Community Enhancement Fund has been discussed in various formats. This Community Enhancement Fund should be a vital piece of the CRC project and not an option. In order to best assess the impacts of all aspects of the CRC project to neighborhoods, the CRC must use reliable, factual data to determine the demographics of, and level of impact to, neighborhoods most closely aligned with the project. These demographics will inform the environmental justice impacts to neighborhoods. Levels of impact will vary with neighborhoods and project timelines.

In order to accurately determine the impacts of the CRC project the FEIS should contain data that reliably and accurately describes the neighborhoods, and in the case of East Columbia it does not.

Traffic Management/ NE 6th Intersection

N-005-005 There should be careful consideration taken in the redesign of the Vancouver Way and Marine Dr interchange which will have the direct impact of increased traffic on NE 5th Ave.
The intersection of NE 6th, NE Faloma and NE Marine Dr. is currently classified by PBOT as a level D/F intersection. There should be careful consideration, and a redesign of this intersection as a result of the impact of increased traffic on an intersection located within a school zone and classified at a dangerous level. NE 6th is used for TriMet line #8, which draws passengers from East Columbia and Bridgeton. NE 6th does not have sidewalks, so pedestrian safety is an issue. The FEIS should include a traffic management plan for the impacts created by this redesign.

Tree Canopy removal

N-005-006 East Columbia encourages a thorough evaluation of the effects of the planned removal of old growth oak trees along Martin Luther King Blvd, near the Jubitz Truck location. We encourage the CRC project to pursue alternative choices for any tree removal. This area was formerly part of Vanport and is in a managed flood plain, as is all of East Columbia neighborhood. Removal of tree canopy, and especially the number of large trees planned for removal, will adversely affect stormwater runoff in the area. Mention of "tree replacement" should be clearly defined and perhaps the removal of the large trees re-evaluated. There should be a study done to determine how much water will have to be diverted if there is a significant tree removal and how mitigation for this increased stormwater runoff will be handled. These trees not only provide a benefit by diverting stormwater, they provide natural habitat for birds and provide an aesthetically pleasing barrier to the industrial acreage to the east, as well as a shield for areas of East Delta Park to the west..

Noise Study Concerns

N-005-007 The FEIS assumptions on noise do not include overall noise impacts nor do they accurately reflect impacts on surrounding neighborhoods. The FEIS assumptions regarding the proximity of noise impacts are not accurate, as noise can impact a wide ranging area, well beyond the limited scope presented in the FEIS.
East Columbia is directly affected by noise levels from PDX. The western end of both parallel runways are approximately 4,500 ft from the eastern boundary of East Columbia. The level of airport noise is prevalent in our neighborhood, decreasing and increasing depending on wind direction. There appears to be no mention of weather effects for the noise levels created by highway traffic or light rail, or for construction noise. Currently noise from I-5 can be heard in Bridgeton and East Columbia. Noise from PIR can be heard miles in any direction, depending on weather. There should be an in-depth study done on the breadth of noise impacts on surrounding communities already affected by multiple noise producers. Considerations should be taken for weather, duration, and the overall impact that will result in the additional highway traffic noise as well as the limited duration construction noise. Mitigation for these noise impacts, or possible abatement protocols, should be developed. Noise impacts from this project cannot be singularly considered but must be considered as adding to the overall noise impact of the area.

N-005-008 We hope the CRC will provide a commitment to the community to work openly and transparently on the impacts to neighborhoods. We hope the incorrect data contained in the FEIS can be corrected which will then more accurately reflect the neighborhood demographics resulting in a more reliable projection of impacts to surrounding neighborhoods.

Respectfully,

Maryhelen Kincaid
East Columbia Board, Land Use Chair

Sarah Whitefield
East Columbia Board, Chair

N-005-004

In the last three years the CRC project team, the Project Sponsors Council, and CRC advisory groups have focused on incorporating a wide range of community enhancements into the project. The project has looked for ways to leverage the highway and transit investments into additional improvements for project neighbors and local communities. These improvements are beyond the benefits identified as the project's purpose and need. These tangible improvements include new local roads and improved local flow and connections for Hayden Island residents; better bike and pedestrian access to the improved facilities; new bike and pedestrian trails; and a separate bridge for local auto access from North Portland to Hayden Island.

The CRC remains committed to aggressively maximizing and leveraging resources to bring additional benefits and improvements to our community. Two options have been identified for further exploration, both include a financial set aside of a specific amount dedicated to a specific purpose. One approach is a project specific community enhancement fund. There is some history with such an approach - the Delta Park 1-5 widening project (2006) and Metro's solid waste program (1991) are two examples. The other approach is a different concept, a regional fund established by the state to benefit the neighborhoods and communities in close proximity to 1-5 and the CRC project. Both approaches have been successfully implemented in the Portland region and will help inform this effort. We need to be clear about both of these approaches - neither will be easy. Both approaches have limitations and legal restrictions associated with anticipated funding sources. Both will require legislative support. Both will likely need enabling legislation and both will require funding.

N-005-005

The project proposes a major redesign of the Marine Drive interchange. The redesign is intended to improve operational efficiency and safety.

On the east side of I-5, Martin L. King, Jr. Boulevard will become the principal road connecting with the interchange. Alternative routing using a new connection in the vicinity of East Delta Park will allow traffic from N. Marine Drive to connect with the reconfigured interchange. A description of the project's proposed changes for the interchange can be found beginning on page 2-13 of the DEIS.

The entirety of NE 6th Avenue is outside the study area of the project. In the City of Portland's Transportation System Plan, NE 6th Avenue is designated as a local service street, a community transit street, a city walkway for a portion, a local service walkway for a portion, and a local service bikeway. Improvements to NE 6th Avenue and to the identified intersections are best addressed by working with the City of Portland.

N-005-006

The LPA shows that several large oak trees and potentially other tree species will likely be removed as part of the Marine Drive Interchange Realignment. The CRC project is committed to minimizing environmental effects of the project. Should those trees need to be removed, compensation in the form of revegetation to City of Portland standards will likely be required. The CRC project recognizes the importance of tree canopy and vegetation in capturing and releasing rainfall. Stormwater treatment systems are proposed that will address stormwater quality and quantity in the Columbia Slough drainage area. Because the number and area of the trees is relatively small in relation to the overall drainage areas, existing interception of rainfall is likely minimal. With the planting of new trees, effects to rainfall interception and aesthetic issues will be limited.

N-005-007

Potential noise and vibration impacts that would result from the CRC project were disclosed in Chapter 3 (Section 3.11) of the FEIS. A complete detailed noise and vibration analysis can be found in the Noise

and Vibration Technical Report for the Final Environmental Impact Statement on the Project web site under the Final Environmental Impact Statement. For traffic noise on public highways, the FHWA collaborates with the DOTs to set the traffic noise abatement criteria for highway noise, which are then implemented by the state DOTs.

Noise walls, to the extent that they are effective at reducing noise and can be constructed at a reasonable cost, are the most common type of mitigation for highway noise when project-related noise levels exceed the abatement criteria. The FEIS provides recommended locations for eleven new or replacement noise walls that are preliminarily considered reasonable and feasible by state criteria. These eleven noise walls are effective at reducing noise impacts from approximately 270 decibels under the No-Build alternative, to approximately 110 decibels with the Columbia River Crossing Preferred Alternative. All remaining impacts are at locations where noise abatement was simply not effective, either due to topographical conditions, or because the impacts are at upper floors that are difficult to mitigate with noise walls. Information on the noise walls used to mitigate project-related highway noise impacts can be found in the FEIS (Chapter 3 Section 3.11), with detailed information also provided in the Noise and Vibration Technical Report.

Noise and vibration related to the operation of the light rail and bus facilities are evaluated using the criteria in the FTA Guidance Manual for Transit Noise and Vibration Impact Assessment. Based on the analysis performed for the FEIS, light rail operations are predicted to result in several noise impacts, all of which could be mitigated with a combination of noise walls, building sound insulation, and vibration dampeners installed around the rails. More information can be found in the FEIS Chapter 3 (Section 3.11), with detailed information also provided in the Noise and Vibration Technical Report.

In direct response to your concerns about Portland International Airport

(PDX), the Federal Aviation Administration is responsible for noise from airports. There is no direct connection between the noise from the airport and the noise from the highway or light rail. Also, the noise measurements taken as part of the Columbia River Crossing Project do include the noise from all area noise sources, including both airports (PDX and Pearson Airport), commercial activities, residential activities, existing traffic on I-5, local arterial and connector roadways, and any construction activities at the time of the monitoring. Furthermore, the traffic noise study uses traffic volumes, posted speeds, and vehicle mixtures (cars, delivery trucks, and long-haul trucks and dump trucks) that are projected for the year 2030, and therefore any noise abatement measures are designed to be effective for 20 years.

Atmospheric conditions that can affect the transmission of noise include wind, temperature, humidity, and precipitation. Wind can increase sound levels if it is blowing from the noise source to the receiver; conversely, it can reduce noise levels if blowing in the opposite direction. Noise propagation can also be affected when the temperature gradient is such that an inversion is formed. Other atmospheric conditions such as humidity and precipitation are rarely severe enough to result in significant changes in noise level propagation. However, because weather conditions frequently change, it is not realistic to consider atmospheric conditions in traffic noise studies.

Finally, because the noise models were validated with measured noise levels that, as previously stated, did include all area noise sources, and because the analysis uses projected future 2030 operational information, the study provides a cumulative noise assessment of all noise-sensitive properties that could be adversely affected by noise. That is not to discount the fact that there are many residences that can hear noise from the airports, highways, and other local area noise sources, as these noise sources are all part of living in an urban area. Providing a noise study that included all the area noise sources, (which vary constantly)

under all the varying weather conditions, cannot be reasonably performed. Furthermore, the results of the study would likely yield the same general results: provide noise walls for surface transportation noise to reduce noise levels for those most severely affected.

N-005-008

Thank you for your cooperation and comments.

October 24, 2011

Sam Adams
Mayor, City of Portland
1221 SW 4th Avenue, Room 340
Portland, Oregon 97204

Sam,

N-006-001

I submitted these comments to accompany the FEIS transmittal to the FTA and FHWA as part of the package of like documents produced by other concerned Hayden Island community groups and individuals. For the most part, they describe decisions made after publication of the DEIS that could adversely affect the Community's opportunity to see its vision implemented. Although I remain optimistic that future discussions will yield solutions to the issues raised here, I'm concerned that the City's goals in this process as they relate to Hayden Island are losing traction. That 'last chance' for Hayden Island's future we all acknowledged three or four years ago is here, today!

The CRC FEIS and the Hayden Island Plan

N-006-002

The Hayden Island Plan, representing a unified vision for the Hayden Island Community, was developed by Portland Planning with direction from a 30 member Island Steering Committee. It was drawn together over a 2 year period beginning in 2007 that included a 4 day public Charrette, and several open houses. The Plan, and its associated ordinances, was adopted by the Portland City Council in September 2009. It was developed energetically and quickly to inform the CRC planning and design processes, and to provide guidance to local leadership during their participation in these processes.

Island residents have contributed a tremendous volume of thoughtful and constructive participation to these deliberations, and have been generally pleased with the agency's willingness to respond to the Island's insistent appeals to comply with the Plan. With the adoption of the final version of LPA (Option A in the FEIS), the community felt reasonably confident we had received a firm commitment to a planning framework that could accommodate its vision. We are disappointed this commitment has not been maintained.

One of the core design elements in the HI Plan assumes the neighborhoods would enjoy a pedestrian oriented 'Main Street' along Tomahawk Island Drive, to include the Light-Rail Station and an **East-Side Retail Center** on opposite sides of the I-5 corridor. This area, zoned General and Neighborhood Commercial, is expected to be developed with new small-scale retail tenants complementing existing service and restaurant businesses, forming a gathering and shopping hub tied to the west side by TI Drive and the planned loop road. The draft FEIS proscribes this concept by locating isolated and restricted stormwater

N-006-001

Thank you for your comments. CRC project staff will continue to work with stakeholders and the public through the design and construction process.

N-006-002

The stormwater facilities shown in the FEIS will continue to be refined as design work progresses. Under the terms of the biological opinion (BO), the CRC project must treat stormwater runoff using bioretention, bioslopes, infiltration ponds, porous pavement, constructed wetlands, and vegetated and soil amended swales designed for infiltration. Based on the information we have on file, stormwater runoff is currently not treated before being released to North Portland Harbor or the Columbia River.

The Hayden Island Redevelopment Plan states that runoff from local streets will be treated in roadside planters and that CRC stormwater will be managed in a "green, state-of-the-art manner." Although the Hayden Island Plan map did not show the constructed wetlands, these are a "green" concept for stormwater treatment, and have been shown in project designs as early as May 2009. The stormwater treatment proposed in the FEIS does include the "green streets" approach proposed in the Hayden Island Redevelopment Plan to the extent feasible. This approach to stormwater treatment is not suitable for streets located under bridges (where it will be difficult to establish plants) or where streets are at or below the seasonal high groundwater table. We will continue to review the developing design to determine whether additional streets lend themselves to this method of runoff treatment. Regardless, the project still needs to manage runoff from almost 28 acres of impervious area consisting of I-5 pavement across Hayden island, associated ramps, the elevated transit guideway, and structures.

N-006-002 facilities north and south of TI Drive. This would mean a loss of new neighborhood support services, and of a planning element designed to tie the two halves of the island together. This relatively new strategy was brought into the planning mix very recently, and added to the FEIS without consideration for the HI Plan or adequate public discussion. It appears the Island will lose its planned neighborhood retail core for a couple of swamps behind cyclone fences. The community will expect significant mitigation for the loss of this important HI Plan element.

N-006-003 The HI Plan anticipates at least two significant new **Parks**, located on the north and south sides of the island, partially developed under freeway structures, adding to the very minimal 1 Acre of existing public parkland on the Island. Public discussions and planning sessions led us to believe that land in both sites would be reserved for this purpose, anticipating development by the CRC and/or City of Portland. FEIS documents suggest additional isolated and restricted stormwater facilities will be developed on the north side of the Island under the freeway structures, and planned park facilities are no longer indicated for either the northern or southern sites. Again, this change was added to the FEIS without apparent consideration for the HI Plan, and without adequate public discussion. The community will expect significant mitigation for the loss of this important HI Plan element.

N-006-004 These changes appear to have been made at the direction of Oregon's Department of Transportation. They represent often repeated examples of unwillingness on the part of the DOTs' to candidly consider the impact of 'standard' and 'best' practices on the ability of the community to achieve the pedestrian/bicycle oriented, urban waterfront village represented by the Hayden Island Plan. This unwillingness to consider creative accommodations to the Island community's interests was also represented in their reluctance to provide definition to even preliminary IAMP concepts prior to submission of the FEIS. The design of a pedestrian/bicycle/scooter/vehicle **Circulation Strategy** is a key to the long-term success of the village concept. This environmental matter has been seemingly pushed forward to avoid the effort required for inventive design or the difficult conversations that may be necessary in creating an acceptable solution. The design of the loop road and main-street connecting the light-rail station, shopping center, neighborhood commercial district, grocery, banks, and other services essential to a healthy, self-sustaining community must facilitate this circulation rather than discourage it. The FEIS does not adequately consider these issues.

N-006-005 The FEIS document suggests, for the first time, that the project will 'displace' 69 businesses, the result of construction activities or planned structures. The HI Plan describes a largely self-sustaining **Community**, with retail, service, light manufacturing, and other commercial activities providing employment and day-to-day neighborhood services to a diverse population expected to more than double in the next 20 years. The potential loss of up to half of the businesses currently in the community will represent a significant set-back to its future. The project needs to consider this loss and its impact on the HI Plan more carefully, make a concerted effort to retain key businesses, and potentially develop incentives to restore lost services.

N-006-003

Regarding stormwater treatment, please see the response to N-006-002.

The process for the final decisions regarding the disposition of any surplus property is made following the completion of construction. The potential uses of this specific site as a park and its potential to be declared surplus property will be discussed and coordinated with residents, local property owners, and project partners.

The transfer of 0.4 acre of surplus land to the City of Vancouver is mitigation for the project's direct impact on the City's existing Waterfront Park, an existing public park and a Section 4(f) resource. The project has no impact to public parks on Hayden Island and therefore no need for such mitigation. The CRC project does not currently propose to convert the existing Thunderbird site on Hayden Island into a public park, but it also does not preclude it from becoming a public park in the future.

N-006-004

The project has endeavored to develop creative solutions for the island, but must do so within established design parameters related to mobility and safety. The project will greatly improve circulation on the island, widening many sidewalks, adding bike lanes, and completing Tomahawk Island Drive. The project is willing to collaborate on an island circulation study, although this would be more appropriately led by the City of Portland.

N-006-005

The FEIS disclosed all known property acquisitions required to construct the LPA. These acquisitions were summarized in the DEIS in Chapter 3 (Section 3.3) and have been shared at numerous recent meetings on Hayden Island and elsewhere.

Since the publication of the DEIS in May of 2008, and the selection of

N-006-005

For the first time in this Hayden Island Community's history, the Hayden Island Plan has provided a view of the future for its residents. Our general goals for the extensive public process and development of the Plan document were to memorialize over 20 years of conversation about the potential of our community, to take advantage of what might be our last chance to formalize a bold, effective plan for the Island's future, and to provide a framework of urban planning tools that can help us implement that vision. We managed the process with the understanding that the CRC Project provided both an opportunity and challenge. We have broadly participated in the CRC's community planning process with the hope and expectation that we would be allowed to protect and implement the values of the Hayden Island Plan. We do not want to see key elements of our vision trampled.

Thank you,

Brad Howton

Chair – Hayden Island Plan Steering Committee
Member of several CRC work groups, including the Portland Working Group

Copies, via email:
Nancy Boyd
Tina Kotek
Andy Cotugno
Catherine Ciarlo
John Gillam
Barry Manning

the LPA by project partners in July 2008, the CRC project team has been working to minimize the potential property impacts associated with the project's improvements. Though the project team has been working to stay within the existing right-of-way, some property acquisitions will be unavoidable. Property owners will receive just compensation for the estimated value of land and improvements acquired and for other impacts that result in a measurable loss of value to the remaining property.

The future of the Hayden Island Plan and of the island itself will be facilitated by the project. The loss of commercial businesses is regrettable, and the project will continue to try to avoid these displacements. However, the project's multi-million dollar improvements on the island will more than offset these losses. The Hayden Island Plan relies on improved Interstate access and the extension of light rail to the island. The LPA represents the locally preferred alternative to achieve these ends, and has thus been supported by ODOT, TriMet, Metro, and the City of Portland.

Hines, Maurice

From: Lenny Anderson [sitma@teleport.com]
Sent: Wednesday, October 19, 2011 9:16 AM
To: Hines, Maurice
Subject: Re: Bi-State Citizen Advisory Committee

Maurice,

A-001-001 As you may know I served on the Governors' I-5 Task Force, 1999-2002. As a member of that group I observed first hand the failure of ODOT/WSDOT to honor their promises regarding an arterial bridge options inclusion in the Draft EIS.

A-001-002 All that has followed has been a multi million dollar public relations campaign to saddle this region with a massive project
A-001-003 it neither needs or can afford. Please remove my name from your list of potential CAC members.

Lenny Anderson

Lenny Anderson
Executive Director
Swan Island Business Assoc.
4567 N. Channel Ave.
Portland, OR 97217
503.745.6563
www.swanislandtma.org

----- Original Message -----
From: Hines, Maurice
To: sitma@teleport.com
Sent: Tuesday, October 18, 2011 11:58 AM
Subject: CRC: Bi-State Citizen Advisory Committee

Lenny,

Recently, I left a voice mail for you regarding the Columbia River Crossing's interest in forming a new bi-state citizen advisory committee to provide input on corridor and local improvements and serve as a liaison to local neighborhoods.

The bi-state committee will include about 30 members, including 12 to15 people from each state who reflect diverse interests throughout the project area. Members will serve for one or two year terms. The full committee will meet one or two times a year. Vancouver and Portland
subcommittees, both composed of bi-state committee members, will each meet 10 to 12 times
per year.

Completed applications for the Columbia River Crossing Bi-State Citizen Advisory Committee are due as soon as possible.

An application form and additional information are available online at http://www.columbiarivercrossing.com/ProjectPartners/BSAC.aspx. Email your completed application to feedback@columbiarivercrossing.org or submit it by mail to 700 Washington Street, Suite 300, Vancouver, WA 98660.

If you have any further questions about the committee, you may contact Karyn Criswell at the CRC project office, 360-816-2170 or via email at criswellk@columbiarivercrossing.org.

Thank you.

Maurice

A-001-001

Many different options for addressing the project's Purpose and Need were evaluated in a screening process prior to the development and evaluation of the alternatives in the DEIS. Options eliminated through the screening process included a new corridor crossing over the Columbia River (in addition to I-5 and I-205), an arterial crossing between Hayden Island and downtown Vancouver, a tunnel under the Columbia River, and various modes of transit other than light rail and bus rapid transit. Section 2.5 of the DEIS explains that a third corridor--arterial crossing of the Columbia River--and several transit modes evaluated in screening were dropped from further consideration because they did not meet the Purpose and Need. For a general description of the screening process, see Chapter 2 (Section 2.7) of the FEIS. It should be noted that every proposal received from the public was considered, and many of the proposals that were dropped from further consideration included elements that helped shape the alternatives in the DEIS.

A-001-002

The CRC project has conducted extensive outreach throughout the NEPA process. The intent of the outreach is to disseminate information about the project and to give opportunities for public input and comment.

A-001-003

The Purpose and Need is based on extensive analysis of the existing and projected transportation problems in the I-5 CRC corridor, and reflects extensive feedback from the public and stakeholder groups. This includes analysis and input during the CRC study as well as the I-5 Transportation and Trade Partnership Study and Strategic Plan that preceded CRC. The LPA represents the design most likely to meet the purpose and need for the project. The LPA is supported by the City of Vancouver and Portland, TriMet and C-TRAN, Metro and SW Washington Regional Transportation Council, Washington and Oregon

Departments of Transportation, and the Federal Highway Administration and Federal Transit Administration.

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October 18, 2011

RECEIVED
OCT 20 2011
Columbia River Crossing

Columbia River Crossing
c/o Heather Wills
CRC Environmental Manager
700 Washington Street, Suite 300
Vancouver, WA 98660

Dear Columbia Crossing project;

A-002-001 Thank you for providing us with a copy of the Columbia River Crossing Final Environmental Impact Study.

We are pleased to see that the preferred alternative includes a new bridge, light rail, and improved bicycle and pedestrian facilities, as we believe these will all best serve the transportation needs of visitors to our city and region.

We do have some concerns and recommendations on the tolling system with regards to visitors who may not have transponders. We are very concerned with the final impression of Oregon that will be left with visitors if they receive a license-plate recognition bill in the mail, especially with a processing fee added to the amount that other users pay for crossing the bridge. This seems to punish visitors who may have no other reason to have a transponder in their car.

Visitors to the Portland region directly spend $3.8 billion per year our area. That spending creates 28,000 jobs, and supports many businesses and attractions that Oregon residents also enjoy. It is important that these visitors have a positive experience here—this increases the chance that they will come back for repeat visits, and will encourage friends and relatives to visit Portland as well.

For this reason, we strongly recommend that options for pre-payment and/or on-site payment be integrated into the tolling process design. We understand that payment booths may not be possible; however we have heard suggestions for online pre-payment, rest area or convenience store kiosk payment options and mobile phone applications. We believe that technological advances over the next few years should make it plausible and reasonable to provide options that are more comfortable for our visitors than a bill in the mail with an added fee.

It is also important that these payment options be obvious and well publicized.

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Tolling policies, including the start date, are still to be determined, but we know that the toll collection process will be electronic –without toll booths to slow drivers down. Electronic systems are currently in use in Washington, and at locations across the country and internationally. In the future, drivers traveling over the I-5 bridge with a transponder will be able to set-up tolling accounts with cash, or to deduct funds from a checking or credit account. Similar to the Washington system, CRC assumes that users without a transponder will be able to pre- or post-pay for their trip. Payment will be possible online, over the phone, or in person at locations still to be determined. As noted in your comment, technology will continue to progress over the next years. The system utilized by CRC will take full advantage of the latest innovations.

Prior to implementation, widespread and visible outreach and notification will occur about the tolling system and options available for drivers. Signage along the corridor, in Oregon and Washington, will be in place once the tolling system is in place.

Mr. Miller has been added to our email update list and will continue to receive news and information from the project on a monthly basis.

A-002-001 Please keep these recommendations in your consideration as you move forward. We understand that there are two possible timelines for development of tolling plans depending on whether tolling starts during construction or not until at least one span is opened. In either case, we would like to remain engaged in this discussion and would appreciate continued information about the planning process.

Thank you for the opportunity to comment on the FEIS.

Sincerely,

Jeff Miller
President & CEO

cc Jason Tell, ODOT Region 1
Andy Cotugno, Metro

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A-001-001 A-001-002 A-001-003

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Jeff Miller
President & CEO

cc Jason Tell, ODOT Region 1
Andy Cotugno, Metro

TOM BUCHELE
Managing Attorney & Clinical Professor

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Federal Transit Administration
James Saxton, Transportation Program Specialist
Region 10 915 Second Avenue, Suite 3142
Seattle, WA 98174
james.saxton@dot.gov

September 29, 2011

Sent via Electronic and Regular Mail

Ms. Wills, Mr. McAvoy and Mr. Saxton:

O-001-001 The Pacific Environmental Advocacy Center (PEAC) submits this request on behalf of the following organizations: Northwest Environmental Defense Center (NEDC), Coalition for a Livable Future and Rosemere Neighborhood Association. PEAC requests a 60-day extension of the deadline for public comments on the Final Environmental Impact Statement (FEIS) of the Columbia River Crossing (CRC). The current 30-day comment period is wholly insufficient for the public to analyze the massive FEIS, which is a significantly different from the DEIS.

O-001-001

FTA and FHWA sent a formal reply to PEAC's request, declining to extend the deadline for public comments on the FEIS.

O-001-001

To illustrate some changes, both the "Ecosystems" and the "Air Quality" sections of the FEIS are significantly different from the DEIS. The "Ecosystems" section in the FEIS contains more than 400 pages of new material compared to DEIS. Furthermore, the FEIS includes a Biological Opinion located at Appendix N which was not available with the DEIS. The "Air Quality" section also contains significant changes from the DEIS. Specifically, the FEIS introduces new points of discussion that were not presented in the DEIS (e.g. the Ruby Junction Maintenance facility). The FEIS also significantly expands both subsection 3.10.4 (Temporary Effects) and the "Temporary Effects" portion under subsection section 3.10.5 (Mitigation or Compensation) of the "Air Quality" section. A 90-day comment period would ensure that public participation in the National Environmental Policy Act (NEPA) process is meaningful and not merely a procedural formality for approving the CRC.

CRC circulated the DEIS in May of 2008. Three years and four months later, CRC then released the FEIS. In this time, CRC illegally did not supplement the draft EIS. A 90-day comment period is imperative considering the substantial changes from the DEIS to the FEIS. If supplements had been provided to allow the public to analyze new materials in a timely fashion, perhaps a 30-day final comment period would be sufficient. Where, as here, however, the FEIS is significantly different from the DEIS, a 90-day comment period is essential for meaningful public participation.

O-001-002

Concerned citizens and implicated agencies cannot adequately participate in the NEPA process if they are only given 30 days to analyze and comment on the thousands of pages of the highly technical document. Meaningful public participation is central to the NEPA process. NEPA requires the sponsoring agencies to "make diligent efforts to involve the public in preparing and implementing their NEPA procedures." 40 CFR § 1506.6(a). The Federal Highway Administration's (FHWA) NEPA regulations further reflect the need for genuine public input, stating FHWA's policy that "[p]ublic involvement and a systematic interdisciplinary approach be essential parts of the development process for proposed actions." 23 CFR § 771.105(c). FHWA cannot seriously assert that a 30-day comment period meets its requirement to make public input an essential part of the finalizing the FEIS.

O-001-003

While CRC's CD containing the FEIS also contains responses to comments it received on the DEIS, that fact alone does not demonstrate that public concerns were adequately addressed. To fully complete the NEPA process, CRC must "provide a 'meaningful reference' to all responsible opposing viewpoints concerning the agency's proposed decision;" see *State of California v. Block*, 690 F.2d 753 at 773 (1982), see also 40 CFR § 1503.4. For the public to intelligently review over 1,600 public comments from the DEIS and CRC's responses to those comments within 30 days places an unreasonable burden on the interested public's efforts to ensure that CRC has satisfied the relevant regulations.

O-001-002

The project has been soliciting public input and providing public information throughout the process of developing the FEIS. The FEIS describes specific outreach and involvement efforts that occurred and how they have influenced the project. The locally preferred alternative was selected in the summer of 2008 and has been the subject of extensive public and agency coordination and input since then. The findings and conclusions in the FEIS are not fundamentally different from the DEIS. Many of the changes in the FEIS were in response to input received from citizens and other stakeholders. While the FEIS is not subject to a formal public comment period as the DEIS is, FTA and FHWA solicited comments on the FEIS prior to finalizing the NEPA process.

O-001-003

Please see responses above.

Whether or not citizens read the entire FEIS, all DEIS comments, and all responses to DEIS comments is not really the test for determining whether or not public concerns were adequately addressed. As noted in the responses above, there has been extensive public outreach and input during the preparation of the FEIS, many of the findings were released to the public before the FEIS was published, and many of the meaningful refinements since the DEIS have been the result of public outreach.

In addition, each person who commented on the DEIS was provided reasonable opportunity to review the response to his or her comments, as well access to any other comments and responses. For those who did not wish to review all 1,600 comments, the FEIS provided a summary of the most common comments received and responses to them (Chapter 6--Public Input on the Draft EIS).

O-001-004

FHWA and the Federal Transit Authority (FTA) have the authority to extend the commenting period beyond the 30-day public comment period. 40 CFR §§ 1506.10 (d), 23 CFR § 771.125; 23 CFR § 771.127(a) The circumstances of the FEIS makes such an extension particularly appropriate here. NEPA implementing regulations stipulate that in determining the appropriate time limit for a comment period, an agency may consider several factors, including: the potential for environmental harm, 40 CFR § 1501.8(b)(1)(i), the size of the proposed action, 40 CFR § 1501.8(b)(1)(ii), the number of persons and agencies affected, 40 CFR § 1501.8(b)(1)(v), and the degree to which the action is controversial, 40 CFR § 1501.8(b)(1)(vii). The CRC implicates each of these factors.

The CRC is a major transportation project with the potential to cause significant environmental harm to the water quality and ecosystems of the Columbia River, a vital habitat for fish species protected under the Endangered Species Act; the air quality of the Portland metropolitan area; wetland areas; environmental justice communities; local parks and green spaces threatened by urban sprawl; and historic preservation areas. If FHWA does not extend the comment period, citizens will not be able to consider all environmental impacts and will only be able to superficially analyze even the most apparent issues. Providing an extra 60 days is a minor delay given the CRC's potential environmental harms.

The CRC is one of the largest public works project to ever affect this region, and thus warrants a commensurately substantial comment period. The minimum estimated cost of $3.1 billion will tap into a significant portion of the region's transportation budget. This lengthy construction project will have significant impacts immediately and long into the future in two states, two cities and a major regional waterway. The invested parties bearing the brunt of these impacts deserve a legitimate opportunity to carefully analyze the changes from the DEIS to intelligently comment on the FEIS.

Further, the comment period the comment should be extended because the project directly affects millions of citizens and dozens of local, state and regional agencies. CRC has already included twelve local, regional and national agencies in addition to nine federally recognized and non-federally recognized tribes on this project. More than 12,000 community members have engaged in the CRC process since 1995. While the involvement of these agencies, tribes and citizens in the initial planning stages has been beneficial, the public still needs adequate time to comment on the FEIS after the September 23, 2011 publication.

Finally, the CRC is a controversial project that is at the forefront of public attention in the Portland/Vancouver area. Several affected groups have developed passionate and diverse opinions about the project that must not be stifled. The stakes of this project, and thus of the FEIS, are high and CRC needs to allow sufficient time to consider the issues presented by those affected. With groups positioned on all sides of the proposal, some positions will inevitably lose

O-001-004

The fundamental finding of impacts did not change meaningfully between the DEIS and FEIS. Both documents disclose that the project will not cause significant harm to water quality, ecosystems, air quality, wetlands, EJ communities, or induced sprawl. The project would have significant impacts to parks and historic resources, although the impacts were reduced through project refinements following the DEIS. This information was the subject of public outreach, and the revisions were made in part to reflect public and agency input during the preparation of the FEIS.

FTA and FHWA previously sent a formal reply to PEAC's request regarding the comment period.

O-001-004

to others. When this happens, CRC will face scrutiny by unsatisfied parties that feel the participating agencies did not provide them an opportunity to meaningfully comment on their concerns. CRC should respect the controversial nature of the project by allowing for a more appropriate time period to explore all aspects of it. The current 30-day comment period will limit commenting parties to superficial analyses, heightening tensions and unjustly serving all.

In short, all parties involved will benefit from an extension of the public commenting period, and the project will not be adversely affected by an extension. Therefore, CRC should grant an extension of the public comment deadline until December 23, 2011.

Sincerely,



Tom Buchele
Managing Attorney & Clinical Professor
Pacific Environmental Advocacy Center (PEAC) at Lewis and Clark Law School
10015 SW Terwilliger Blvd.
Portland, OR 97219
T. 503-768-6736 F. 503-768-6642
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On behalf of:

Northwest Environmental Defense Center (NEDC), Coalition for a Livable Future and Rosemere Neighborhood Association.

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Heather Wills, CRC Environmental Manager
700 Washington Street, Suite 300
Vancouver, WA 98660

VIA CERTIFIED MAIL (No. 7009 3410 0002 0829 4472) and EMAIL (feedback@columbiarivercrossing.org)

RE: Comments on September 2011 Final Environmental Impact Statement for the Interstate 5 Columbia Crossing Project

Introduction

O-002-001

The Pacific Environmental Advocacy Center ("PEAC") submits the following comments on behalf of its clients Coalition for a Livable Future, the Northeast Coalition of Neighborhoods, the Rosemere Neighborhood Association, Northwest Environmental Defense Center, Columbia Riverkeeper, the Portland Audubon Society, Oregon Public Health Institute, Upstream Public Health, and Association of Oregon Rail and Trail Advocates. These comments will refer to these groups collectively as "PEAC" but, to be clear, "PEAC" is in fact representing the concerns and views of a broad and diverse coalition of groups.

The voluminous Columbia River Crossing ("CRC") Final Environmental Impact Statement ("FEIS"), approved by the Federal Highway Administration ("FHWA") and the Federal Transit Administration ("FTA") (collectively "the Federal agencies"), purports to analyze and disclose the impacts of what can best be described as a massive monument to the mid-twentieth century motor vehicle mentality. The CRC's Locally Preferred Alternative

O-002-001

Each of the points in the introduction is expanded upon in the later comments in this letter. Several key points in this letter's introduction are:

1. The LPA has too many environmental impacts and is not sustainable;
2. There should have been a Supplemental DEIS;
3. Traffic projections are wrong; and
4. Alternatives with fewer impacts weren't considered, and alternatives were dismissed with just a checklist.

The following provides responses to the issues listed above. Additional information can be found in the responses to the subsequent and more detailed comments in this letter.

The LPA's and other alternatives' environmental impacts are described in the FEIS and detailed in the CRC FEIS technical reports and other project reports as referenced in the FEIS. Considerable work and coordination went into refining designs in order to avoid impacts where possible, minimize those that could not be avoided, and mitigate the remaining impacts where practicable. Chapter 2 of the FEIS describes how alternatives evolved and were refined over time. Chapter 3 describes the impacts.

See responses below regarding sustainability, GHG emission reductions, water quality improvements, and the minimization of and mitigation for impacts to fish.

Regarding a supplemental DEIS, new information and design refinements completed after the DEIS were considered and reviewed by FTA and FHWA, consistent with 40 CFR 1502.9(c)(1) and 23 CFR 771.130(a). See the discussion on page 2-86 and the documentation in Appendix O (NEPA Determinations) of the FEIS. None of the project

O-002-001

("LPA") sprawls across north Portland, Hayden Island, the Columbia River, and into Vancouver, Washington, dwarfing the bridges it intends to replace, adding substantial new motor vehicle capacity and multiple new or enlarged highway interchanges, covering many additional acres of land with new impermeable surfaces, and creating a new, much larger obstacle that migrating salmon will have to maneuver under and around. Adding a light rail line and "improved" bicycle facilities is simply putting green lipstick on an environmental pig. Those "add-ons" do not change the fact that this project is, and from the beginning has been viewed by its proponents as, primarily a major highway expansion project. On its face the CRC certainly looks like the exact opposite of what many individuals, groups and governmental bodies in Oregon and Washington have been trying to promote, encourage and legally require in terms of sustainable development, sustainable transportation solutions, actual reductions in water pollution and air pollution (including greenhouse gas emissions) and real improvements in salmon habitat.



Model on Display at CRC Headquarters, October 2011

refinements made after the DEIS would result in new significant environmental impacts that were not previously evaluated in the DEIS. New information and design refinements were shared with the public, and much of the work was in response to public and agency input. There is no need to prepare a supplemental DEIS. See responses to PEAC's specific comments below.

The traffic forecasting methodology used for the CRC project is based on regional growth plans and uses the same models used for all transportation projects undertaken for the Portland-Vancouver region. CRC did not assume uniform growth of traffic from year to year. Estimating future traffic volumes requires a dynamic model with inputs on land use, socioeconomics, trip origins and destinations, and travel mode and route choice. The traffic forecasts used for the CRC project are based on the regional transportation forecasting model developed and operated by Metro and the Southwest Washington Regional Transportation Council (RTC). A multi-jurisdictional team, including all of our local partners, has reviewed CRC traffic modeling forecasts. In addition, an expert review panel composed of national experts in the field of traffic modeling conducted an independent analysis in 2008 and validated the methods and results. The panel found that the travel demand model used for CRC is an advanced trip-based tool and that it was a valid tool for a project of this type. See further discussion below and in responses to letter P-047.

See also the January 21, 2011 memorandum from ODOT Director Matt Garrett to members of the Oregon legislature. This memo responds to comments that Mr. Chris Gerard sent to members of the Oregon legislature in October 2010. The memo is located on the CRC website at:
http://www.columbiarivercrossing.org/FileLibrary/Memorandums/PlaidPantry_Response.pdf

O-002-001

But not to worry, throughout the FEIS the public is told that the LPA is the best, "sustainable" way to address future transportation needs in the "Bridge Influence Area" ("BIA"), and will supposedly have much lower environmental impacts on most resources and, at worst, essentially the same adverse impacts on significant resources like the region's threatened salmonid species. Such counter-intuitive conclusions should, consistent with the specific requirements of the National Environmental Policy Act, 42 U.S.C. § 4321, *et seq*., and its implementing regulations, 40 C.F.R. §§ 1500.1-1508.28, ("NEPA") be supported by extensive and well-documented analysis using the best available information. The Draft Environmental Impact Statement ("DEIS") failed miserably in that regard as PEAC's DEIS comments, and the comments of many others, documented. More than three years later the FEIS attempts to address those failings in the DEIS by adding the "refined" LPA, and substantial additional analysis, including, in particular, analysis regarding impacts on salmon. There are at least two problems with this "cure" for the inadequate DEIS.

First, as explained below, it is illegal under NEPA to issue a cursory DEIS for public scrutiny and to then, more than three years later, dump much of the detailed analysis that NEPA requires of the DEIS into the FEIS. Such a process does not give the public a meaningful opportunity to scrutinize and comment on the CRC's actual analysis and reasoning regarding their assertions of insignificant or improved impacts. Curiously, although the CRC spent millions of dollars on new and updated analyses, it refused to update the DEIS's incorrect and inflated traffic projections even though new, contradictory traffic information was available and consultants hired by the state of Oregon both concluded that the DEIS's traffic projections were significantly overstated.

Almost all of the other descriptions, quantifications and analyses of environmental impacts depend upon the reliability of CRC's traffic projections. Thus, CRC's refusal to update the

A wide variety of components, proposals, and other ideas were proposed and considered. Proposals that did not meet the fundamental needs of the project were not reasonable and did not need be further evaluated. The AORTA alternative had many elements in common with ideas that had been previously evaluated--and dropped--prior to the DEIS because they could not meet the purpose and need and/or had significant feasibility problems. The AORTA alternative did not correct these deficiencies. The "Straight Alternative" emerged after the DEIS and had some concepts similar to previously evaluated ideas, as well as some unique elements. The Bridge Expert Review Panel reviewed the "Straight Alternative" and did not recommend that CRC advance it. The CRC staff also reviewed it and found that it had substantial performance deficiencies, additional constructability issues, and additional impacts, as outlined in an August 25, 2011 memorandum from Frank Green and Casey Liles to Nancy Boyd, CRC Project Director. See additional discussion in the following responses to PEAC comments. The checklist in Appendix D (Early Screening of Project Components and Evaluation of Alternatives Packages) of the FEIS summarizes the results of an initial screening test of a long list of proposed ideas for the river crossing and for transit. This pass/fail test eliminated proposed ideas that could not adequately address the relevant elements of the purpose and need for the proposed action. The remaining ideas (components) were passed forward to the next evaluation step, as discussed in Chapter 2 of the FEIS.

O-002-001

DEIS information that most clearly needed to be updated ignores NEPA's requirement that an EIS include "high quality" information, and causes many of their conclusions and assertions in the FEIS to be arbitrary and capricious. This combination of a cursory DEIS, significant new information regarding traffic forecasts, the significant new analyses added to the FEIS and the substantial changes to the LPA combine to trigger the federal agencies' obligation under 40 C.F.R. § 1502.9(a) and (c) to prepare a supplemental draft EIS so that the public will have a meaningful opportunity to scrutinize and comment on all of these changes and new information. Rather than doing that, the CRC actually went out of its way to limit its consideration of alternatives and changes to the project to only those that arguably would not trigger the need for an SDEIS. Those efforts violated both the letter and spirit of NEPA generally and 40 C.F.R. §§ 1500.2, 1502.9 and 1502.14, specifically.

Second, despite taking more than three years to prepare the FEIS, that NEPA document still fails to adequately address many of this massive project's impacts and still fails to satisfy many of NEPA's very specific requirements. Despite numerous comments criticizing the CRC's overly narrow definition of the project's purpose and need, that portion of the DEIS remains essentially unchanged in the FEIS, in violation of 40 C.F.R. §§ 1502.3 and 1502.14. That unreasonably narrow statement of purpose and need continues, in the FEIS, to lead to an impermissibly narrow range of alternatives.

The FEIS considers only alternatives that focus on highway capacity expansion and still fails to consider any alternative that attempts to address the area's transportation needs by focusing on things other than adding additional traffic lanes over the Columbia River. In DEIS comments, the CRC was presented with multiple viable alternatives, and has continued to receive viable alternative bridge proposals during the more than three years between the DEIS and FEIS,

O-002-001

including at least one that would have addressed even the CRC's overly narrow purpose and need statement without building a sprawling replacement bridge. A vigorous comparison of alternatives is the heart of an EIS and the public was entitled to see and compare alternatives that approached the transportation needs of the area in different ways. Instead the CRC unilaterally made judgment calls about what tradeoffs were appropriate and what impacts were acceptable or necessary and limited the FEIS's comparison to one between no action whatsoever and spending billions of dollars on expanding highway capacity.

Indeed one tradeoff that was not disclosed in the DEIS, but that became apparent when the DEIS bridge design was reexamined, was the CRC's decision not to even consider bridge design alternatives that may have significantly decreased impacts on salmon. The CRC had before it bridge designs that would have required far fewer in water piers and a much narrower "footprint" over the river. The CRC, however, failed to even disclose such potentially beneficial designs in the DEIS and refused to include them in the FEIS or a supplemental DEIS, even after they were put forth by an independent review panel as viable options. This failure to consider such viable, less environmentally harmful options violates 40 C.F.R. §§ 1500.2(e), 1502.14, and the federal agencies' endangered species conservation obligations under 16 U.S.C. § 1536(a)(1).

The FEIS also fails to adequately and properly consider the likely adverse impacts to many of the regions resources, in part because it often improperly limits analysis to the BIA even though the potential adverse impacts from this proposal will clearly cascade far beyond that artificial boundary. In terms of the duty to evaluate cumulative impacts, the FEIS merely contains a series of conclusory assertions regarding the supposed absence of such impacts. But conclusory and unsupported assertions do not satisfy NEPA's requirement for a detailed statement. *Trout Unlimited v. Morton,* 509 F.2d 1276, 1284 (9th Cir. 1974). The analysis of

O-002-001

impacts to water resources, including both surface and groundwater, is still quite incomplete and fails to support many of its assertions of no or limited impacts. That is simply unacceptable for a proposal that will create at least 43 acres of new impermeable surfaces and their associated storm water runoff. The air analysis in the FEIS was significantly revised, but in part because of its invalid traffic forecasts and assumptions, still fails to address many of the localized impacts to the neighborhoods along the I-5 corridor including in particular impacts from hazardous air pollutants. The traffic forecasts in the FEIS, as already noted, are hopelessly flawed and those flaws infect the related and new tolling and financial analysis. Rather than address the likelihood of induced growth, as 40 C.F.R. § 1508.8(b) requires, the FEIS includes a new report "explaining' why there will be no induced growth from the LPA's added highway capacity. The FEIS also fails to adequately address human health issues and improperly refuses to treat neighborhoods in Vancouver as environmental justice communities.

Finally, and perhaps most significantly, the FEIS fails to acknowledge and independently analyze all of the adverse impacts that the LPA and other action alternatives would have on salmon, specifically, and aquatic resources generally. The FEIS's analysis of these important issues is significantly expanded from the DEIS, and there is no excuse whatsoever for why all of this new analysis was not contained in the DEIS, as is strongly encouraged by 40 C.F.R. § 1502.25, and required by 40 C.F.R. § 1502.9(a). But this new analysis, partly contained in the Biological Opinion ("BiOp") prepared by the National Marine Fisheries Service ("NMFS"), also completely misses the mark by failing to address all impacts on salmon, including cumulative impacts from this huge project and the many other projects on the Columbia and Willamette Rivers that are already adversely affecting salmon. Indeed a complete analysis is especially important when the CRC is seeking to kill and harass salmon in the Columbia well outside the

O-002-001

standard in-water work window that has been put in place specifically to prevent such adverse effects. The federal agencies' obligations under NEPA and under Section 7(a)(1) and 7(a)(2) of the ESA clearly requires a much broader and more comprehensive analysis of all adverse impacts on salmon than is contained in the FEIS or the BiOp.

Overall it is remarkable how much incomplete and missing analysis is found when the public reviews this FEIS, which has already cost Oregon and Washington taxpayers more than $130 million. This would be Oregon's largest public works project, and its taxpayers and the taxpayers of Washington are entitled to a much more thorough and complete analysis, a true comparison of all reasonable alternatives that "sharply defines the issues and provide[s] a clear basis of choice among options" (40 C.F.R. § 1502.14), and a meaningful opportunity to review and comment on all of those things in a supplemental DEIS.[1]

Failure to Prepare a Supplemental DEIS

O-002-002

The CRC staff's and the federal agencies' explanations for why a supplemental DEIS is not required ignore and misconstrue numerous regulations and statutes. More importantly their arguments focus on only one of the several factors that combine to make a supplemental DEIS the only possible course that complies with both the specific language of the applicable laws and their spirit.

NEPA's disclosure goals are two-fold: (1) to insure that the agency has carefully and fully contemplated the environmental effects of its action, and (2) "to insure that the public has sufficient information to challenge the agency." *Idaho Sporting Congress v. Thomas*, 137 F.3d

[1] When responding to PEAC's FOIA requests the Federal agencies improperly withheld a large number of documents. PEAC administratively appealed that decision on July 5, 2011, and the Federal agencies have not yet responded to that appeal. *See* NEPA Process/FOIA Appeals Materials Folder. When PEAC obtains the improperly withheld documents it reserves the right to submit additional comments based on those documents.

O-002-002

The new information and design refinements completed after the DEIS were the types of changes commonly made between a draft and final EIS. The revisions to the alternatives reflected community and agency input intended primarily to reduce impacts, lower costs, or further advance the design in order to better identify appropriate mitigation and to comply with other environmental regulations. These refinements have not significantly changed the alternatives that were included in the DEIS nor have they resulted in any meaningful changes in the analytical findings from the DEIS.

These refinements were considered and reviewed by FTA and FHWA, consistent with 40 CFR 1502.9(c)(1) and 23 CFR 771.130(a). See the discussion on page 2-86 and the documentation in Appendix O (NEPA Determinations) of the FEIS. None of the project refinements would result in new significant environmental impacts that were not previously evaluated in the DEIS. New information and design refinements were shared with the public, and many of the project refinements were made in response to public and agency input. See responses to PEAC's specific comments below. See responses to later comments in this letter that expand upon the points made in this comment.

O-002-002

1146, 1151 (9th Cir. 1998) (overruled on other grounds by *The Lands Council v. McNair,* 537 F.3d 981 (9th Cir. 2008); Robertson *v. Methow Valley Citizens Council,* 490 U.S. 332, 349 (1989); *see also* 40 C.F.R. §§ 1500.1 and 1500.2. The CRC's refusal to prepare a SDEIS implicates both of those goals, but it falls most heavily on NEPA's requirement that the analysis be subject to vigorous and meaningful public scrutiny. NEPA's public scrutiny requirement is most directly implemented by the CEQ regulations requiring: (1) that agencies first prepare a draft EIS that "fulfill[s] and satisf[ies] to the fullest extent possible the requirements established for final statements," 40 C.F.R. § 1502.9(a); (2) that federal agencies must solicit public comment on that statement, 40 C.F.R. § 1503.1; and (3) that agencies must respond to those comments from the public (in its FEIS) and if necessary make changes to the DEIS. 40 C.F.R. § 1503.4. There is no requirement that agencies must respond to comments on an FEIS and because it is final, changes to an FEIS in response to comments are not possible. Thus the only meaningful opportunity for the public to scrutinize and challenge an agency's NEPA analysis is when the public reviews the analysis put forth in the DEIS.

Contrary to repeated assertions by CRC staff at public hearings, there is absolutely nothing in NEPA, CEQ's regulations, or FHWA's NEPA regulations, that allows, or even suggests, that a DEIS can contain less rigorous or detailed analysis than an FEIS. Moreover there is also nothing in those regulations that says an agency can wait until after it publishes a DEIS to prepare the analyses necessary to support or explain its conclusions regarding all of the impacts that it must consider under NEPA. In fact 40 C.F.R § 1502.25 requires that, "to the fullest extent possible" the analysis required by statutes like the ESA shall be prepared concurrently with and integrated into the draft EIS. Indeed, if a draft EIS could be issued quickly and initially without all of the necessary analysis, and the agency could then take its time to add all of the detail into the FEIS,

O-002-002

there would be no need for a regulation like 23 C.F.R. § 771.129, which requires a written evaluation of the DEIS when the agency takes more than three years to issue the FEIS. If it was standard practice to produce a cursory DEIS and to do all the required analysis later and include it in the FEIS, it would not matter how much time had passed between the publication of a DEIS and the publication of the FEIS.

Finally, although the Federal Agencies have cited 23 U.S.C. §139(f)(4)(D) to support their argument that detailed analysis of the LPA can wait until the FEIS, that statute in fact says no such thing. It does say that an agency can decide to provide more detail regarding a LPA, but an LPA usually should be identified in the DEIS, *see* 40 C.F.R. § 1502.14(e), and any additional detail included in the DEIS. More specifically, there is nothing in NEPA or any other applicable law that allows the CRC to issue a DEIS with technical reports that cite nothing specifically in support of its "analysis" and to then include revised technical reports with the FEIS that suddenly include the citations required by 40 C.F.R. § 1502.24. This is not simply adding "detail" or "refinements" regarding the LPA. This is suddenly including the very basic analysis and support for an agency's assertions, assumptions and conclusions only in a FEIS and thereby avoiding any real public scrutiny of that essential analysis.

There is no reason most if not all of this new analysis could not have been included in the DEIS. The CRC staff and Federal Agencies simply chose not to include it and to issue a woefully incomplete DEIS. Indeed the fact that it has taken the CRC staff more than three years to issue the FEIS clearly shows that they decided to issue a cursory DEIS, that is really only a very lengthy scoping document, and to then prepare some of the detailed supporting analysis that NEPA requires. But NEPA does not allow them to make such an anti-democratic choice that essentially cuts the public out of the analytical processes underlying the FEIS. Under NEPA you

O-002-002

cannot let your DEIS horse out the barn for public scrutiny unless it is pulling a fully-loaded and detailed analytical cart.

As was explained in PEAC's DEIS comments, the DEIS was a completely inadequate document lacking much basic and essential analysis to support its repeated assertions of no or limited impacts. What analysis there was often lacked supporting citations, even in its so-called "technical reports." It was impossible for the public to meaningfully scrutinize the CRC staff's assertions and conclusions without this underlying analysis and support. Thus, under 40 C.F.R. § 1502.9(a), a supplemental DEIS was necessary.

The CRC has now done some of the necessary, detailed and supporting analysis for its conclusions and assertions. For example it has prepared a more detailed tolling, financial and air analysis. It has prepared a Biological Assessment ("BA") regarding impacts on ESA species and MSA fisheries, it has added more detail to the FEIS and its appendices regarding impacts on species like salmon and it has consulted with NMFS regarding that analysis and NMFS has issued a BiOp. This new analysis, for the first time, discloses that the standard in-water work window designed to protect salmon will be suspended for much of the time the new proposed bridge is under construction. (This new disclosure and analysis by itself is enough to justify a Supplemental DEIS.) CRC has prepared a completely new and lengthy Metroscope 2010 modeling report that supposedly supports its assertions of no induced growth. A sustainability strategy has suddenly appeared as an appendix to the FEIS. FEIS Appendix C. New bridge designs were identified and evaluated in a lengthy report. *See* BRP Report, Non-NEPA Reports Folder. The CRC staff also made numerous changes to the DEIS alternatives when developing the LPA in the FEIS. Additional detail and changes from the DEIS are set forth in FEIS Changes, contained in the NEPA Process Folder. These are all just examples of the many

O-002-002

changes to the FEIS, and PEAC has simply not had enough time during the very limited FEIS 30-day comment period to identify and list all of those changes.

CRC has argued repeatedly at public hearings that all these changes are simply refinements to and added detail regarding the LPA and that such changes are normal between the DEIS and FEIS.[2] The Federal Agencies have prepared several "NEPA Determinations" finding that some of the design changes in fact do not have "significant impacts," and thus do not trigger the need for a SDEIS under section 1502.9(c).[3] There are at least two problems with these arguments and findings. First they ignore the fact that much of the newly added analysis and information has absolutely nothing to do with the specific changes made to the LPA. The DEIS was required to have a detailed analysis regarding, among other things, tolling, finances, induced growth, air impacts and impacts on threatened salmon. The delay in providing that detailed analysis (which in any case is still quite inadequate) has nothing to do with changes made to the LPA. Section 1502.25 required that this detailed analysis regarding threatened and endangered species, including the BA and BiOp, must, "to the fullest extent possible," be prepared and included in the DEIS. PEAC sees no valid explanation for putting off all this ESA and detailed NEPA analysis until the FEIS. Indeed the real explanation for this delayed analysis appears to be the CRC's choice to put out a cursory DEIS before sufficient planning and analysis had been done regarding the LPA and mitigation measures.

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[2] Far from being normal, these changes to the DEIS action alternatives were necessitated in part by a clear legal error by the CRC regarding what alternatives must be presented and evaluated in the DEIS. Then CRC Executive Director Brandman repeatedly stated, in response to criticism regarding the size and cost of the DEIS replacement bridge alternatives, that NEPA regulations required the CRC to develop DEIS alternatives without regard to cost. Brandman e-mail in NEPA Process Exhibits Folder, and Oregonian Traffic Estimates in Media Folder. There is, of course, no such regulation.

[3] Although these evaluations are prominently included with the FEIS, Appendix O, PEAC has not found the specific certification required by 23 C.F.R. § 771.129(a).

O-002-002

Second, the Federal Agencies' reports examine the various changes in isolation and do not really consider the cumulative impacts of all the changes and new information. When considered together, and in light of the incomplete and unsupported DEIS, all of these changes and new information clearly trigger the need for a SDEIS under 40 23 C.F.R § 1502.9(c) and 23 C.F.R § 771.130.

The Federal Agencies' decisions not to require a SDEIS also ignore new, very significant information regarding environmental impacts that most certainly had to be evaluated in a SDEIS. First, the new traffic data and expert evaluations criticizing the DEIS's traffic estimates show very real, significant effects that the FEIS simply ignores. *See generally*, INDIRECT IMPACTS—INDUCED GROWTH, TRAFFIC PROJECTIONS AND FINANCIAL ANALYSIS Exhibits Folder. By over-estimating future traffic over the I-5 bridge, the DEIS, and now the FEIS, seriously over-estimate the adverse impacts from the no action alternative and significantly overstate the supposed benefits from the proposed action alternatives. For purposes of the required alternatives analysis, and the required analysis of many other direct and indirect impacts like air emissions, such erroneous over-estimates are clearly significant impacts that the FEIS now fails to address and that the public should have seen in a SDEIS.[4] Second, when reevaluating the replacement bridge's design, that analysis disclosed, for the first time, that there are alternative bridge designs available that could have far fewer adverse impacts on salmon and other aquatic species. In addition, the Peterson alternative presented to the CRC in 2010 confirms that alternative designs are available that require far fewer in water piers and create less shade

[4] There is simply no legal basis for the assertions in several government reports downplaying these errors that such erroneous traffic estimates are "good enough" for NEPA (*see* OST Review in INDIRECT IMPACTS—INDUCED GROWTH, TRAFFIC PROJECTIONS AND FINANCIAL ANALYSIS Exhibits/Sources Folder) and that accurate or the best traffic estimates are only necessary for the financial analysis that will be prepared for prospective bondholders.

O-002-002

over the river. The Federal Agencies' NEPA and ESA responsibilities (see 40 C.F.R. § 1500.2 and 16 U.S.C. § 1536 (a)(1)) do not allow them to summarily dismiss such less harmful alternatives and those alternatives had to be presented to the public for its evaluation in a SDEIS. Under the ESA, it is not enough for the Federal Agencies to simply avoid jeopardy (and the BiOp and NEPA analysis in the FEIS do not even show that). The Federal Agencies had to at least acknowledge and consider alternatives—here bridge designs—that could actually enhance salmon habitat and increase the chances for recovery. See *Sierra Club v. Glickman*, 156 F.3d 606 (5th Cir. 1998). Instead, those designs appear to have been summarily dismissed primarily because of concerns about aviation use at Pearson field. Such concerns, even if valid, (and the bridge design report questioned those concerns, *see* BRP Report, Non-NEPA Reports Folder), are not enough to justify the CRC FEIS summarily choosing to put the interests of Cessnas ahead of salmon.[5] The public was entitled to a SDEIS with a complete analysis of the tradeoffs involved and the impacts of such choices and alternatives. Rather than considering such alternatives and other environmentally friendly changes in good faith, as NEPA requires, CRC and state officials publicly stated that they would only consider changes to their LPA that, at least arguably, would not require a SDEIS. *See* Bailey CRC Letter in NEPA Process Folder. Such an approach to NEPA analysis violates both the spirit and specific requirements of that statute and its implementing regulations.

Overall, the missing analysis in the DEIS, new analysis and changes in the FEIS that could have been put into the DEIS, the cumulative impacts of all the changes to the action alternatives, and the failure to address significant new information showing materially incorrect traffic

[5] Agencies must consider otherwise reasonable alternatives even though they would require action by another agency or even legislative action to change current law. *Envir. Defense Fund v. Froehlke,* 473 F.2d 346 (8th Cir. 1974); *Muckleshoot Indian Tribe v. USFS,* 177 F.3d 800, 814 (9th Cir. 1999).

O-002-002

forecasts and less harmful alternatives for salmon, all combine to trigger the need for a supplemental DEIS under 40 C.F.R. § 1502.9 and 23 C.F.R. § 771.130. Absent a SDEIS, the public will not have a meaningful opportunity to comment on all of this significant information and these significant impacts.[6] Indeed the federal agencies desire to avoid such public scrutiny is so determined that those agencies even rejected a request to give the public an additional 30 days to comment on the substantially changed and very lengthy FEIS. *See* FEIS Comment Extension and Denial of Extension in NEPA Process Folder. Apparently even though they are proposing to spend over $3 billion on the largest public works project in the history of Oregon and the largest in-water project in the Columbia River since salmon were listed under the ESA, an additional 30 days is just too much to ask.[7] Additional exhibits supporting these SDEIS Comments can be found in the Media Folder, the Non-NEPA Reports Folder, the NEPA Process Folder, and the Other Comments.

[6] Posting some of this information and analysis on its website or disclosing it at public meetings during the more than 3 years between the DEIS and FEIS is no substitute for the opportunity to comment as part of the official and required NEPA process. Until analysis appeared in or was incorporated into the FEIS the public had no way of knowing what analysis the CRC considered final and a part of the required NEPA analysis. For example, the Independent Review Panel went out of its way to assert that its findings and hearing were NOT part of the NEPA process. NEPA does not provide for or allow a "rolling evaluation." None of these interim documents or interim analysis was released as part of an arguably NEPA compliant document until they were expressly used by or incorporated into this FEIS, and agencies can only use such NEPA compliant documents to satisfy NEPA's requirements. NEPA requires a comprehensive EIS that gathers all of the relevant analysis and information in one place for public comment precisely to avoid such confusion and obfuscations regarding what is and is not final and relevant to the required NEPA evaluation.

[7] Indeed the Federal Agencies also rejected a request for additional time to comment on the DEIS. They rushed through the DEIS comment process and then took more than three years to finalize the FEIS. Apparently an additional 30 days for public comment is unreasonable but more than three years to revise an FEIS is reasonable.

Purpose and Need

O-002-003

The FEIS did not change the purpose and need statement from the DEIS despite many comments, from PEAC and others, that the purpose and need were improperly narrow. Nor did the CRC sufficiently respond to the genuine concerns presented in PEAC's comments. The purpose's scope is still geographically limited to the Bridge Influence Area (BIA) rather than focusing on broader transportation concerns between Portland and Vancouver. The purpose and need were not expanded to address the region's commitment to sustainable development but rather were maintained in a way that only allows alternatives that increase car capacity. The FEIS fails to analyze an adequate scope of project impacts due to a limited scope of review. The project purpose is unjustifiably limited to improving freight and traffic conditions along the I-5 freeway corridor, yet the north-south flow of traffic through the Portland-Vancouver metropolitan area is regional in nature, with an additional crossing along the I-205 freeway. By failing to consider regional alternatives, and therefore, regional impacts, the FEIS has insufficiently analyzed the ecological, health-based and cumulative impacts of the project. Given the crucial role that the purpose and need statement plays in directing the range of the alternatives, a fuller explanation of the decisions that went into the development of the purpose and need statement is necessary.

The CRC's responses to PEAC's comments were vague and unhelpful.

O-002-004

The CRC responded to a wide range of PEAC comments with a formulaic answer that did not adequately address PEAC's concerns. When an agency has decided to not take action in response to a comment, such as by modifying the proposed action, it must "explain why the comments do not warrant further agency response, citing the sources, authorities, or reasons which support the agency's position." 40 C.F.R. § 1503.4(a)(5). The CRC did not meet this

O-002-003

See below for responses to these and subsequent comments on purpose and need. Some of these comments are similar in content to the comments PEAC submitted on the DEIS. See the FEIS, Appendix P (CRC DEIS Comments) (on the CD included with the FEIS and with the FEIS Summary) for responses to PEAC's DEIS comments. Additional information is provided below.

O-002-004

Responses were provided directly to all comments received on the DEIS. Where the information in the EIS itself provided the requested information or explanation, the responses to comments referred to the EIS rather than repeating that text in the response itself. The FEIS includes information relevant to PEAC's purpose and need comments. Chapter 1 includes the purpose and need itself, as well as a description of how the purpose and need were developed (Section 1.2). Section 3.1 includes a more detailed discussion of the transportation needs that the project is intended to address. The following responses also provide more information relevant to the points raised in this comment.

O-002-004 standard of explanation but rather used a blanket response to concerns that ranged from the failure to integrate sustainability into the purpose to the claim that the purpose and need statement led to an inappropriately narrow range of alternatives. *See, e.g.,* responses 035-032; -036; -038; -041. The responses addressed this entire range of comments by claiming that the purpose and need were based on "extensive analysis." *Id.* However, the law requires a more detailed response that vague references to an analysis in order to demonstrate that the CRC truly considered the legitimate concerns raised in the comments.

Rather than providing helpful explanation, the CRC's responses contained circular and confusing logic. PEAC commented that a broader purpose and need statement is necessary in order to allow consideration of a wider range of alternatives. PEAC Comments at 27. In response, the CRC consistently stated that the initial assortment of alternatives was limited prior to the DEIS in order to meet the project's purpose and need, which are best met by a multimodal alternative including highway improvements. *See, e.g.,* Responses 035-029; -034; -42. This response does not address PEAC's concern but rather supports its argument that having a properly defined purpose and need is essential to the creation of an appropriate range of alternatives. Because the purpose and need is crucial to shaping the ultimate range of alternatives, there should be a detailed explanation of how they were developed, in order to allow true public evaluation of the process and decisions that produced the purpose and need statement.

The purpose and need were inappropriately focused on the BIA.

O-002-005 The CRC failed to explain or justify the narrow restriction of the purpose and need to concerns at I-5 river crossing. Rather, the responses refer to an "extensive analysis" of transportation problems identified in earlier studies. Responses 035-032; -036; -038; -041; -051. The only specific study cited in the responses is the Transportation and Trade Partnership Study

O-002-005

As discussed in the FEIS (Chapters 1 and 2), the I-5 Transportation and Trade Partnership studied transportation problems in the I-5 corridor between Portland and Vancouver, and in 2002 recommended specific projects and additional studies to address those problems. CRC was one of the projects identified (see Section 2.7.3 of the FEIS) to address a specific set of needs.

The project is not intended to address region-wide transportation needs; it is intended to address six needs in the I-5 corridor, as discussed in Chapter 1 of the EIS. The purpose and need, and the project itself, cover a wide range of transportation issues in a very problematic section of a significant corridor.

While the purpose and need focus on addressing issues primarily within the bridge influence area (BIA), the project considered a wide range of potential solutions, including actions well outside the BIA, during the early stages of the CRC study as well as in studies that preceded the CRC. The early screening of alternatives demonstrated that none of the alternatives that were outside the BIA could adequately address the project's purpose and need, and thus they were not carried forward into the DEIS. This is discussed in the FEIS as well as in responses to comments.

O-002-005

and Strategic Plan. Response 035-051. This study identifies the importance of the I-5 corridor and the need for improvements to meet growing demand and recommends a multimodal approach. PORTLAND/VANCOUVER I-5 TRANSPORTATION AND TRADE TASK FORCE, FINAL STRATEGIC PLAN 3- 4 (June 2002) in Traffic and Induced Growth Folder. However, the study does not explain the decisions behind the development of the purpose and need which were done by a separate agency at a separate time and the CRC cannot claim that the study restricts its ability to shape an appropriate purpose and need. The CRC must explain why the purpose and need were so narrowly focused on the BIA in order to allow a true evaluation of the process.

The CRC relied on this same "extensive analysis" to respond to PEAC's claim that the true purpose of the project was to increase car capacity. PEAC DEIS Comments at 20; Responses 035-032; -036. The responses recognized the importance of the purpose and need in shaping the range of analysis as the responses consistently justified highway improvements as necessary in order to meet the stated purpose and need. Because the purpose and need are so influential in directing the course of the project, how they were developed should be fully explained in order to ensure a thorough and impartial process. Merely referring to earlier studies and an extensive analysis is insufficient because that only describes the process through which the purpose and need were narrowed not the actually decisions behind the final purpose and need statement or any justifications for its narrow scope.

The purpose and need statement ignores the region's deep commitment to sustainable development.

O-002-006

PEAC commented that the purpose and need were focused narrowly on increasing car capacity and thus failed to reflect the strong state, local, and community support for sustainable development. PEAC Comments at 21. The CRC did not specifically address why sustainability was not included in the purpose and need but merely discussed how projects that did not include

O-002-006

Sustainability is one of many regional public policy goals; that alone does not warrant it being included in the stated purpose and need for this proposed action. Sustainability issues (related to community, the environment, and financial considerations) were reflected in the CRC project Vision and Values, and included in the evaluation criteria used to determine which options and alternatives would be advanced to the DEIS, as discussed in Chapter 2 of the FEIS. While the project does aim to promote sustainability principles, and has developed a Sustainability Strategy, sustainability is not among the fundamental needs for this project.

Regarding vehicle miles travelled (VMT) and greenhouse gases (GHG) in particular, analysis in the FEIS demonstrates that the LPA would reduce regional VMT and GHG emissions compared to No-Build. Regional VMT is reduced as a result of mode shift to transit and the elimination of some trips due to highway tolling. The reduction in congestion on I-5 also shortens some trips that would otherwise use the longer I-205 route to avoid the I-5 congestion, although this is partially offset by trips that divert to I-205 to avoid the toll on I-5, as discussed in Section 3.1 of the FEIS. GHG emissions are reduced as a result of mode shift to transit, the elimination of some trips due to highway tolling, and the reduction in congestion on I-5. There is no requirement that the EIS evaluate alternatives that reduce GHG emissions below current levels. The project is included in the Portland area's Regional Transportation Plan (RTP) and the Vancouver area's Metropolitan Transportation Plan (MTP), and is in both state transportation improvement programs.

O-002-006

highway improvements did not meet the purpose and need.[8] This response emphasized again the importance of having a properly defined purpose and need in order to develop a true range of alternatives. Responses at 035-038; 041 (stating that a multimodal approach best meets the project's purpose and need). Failing to include the region's commitment to sustainable development in the purpose and need statement meant that, from the outset of the project, alternatives would be biased toward increasing car capacity rather than proactively moving the region toward meeting its emission reduction goals. If the purpose and need had recognized sustainable development as an essential purpose of the project, more innovative and environmentally low impact projects could have been evaluated as alternatives.

The CRC also failed to respond to how the narrow purpose and need led to a selection of alternatives that did not include an option that would actively reduce vehicle miles traveled (VMT) and greenhouse gas emissions. Rather, the CRC argued that there is "no requirement that any action by itself reduce future emissions and that broad reductions only come from a wide variety of actions" and that a build alternative is a step in the right direction. Response 035-037. While there is no requirement that a single project *by itself* reduces future emissions, a project of this scale and investment must at least contribute to the regional sustainability and climate change goals. Transportation is a major source of emissions and the CRC crossing is currently the region's most significant and expensive transportation project. Every alternative presented in the FEIS only reduces emissions below the no-build, business-as-usual scenario, and does not proactively reduce emissions. This is not consistent with the regional goals of mitigating climate

[8] The CRC staff did include a new "Sustainability Strategy" with the FEIS. FEIS, Appendix C. This approach to sustainability is the equivalent of buying a Hummer and then insisting that you will drive it "sustainably." The new CRC "strategy" is an interesting exercise in creative writing, but this post hoc (post-alternatives analysis) action is no substitute for making sustainability an important part of the CRC's purpose and need statement.

O-002-006 change by reducing VMT and GHG emissions by 75 percent from 1990 levels by 2050. In order to explore the relationship and trade-offs between increasing car capacity and increasing VMT and emissions levels, a viable alternative should have been evaluated that actively decreased emissions and VMTs, such as a plan that focuses on decreasing car use through tolling, transit investments, and adjusting regional transportation management. By narrowly restricting the purpose to focus on congestion in the I-5 corridor, viable alternatives that could truly decrease emissions and VMT were excluded without true consideration.

The purpose and need statement inappropriately limits the range of alternatives.

O-002-007 Federal agencies must include in an EIS a statement that "briefly specif[ies] the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action." 40 C.F.R. §1502.13. The required purpose and need statement is critical because it determines the scope of reasonable alternatives. *See Nat'l Parks & Conservation Ass'n v. BLM,* 586 F.3d 735, 746 (9th Cir. 2009); *Simmons v. U.S. Army Corps of Engineers,* 120 F.3d 664, 666 (7th Cir. 1997) (noting that "[o]ne obvious way for an agency to slip past the strictures of NEPA is to contrive a purpose so slender as to define competing 'reasonable alternatives' out of consideration (and even out of existence)"). In evaluating a claim that an agency failed to consider a reasonable range of alternatives, "a court begins by determining whether or not the Purpose and Need Statement was reasonable." *Westlands Water Dist. v. U.S. Dept. of Interior,* 376 F.3d 853, 865 (9th Cir. 2004).

The CRC's responses never refuted that the narrow purpose and need statement led to an inadequate range of alternatives. Rather, the responses merely asserted that the alternatives were created by an "evaluation and screening of a wide array of possible solutions" which revealed that capital improvements were necessary within the I-5 corridor in order to meet the purpose and need. Responses 035-029; -034; -042; -45; -047; -048. This response did not demonstrate

O-002-007

The DEIS and FEIS considered a wide array of improvements, including significant light rail transit improvements, highway improvements, bicycle and pedestrian improvements, tolling, and other TDM/TSM measures. The LPA includes all of these elements. The purpose and need allowed for a wide range of potential solutions to meet the various needs. For example, the test of whether or not certain types of components could meet the congestion-related need allowed flexibility in how it could be met. Components could either "increase vehicular capacity or decrease vehicular demand" to meet the congestion- and mobility-related needs, as described on page 2-72 of the FEIS. See all of section 2.5 of the FEIS and the responses to your comments on the DEIS. See also the responses above and below regarding the range of alternatives evaluated.

O-002-007 that the alternatives were adequate, but supports the argument that drawing the purpose and need too narrowly results in the inappropriate exclusion of disfavored ideas and concepts. Here, by focusing the purpose and need solely on increasing mobility in the I-5 BIA, many alternatives that would have less environmental impact while still relieving congestion were rejected out of hand. The CRC cannot write off the crucial interaction between the purpose and need and the range of alternatives by referring to vague screening processes. It must acknowledge and explain why the purpose and need were drawn so that the only alternatives, from a very wide initial array, focused exclusively on highway improvements that would increase car capacity.

The CRC failed to justify the impermissible narrow range of alternatives evaluated in the DEIS and FEIS.

O-002-008 The range of alternatives in the DEIS and FEIS was not reasonable and only presented an extreme choice between expensive build options and the untenable no-action, do nothing alternative. PEAC Comments at 28-31. The CRC did not respond to this comment but only insisted that alternatives that did not include highway improvements did not meet the project's purpose and need, specifically traffic congestion and safety problems. Response 035-042. These conclusory statements were insufficient explanation of why certain alternatives were dropped from a full evaluation in the DEIS and FEIS.

Rather than explaining the justification for dropping certain aspects of the project the responses only mention vague "analyses and input" that indicated certain alternatives would not meet the project's purpose and need. Response 035-042. The response referred the reader to Appendix C of the DEIS for a more thorough explanation of the early screening process. This two-page document explains the process that components went through and includes a conclusory chart showing which early components failed the six pass/fail screening questions. However, this document does not contain any analysis or explanation for why certain

O-002-008

Please see the response to comment O-002-007 above.

O-002-008

components were deemed to have failed these threshold questions. NEPA requires that both conclusions and the underlying analysis appear in the EIS.

The Development of Alternatives Memo suffers from the same problems of superficial analysis rather than actual discussion. Response 035-053. The document identifies that its purpose is to "briefly summarize the process" through which the alternatives were developed. COLUMBIA RIVER CROSSING, DEVELOPMENT OF THE RANGE OF ALTERNATIVES MEMO [MEMO] 1 (June 2007) in Alternatives Folder. True to its word, the memo focuses entirely on process, rather than in-depth discussion of why the range was so restricted. *Id.* at 3 (noting that "analysis revealed" in Attachment G that the replacement bridge was the best option). The analysis contained in Attachment G to the Memo, titled Component Findings, only evaluates 12 option packages that combined a supplemental or replacement bridge with different transit options. *Id.* Thus, the only explanation for the early dismissal of other options, such as opening up a new corridor or improving I-205, is the checklist in Appendix C. This is simply inadequate to explain the limited options the CRC evaluated in the DEIS and FEIS.

The DEIS and FEIS should have included a fuller range of alternatives in order for the public to truly examine the pros and cons and trade-offs of different potential solutions. The decision to focus exclusively on build alternatives that involved massive new bridge construction meant that the CRC failed to evaluate a full range of alternatives as required by NEPA and inadequately justified this limited range. NEPA requires that an EIS must consider a reasonable range of alternatives. 40 C.F.R. §1502.14. This analysis is the "heart" of the NEPA process, *Center for Biological Diversity v. U.S. Dept. of Interior,* 623 F.3d 633, 642 (9th Cir. 2010), and the federal agencies must "rigorously explore and objectively evaluate *all* reasonable alternatives." 40 C.F.R. §1502.14(a) (emphasis added); *Muckleshoot Indian Tribe v. USFS,* 177

O-002-008

F.3d 800 (9th Cir. 1999). "The existence of reasonable but unexamined alternatives renders an EIS inadequate." *Friends of Southeast's Future v. Morrison,* 153 F.3d 1059, 1065 (9th Cir. 1998). While NEPA does not require a specific number of alternatives,[9] "[a]n agency must look at every reasonable alternative, with the range dictated by the nature and scope of the proposed action, and sufficient to permit a reasoned choice." *Alaska Wilderness Recreation & Tourism Ass'n v. Morrison*, 67 F.3d 723, 729 (9th Cir. 1995).

The CRC did not explain why it excluded discussion of available alternatives with less environmental impact.

O-002-009

In both the DEIS and FEIS, the CRC only considered options that increased highway capacity. It did this despite being presented with viable alternatives that were both cheaper and had potentially less environmental impact. The CRC did not attempt to honestly evaluate these options but merely responded that other alternatives had been dropped in the early stages of the screening process. *See, e.g.*, Responses 035-042; 004-011; 004-016; 034-005.[10] Rather than just issuing conclusory rejections of these alternatives, the CRC, consistent with 40 C.F.R. § 1500.2, should have honestly considered these options' impact on the environment and compared that with the replacement and supplement bridge alternatives. These or similar low-impact alternatives should be evaluated in a SEIS so that the public can compare these options to the LPA and comment on the different approaches.

The CRC was aware of the following sophisticated alternatives:

a. The Association of Oregon Rail and Transit Advocates had developed a detailed, phased approach to addressing the project's purpose and needs. See attachments to AORTA

[9] 42 U.S.C. § 4332(2)(C); 40 C.F.R. § 1502.14; *Native Ecosystems Council v. USFS,* 428 F.3d 1233, 1246 (9th Cir. 2005).

[10] The CRC cannot dismiss or refuse to consider options that include tolling the existing bridges and I-205. Either the FHWA of Congress could approve such an option, and an agency must consider options that would require a change in the law or other agency action. *See id.*

O-002-009

A wide variety of components, proposals, and other ideas were proposed and considered. Proposals that did not meet the fundamental needs for the project were not reasonable and did not need to be further evaluated. For example, the AORTA alternative had many elements in common with ideas that had already been evaluated--and dropped--prior to the DEIS because they could not meet the purpose and need and/or had significant feasibility problems. The "Straight Alternative" emerged after the DEIS and had some concepts similar to previously evaluated ideas, as well as some unique elements. The Bridge Expert Review Panel reviewed the "Straight Alternative" and did not recommend that CRC advance it. The CRC staff also reviewed it and found that it had substantial performance deficiencies, additional constructibility issues, and additional impacts, as outlined in an August 25, 2011 memorandum from Frank Green and Casey Liles to Nancy Boyd, CRC Project Director.

O-002-009

Comments; www.aortarail.org/. The approach would likely be cheaper overall and allow for continuing evaluation of the impact of gradual improvement. The proposed steps are: 1. Fix the rail bridge, which will decrease the use of the I-5 drawbridge and decrease the number of lifts by 95%. 2. Construct multi-modal bridge to Hayden Island. 3. Construct a new bridge for commuter trains, intercity trains, car, bikes and pedestrians that would open up more track capacity for freight trains. Correct Mill Plain and Marine Drive to allow trucks to bypass I-5. Enhance commuter rail between Vancouver and Union Station in Portland. This new bridge could be located far from Pearson Field so that it could be a suspension bridge design without piers in the water. 4. Upgrade the I-5 bridges to current seismic standards. 5. Build a new bridge between Hayden Island and Vancouver.

AORTA's well thought out plan was dismissed in the responses by claiming it did not meet the project's purpose and need. *See, e.g.*, response 034-005. This assertion is a conclusion not a discussion. The Development of the Range of Alternatives Memo referred to only evaluated a small range of options after more than half of the components had been removed due to early screening. MEMO at 3.

b. The CRC also failed to adequately address the recommendations of the Portland Pedestrian Advisory Committee that were aimed at limiting environmental impacts and enhancing the urban landscape. PAC's recommendations included: providing HOV or truck lanes to access port facilities, encouraging long distance freight use of I-205, capping the number of lanes at 4, expanding the light rail options, using congestion pricing as the primary means of regulating traffic flow, including both light rail and express buses, including traffic calming elements in the design, reducing lane widths, adding a local street along the Columbia, increasing bike and pedestrian network connectivity, and creating world class bike and

O-002-009

pedestrian routes. PAC Comments at 6-10. The CRC's responses did not show that the CRC seriously considered these options but reveal the same assumptive attitude that focused on highway construction. Response 004-011; 004-016. The CRC cannot simply ignore low-impact alternatives without presenting thorough analyses to the public. [11]

c. A third viable lower-impact alternative was presented to the CRC by Kevin Peterson, an accomplished bridge architect, which at least appears to meet the project's purpose and need statement. *See* Peterson Alternative Folder. This plan proposes a straight alignment bridge with a four lane collector-distributor serving Marine View Drive, Hayden Island and the SR-14 interchanges on a separate lower level below six lanes of thru traffic on the upper deck. *Id*. This new bridge would be place upstream of the existing I-5 bridges rather than the current downstream replacement bridge being suggested. This upstream alignment would allow for different bridge designs, such as a cable suspension bridge. Light rail transit and a bike and pedestrian pathway are included in the design, with the possibility of adapting the through lanes on the upper deck to light rail or high speed transit at a later time because of the straight alignment and the lack of cars merging onto the upper decks.

The potential benefits of this alternative include a substantially reduced footprint and less use of urban land, greater safety benefits by not having local traffic merge into interstate traffic, ability to expand transit options in the future, the potential to avoid piers in the water, and lower costs. *Id*. The potential benefits of this plan are extensive suggesting that the proposal deserved detailed review and should have been presented to the public. Indeed the potential that this

[11] The CRC's Executive Director told Metro and the Portland City Council that even measures to maximize use of the light rail line that is a part of the LPA would be "outside the scope" of the project. See attached videotape of 1/26/09 Hearing, NEPA Process Folder. Thus highway expansion rather than other transportation options was the clear and primary focus of the LPA and CRC's "alternatives analysis."

O-002-009

proposal has to reduce impacts on environmental justice communities, on Hayden Island and on Vancouver communities and to reduce impacts on salmon legally required that it be thoroughly and publicly analyzed. The CRC instead appears stubbornly wedded to traditional highway construction and unwilling to rigorously analyze more innovative solutions.

The CRC must develop an alternative that proactively reduces the factors, such as emissions, contributing to climate change.

O-002-010

PEAC and other groups commented that an alternative should have been presented that proactively reduced climate change factors, such as emissions and VMTs, given the region's commitment to reducing emissions. PEAC Comments at 33; Portland Planning Commission Comments at 9; Sustainable Development Commission at 2. Given that cars are a major source of emissions, a viable alternative should have been presented that reduced future emissions from current levels, not just from a future no-build, business-as-usual scenario. This would allow the public and agency to evaluate a side-by-side comparison of the different alternatives and compare the trade-offs present in each scheme.

The CRC failed to adequately respond to this assertion, using the same formulaic response that alternatives that did not involve highway construction failed to meet the project's purpose and needs. Response 035-045. It further claimed that the DEIS and FEIS demonstrated that the project would not increase greenhouse gas emissions. Response 035-044. This ignores the point that not increasing emissions is not the same as an alternative that would actively reduce emissions, such as one that involved larger investment in transit or other methods of reducing single occupancy vehicle use. Given the region's ambitious emission goals and public interest in climate change, an option should have been presented that moved the region toward meeting these goals.

O-002-010

Please see the response to comment O-002-006 above.

Regarding project design speed, it is 60 mph through most of the project, including the river crossing, and 70 mph for the Oregon section south of Hayden Island. Design speeds are lower on ramps. Significantly lower design speeds on the mainline would not be appropriate for an interstate highway and would have only minimal reductions in property acquisitions. The posted speed for the mainline is expected to be 60 mph or less, which is within the range of high fuel efficiency speeds for most vehicles.

O-002-010

The CRC also disregarded arguments about decreasing design speeds, asserting that increased design speeds reduce congestion and thus emissions. Response 035-004. It also noted that design speed is different than actual posted speed, which will remain lower. Response 035-040. However, this does not justify the fact that having higher design speeds necessitates a larger structure with the resulting environmental and community impacts and that reducing speeds is another way to reduce emission levels distinct from reducing VMTs. In the middle of a congested urban area, it is logical to design a bridge at a lower design speed potentially resulting in a smaller structure, decreased emissions, and safer conditions. The CRC should not have cursorily rejected a lower design speed but must seriously evaluate the benefits of a reduced speed and a resulting smaller footprint fro the project. ODOT and WashDOT clearly prefer a massive, sprawling structure that is simply not appropriate for densely populated urban areas. But the preferences of those highway agencies should not dictate the full range of alternatives presented in the EIS. But that appears to be exactly what happened here.

The CRC must develop an alternative that does not include highway construction.

O-002-011

A full range of alternatives should have included at least one option that did not include highway construction. PEAC comments at 36. Components that could have been combined to produce this alternative include increased transit, increased TMD/TSM, improvements to the rail bridge, tolling, strengthening the current bridge to meet seismic standards, and other structural or non structural solutions in the region. Additional options include a land use alternative where congestion is addressed through land transformation, such as having people work and live in close proximity. It is possible that a combination of these could satisfy the project's purpose and

O-002-011

Alternatives that did not involve highway construction were included in the early stages of alternatives analysis and screening. They were dropped from further evaluation when it became clear that they could not adequately address the project purpose and need. The EIS only includes alternatives that can meet the purpose and need, as discussed in Chapters 1 and 2 of the DEIS and FEIS. An alternative based on solely on land use controls intended to have "people work and live in close proximity" would also, by itself, not address the purpose and need. The region already promotes jobs/housing balance and has robust growth management, as discussed in Chapter 3. These land use policies are assumed in the No-Build and the build alternatives.

Transit, tolling, and other TSM/TDM measures were incorporated into the alternatives that were evaluated in the EIS, including the LPA. See Section 2.7 of the FEIS, and the responses to related comments on the DEIS, for further discussion.

O-002-011

need but the CRC did not ever evaluate these components in combination instead inflexibly insisting that alternatives that do not include highway improvements did not meet the project's purpose and need. *See, e.g.*, response 035-042. The CRC's intransigence prevented the consideration of more creative, innovative solutions. At the very least, a more complete range of alternatives would allow a more accurate comparison of the trade-offs involved in the different projects.

By focusing exclusively on the BIA, the range of alternatives did not evaluate the I-5 CRC project in the context of regional transportation. The DEIS and FEIS failed to evaluate how the alternative would impact the regional transit network or redistribute congestion problems. Merely shifting traffic and congestion would not serve the Portland and Vancouver communities or through freight carriers. More consideration should have been given to changes outside the I-5 corridor that could impact congestion in the BIA. For example, simultaneous investment in other routes between the Portland and Vancouver areas, mainly the I-205, should have been evaluated. These options were excluded from thorough consideration through a screening process that was not adequately explained or justified. Overall, the CRC presented a range of alternatives that precluded the discussion of more innovative solutions that could have addressed broader regional transportation concerns by consistently averring the necessity of highway improvements. The CRC must go back and provide greater analysis of a wider range of alternatives and more explanation of its decision-making process.

The FEIS Does Not Provide the Alternatives Analysis Required for a CWA 404 Permit.

O-002-012

The FEIS suggests that it may be used by the U.S. Army Corps to evaluate the CRC's future application for a Section 404 permit under the Clean Water Act. In performing its substantive review of an application, the Corps would be required to undergo a "public interest

O-002-012

Compliance with the alternatives analysis requirement for Clean Water Act 404 permits will be documented as part of the Section 404 permitting process, expected to occur in 2012.

O-002-012

review," which requires a determination of the "extent of public and private need for the proposed work," "the practicability of using reasonable alternative locations and methods to accomplish the objective of the proposed ... work," and "the permanence of … detrimental effects." 33 C.F.R. §§ 320.1(a)(1), 320.4(a)(2)(i)-(iii). In making these determinations, the Corps must consider "[a]ll factors which may be relevant to the proposal," including "the cumulative effects" of the project. 33 C.F.R. § 320.4(a)(1). In reviewing a Section 404 application, the Corps must also follow rules developed by EPA under Section 404(b) of the CWA, 33 U.S.C. § 1344(b), which are known as the "404(b)(1) Guidelines." 33 C.F.R. § 320.4(a). The 404(b)(1) Guidelines are codified at 40 C.F.R. Part 230. The Corps is prohibited from issuing any permit if, among other requirements:

> (i) There is a practicable alternative to the proposed discharge that would have less adverse effect on the aquatic ecosystem, so long as such alternative does not have other significant adverse environmental consequences; or
>
> (ii) The proposed discharge will result in significant degradation of the aquatic ecosystem … ; or
>
> (iii) The proposed discharge does not include all appropriate and practicable measures to minimize potential harm to the aquatic ecosystem; or
>
> (iv) There does not exist sufficient information to make a reasonable judgment as to whether the proposed discharge will comply with these Guidelines.

40 C.F.R. § 230.12(a)(3).

Where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge that do not involve a discharge to the special aquatic site "are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise." 40 C.F.R. § 230.10(a)(3). The FEIS does not come close to providing the necessary information to satisfy these requirements for a 404 permit application.

CUMULATIVE IMPACTS

O-002-013

This section of PEAC's comments focuses on the FEIS' general discussion of cumulative impacts, FEIS 3-429 to 3-460, and its related technical report. Other sections of this comment address other resource specific cumulative impacts issues, such as the significant omissions regarding cumulative impacts in the FEIS' discussion of impacts to threatened salmonid species.

NEPA documents must "provide full and fair discussion of significant environmental impacts." 40 C.F.R. §1502.1. Agencies must "consider every significant aspect of the environmental impact of a proposed action," *Ore. Natural Desert Ass'n v. BLM*, 625 F.3d 1092, 1100 (9th Cir. 2010), which includes the cumulative effects of a proposed action. *See* 40 C.F.R. §1508.25(c)(3). A "cumulative impact" is "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. 40 C.F.R. 1508.7. "Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." *Id.* A proper consideration of the cumulative impacts of a project requires "some quantified or detailed information; ... [g]eneral statements about possible effects and some risk do not constitute a hard look absent a justification regarding why more definitive information could not be provided." *Ocean Advocates v. U.S. Army Corps*, 361 F.3d 1108, 1128 (9th Cir. 2004)(*amended opinion*, 402 F.3d at 868). The analysis "must be more than perfunctory; it must provide a useful analysis of the cumulative impacts of past, present, and future projects," *Kern v. U.S. Bureau of Land Mgmt.*, 284 F.3d 1062, 1075 (9th Cir. 2002), and explain "how [] individual impacts might combine or synergistically interact with each other to affect the [] environment." *Klamath-Siskiyou*

O-002-013

The FEIS Section 3.19 and the Cumulative Impacts Technical Report address cumulative impacts for the project. For resources where the project would clearly have positive impacts, such as with the clean-up of existing hazardous materials, extensive discussion was not warranted. In cases where the project contributes to an existing and growing problem, such as climate change or declining salmon runs, greater detail was provided, even when the project has fewer impacts than the No-Build Alternative.

Regarding the geographic scope of the cumulative impacts analysis, the scope was not limited to the bridge influence area (BIA) or any other single geographic area. Rather, the geographic scope differed based on the resource in question. For example, the cumulative impacts of climate change is largely based on a global phenomena and the cumulative impacts on aquatic species included an analysis of impacts to affected fish runs, including an in-depth discussion of the primary drivers of fish health in the entire Columbia River basin--such as the hydropower and hatchery systems that extend outside the BIA.

Regarding the Bradwood LNG project, CRC staff was aware that the previous Bradwood proponents had ceased pursuing it in 2011 while we were preparing the CRC FEIS. However, we chose not to remove it from the cumulative impacts analysis because the likelihood of a new proponent coming forward to take advantage of that site or another similar site seemed reasonably foreseeable. From a cumulative impacts perspective, the impacts of the Oregon LNG proposal in Warrenton would be very similar to those considered from the Bradwood LNG project in the CRC cumulative impacts analysis.

The impacts from CRC construction on fish and other aquatic species are discussed in Section 3.16 of the FEIS and in the Ecosystems Technical Report. The cumulative impact analysis in Section 3.19 does

O-002-013

Wildlands Ctr. v. BLM, 387 F.3d 989, 997 (9th Cir. 2004). Under NEPA, the federal agencies must to take a "hard look" at significant environmental consequences. *Kern*, 284 F.3d at 1066. "A 'hard look' does not dictate a soft touch or brush-off of negative effects." *Native Ecosystems Council v. USFS*, 428 F.3d 1233, 1241 (9th Cir. 2005).[12]

The Ninth Circuit has underscored the importance of cumulative impact analysis. *See Kern*, 284 F.3d at 1076 (EAs require "adequate consideration of cumulative effects" and must be addressed "fully"). This is particularly true in an EIS, which "more thoroughly than an EA, [explores] the environmental consequences of a proposed action." *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1216 (9th Cir. 1998). The burden on a commentor to demonstrate inadequate cumulative impacts analysis is a low one, *Te-Moak Tribe of Western Shoshone of Nevada v. U.S. Dept. of Interior*, 608 F.3d 592, 605 (9th Cir. 2010), not even requiring that commentor to specify a particular project implicating cumulative impacts. *See, e.g., City of Carmel-By-The-Sea v. U.S. Dept. of Transp.*, 123 F.3d 1142, 1161 (9th Cir. 1997). PEAC need "show only the potential for cumulative impact." *Te-Moak Tribe*, 608 F.3d at 605.

When PEAC looked for a cumulative effects "analysis" that satisfies the Ninth Circuit case law in the "cumulative effects" section of the FEIS and its "Cumulative Effects Technical Report, " PEAC discovered (quoting Gertrude Stein) that "there is no there there." The FEIS's cumulative impacts "analysis" violates virtually every requirement for such analysis set out in the Ninth Circuit's case law. In this section of the FEIS, FEIS 3-429 to 3-460, the reader finds a series of conclusory assertions about no or limited cumulative impacts. The "analysis" simply

[12] Although a proposed action's impact may be minor, combined actions over time may be significant. 40 C.F.R. § 1508.7. Analysis must address combined or synergistic effects in addition to isolated effects. *See Klamath-Siskiyou Wildlands Ctr. v. BLM*, 387 F.3d 989, 997 (9th Cir. 2004). Analysis must be based on quantified or detailed information rather than vague or general statements about possible effects. *Ocean Advocates v. U.S. Army Corp of Engineers*, 361 F.3d 1108, 1128 (9th Cir. 2004) (*amended by* 402 F.3rd 846 (9th Cir. 2005)).

not repeat that text but does consider the project's impacts in the context of other past and reasonably foreseeable impacts. NMFS also considers cumulative impacts to threatened and endangered species as part of the ESA Section 7 process, and in its Biological Opinion and determination regarding incidental take. As discussed in the Ecosystems Technical Report and Section 3.16 of the FEIS, the project has sought to avoid and minimize impacts to the greatest extent practicable, and for those construction impacts that cannot be avoided, mitigation was proposed.

O-002-013

lists other projects with potential cumulative effects but makes no attempt to analyze or quantify such effects in any way. Other than an occasional general citation to a "technical report", the "analysis" cites nothing to support its repeated conclusory assertions about limited or no cumulative impacts. And when the public goes to the Cumulative Effects technical report, remarkably it is similarly devoid of specific citations to research or other analysis to support its assertions. What is the point of preparing a "technical report" that cites no technical information? This lack of cited support violates the above-cited case law and 40 C.F.R. § 1502.24.

Several statements in the cumulative effects "analysis" merits special attention. This section of the FEIS repeatedly refers to the "CRC project area." *See, e.g.,* FEIS at 3-429. The term is undefined and it is unclear how that area differs from the BIA. The technical report compounds this confusion by using the term "study area." Overall the geographic scope of the cumulative effects analysis is completely unclear. Although the Bradwood LNG proposal is discussed, apparently the CRC staff is unaware that in March of 2011 the Ninth Circuit vacated FERC's license issued to Bradwood. However, another LNG proposal for a terminal on the Columbia River, Oregon LNG, is moving forward and that proposal is not mentioned in the FEIS. The FEIS asserts that tolling will have "no negative impacts" on low-income populations. FEIS at 3-436. That assertion is completely unsupported and is in fact simply outrageous.

Perhaps the single most significant omission from the cumulative impacts discussion is the total failure to mention the impacts from construction activities on aquatic species, including the impacts when construction continues outside the in water work window. Years of in-water work, including substantial periods of work outside the protective in-water work window, will have significant cumulative impacts on aquatic species including all the species of threatened salmon. The analysis also erroneously asserts that the LPA, once constructed, would have the

O-002-013

same adverse impacts on salmon. In fact the LPA would have much larger in-water piers, and would cast a much larger shadow on the river, and would create many more acres of impermeable surfaces and their associated storm water run off. It will be one more large obstacle that migrating salmon must maneuver under and around, and the FEIS fails to discuss how the cumulative impacts of the ever increasing number of such obstacles in the Columbia and Willamette Rivers and how such repeated additions to and degradations of salmon is consistent with the federal agencies' responsibilities under sections 7(a)(1) and (2) of the ESA.

DIRECT IMPACTS—AIR, WATER, AQUATIC SPECIES, and ENVIRONMENTAL JUSTICE/COMMUNITY/PUBLIC HEALTH IMPACTS

WATER QUALITY

O-002-014

The FEIS water quality section, like the water quality section in the DEIS, fails to provide the public with essential basic information about the project.

One of the primary purposes of an environmental impact statement is to "provide full and fair discussion of significant environmental impacts" that "inform[s] decisionmakers and the public."[13] Where an EIS fails to provide basic information about a proposed project that is essential for decisionmakers and the public to make an informed decision about the project, it fails to meet the requirements of NEPA and its implementing regulations. The CRC FEIS has failed to provide important information to the public in a number of circumstances. This puts the burden on the public to seek out relevant information needed to come to conclusions and meaningfully comment on the proposed project.

The FEIS water quality section fails to adequately quantify the total number of acres of impervious surfaces created by the project. On this point, the FEIS continually hides the ball. Exhibit 3.14-4 indicates the amount of pollutant generating impervious surfaces (PGIS) that will

[13] 40 C.F.R. § 1502.1.

O-002-014

Section 3.14 of the FEIS discusses the water quality conditions and proposed treatment in adequate detail for the FEIS. Additional technical information is provided in the Water Quality and Hydrology Technical Report and Appendix A (Stormwater Management Memorandum). The commenter notes the addition of both pollutant-generating impervious surfaces and non-pollutant-generating impervious surface throughout the project area.

The FEIS and its technical reports and appendices discuss the use of water quality treatment scenarios and provide results of models tailored to roadway projects and their runoff. The use of the WSDOT-FHWA model is summarized on page 3-341 of the FEIS and discussed in further detail on page 4-6 of the Water Quality and Hydrology Technical Report. This discussion is refined in the technical report errata. As summarized on 3-341 and 3-342 of the FEIS, LPA Option A would increase total impervious surfaces by 42 acres from approximately 239 acres currently. Of these 42 acres, only 28 acres are anticipated to be pollutant-generating, with the remainder being surfaces such as bike/pedestrian and LRT facilities. Therefore, although an increase of 11 percent of pollutant-generating impervious surface would occur, a decrease of untreated stormwater runoff would also occur, from approximately 219 acres to zero. The analysis using the available models and the discussion associated with stormwater treatment BMPs (in the Appendix to the Water Quality and Hydrology Technical Report) show that overall pollutant loading will decrease and that stormwater treatment will treat at least 80 to 90 percent of annual runoff. The project has committed to increasing that treatment rate wherever practicable, and is required in Washington to treat 91 percent of annual runoff (page 4 of Appendix A of the Water Quality and HydrologyTechnical Report). The BMPs proposed for stormwater treatment are designed specifically for treatment of roadway runoff and are effective in reducing sediments, particulates, and dissolved metals (Page 10 of Appendix A of

O-002-014

be created. The provided estimate of the proposed increase in total impervious (PGIS and non-PGIS) area is approximately 42 acres.[14] However, this estimate does not include all areas that may create impervious surfaces.[15] Further, Exhibit 3.14-4's claim that the untreated PGIS area will drop from 219 acres under the no-build alternative to zero for the LPAs seems to be directly contradicted in the Water Quality and Hydrology Technical Report.[16] These inconsistencies fail to disclose to the public essential information about the actual impacts of the proposed project as required by NEPA.

In addition, the FEIS makes a distinction between the amount of contributing impervious area (CIA) created, which presumably includes PGIS and non-PGIS, and PGIS created. This distinction helps to obscure the total amount of impervious surface created by the proposed project. The distinction is also relevant in considering how much of the runoff from impervious surfaces will be treated before entering receiving waters. Oregon law requires more than just runoff from PGIS be treated, while Washington law limits the required treatment.[17] The FEIS does not clearly resolve whether Oregon standards for treating runoff from impervious surfaces will be met in all areas, or if Washington standards will be applied in some instances.[18]

The FEIS Water Quality and Hydrology Technical Report fails to provide specific citations to relevant sources that support the report's assertions. A general reference section is provided in the technical report and occasionally sources from that reference section are generally cited in the report's text. However, this is not sufficient to allow members of the public to determine when and how sources are used to support the assertions in the FEIS and

[14] FEIS at 3-341 to 3-342.
[15] *See e.g.*, FEIS at 3-341 (not including TriMet's Ruby Junction Maintenance Facility).
[16] Water Quality & Hydrology Technical Report for the FEIS, at 1-13 ("[U]ntreated PGIS would be reduced from the current 219 acres to approximately 8 acres for both LPA options.")
[17] Water Quality & Hydrology Technical Report for the FEIS, at 1-13.
[18] *See id.*

the Water Quality and Hydrology Technical Report). Where high concentration of oils and greases are anticipated, oil control pretreatment may also be required for proper operation of stormwater BMPs (Page 10 of Appendix A of the Water Quality and HydrologyTechnical Report).

The stormwater BMPs were chosen based on a multi-agency effort associated with both states' Departments of Transportation and relevant regulatory agencies. As MS4 permit holders, ODOT and WSDOT work with DEQ and Ecology, respectively, to determine appropriate treatment measures to ensure water quality in receiving waters. Thus, through use of the BMPs identified, the project team is confident that proper treatment for pollutants was adequately addressed in the FEIS. Final design of stormwater facilities cannot occur until near-final design of the project elements flowing into the facilities is complete.

As noted, further discussion with DEQ and Ecology will occur during permitting to address any concerns on water quality.

O-002-014

technical reports. Some 42 references are provided for the water quality technical report alone, leaving the public with the onerous task of reading through all the references to determine which might support any given portion of the technical report. Even where general citations are provided, the public is left to read through large reference materials to determine where the reference might provide information pertinent to the technical report. In addition, CRC seems to assume that despite this huge volume of information without specific citations, the public will still have an opportunity to meaningfully comment within a thirty-day comment period. The lack of specific citations serves to hamper the public in trying to meaningfully comment on the proposed project and undermines the NEPA process.

CRC's response to PEAC's water quality comments fails to meet NEPA requirements

PEAC submitted a number of comments addressing water quality issues identified in the DEIS. CEQ regulations require that agencies preparing final environmental impact statements "assess and consider comments" and where a comment does not warrant further agency response, the agency must "[e]xplain why" and cite "sources, authorities or reasons which support the agency's position."[19] Overall, the response to comments indicates that the FEIS is striving to meet the requirements of NEPA. But ultimately it fails for two basic reasons. First, to the extent that responses include updated or further information, that information is helpful, but should have been included in the DEIS. Providing the information in the FEIS indicates that it is available and should be provided to the public in a form that allows them to meaningfully comment on the information. A Supplemental EIS should be prepared to allow the public to adequately address all the new and updated information added to the FEIS. Second, to the extent that the FEIS attempts to equate compliance with other regulations and law as compliance with

[19] 40 C.F.R. § 1503.4(a).

O-002-014

NEPA, it violates NEPA. NEPA requires an independent analysis of impacts. While the underlying regulatory framework is relevant for NEPA purposes, compliance with it does not discharge an agency's duty to conduct a full NEPA analysis. The following discusses specific comments and responses where the FEIS fails to adequately address PEAC's comments related to water quality issues.

Specific inadequate responses:

PEAC pointed out that the DEIS failed to analyze the water quality impacts on the Columbia River, Columbia Slough, and Burnt Bridge Creek. PEAC noted that one alternative had runoff going into the Columbia Slough instead of the Columbia River, despite the fact that the Slough is probably more sensitive to water quality changes. In response, the FEIS states, that "[d]ue to design refinements, diversion of stormwater from the Hayden Island area to the Columbia Slough is no longer needed. Mitigation for stormwater is discussed as stormwater treatment, treatment facilities, and "best management practices" in Section 3.14 of the FEIS.[20] Further:

> Project designs have been refined so that stormwater is no longer diverted from the Hayden Island area to the Columbia Slough watershed. Furthermore, stormwater treatment will need to comply with local, state, and federal regulations which are meant to be protective of the environment. When approved, stormwater runoff would not exceed water quality standards. Please see Chapter 3 (Section 3.14) for updated analysis of stormwater management.[21]

While these comments do clarify that refined project designs will no longer result in Hayden Island area runoff to the Columbia Slough, there is still runoff to the Columbia Slough. Incomprehensibly, the FEIS seems to ignore the possible effects on the Columbia Slough, lumping it together with the Columbia River, and concluding that because "the Columbia River

[20] FEIS Comment Response O-035-012.
[21] FEIS Comment Response O-035-133.

O-002-014

and Columbia Slough are large water bodies . . . the project-related increase in stormwater quantity would not result in a measurable increase of flows in these surface waters."[22] In addition, the response ignores the broader issue. Water quality impacts on the receiving waters are not adequately discussed in the DEIS or FEIS. This is especially true for the Columbia Slough, which is a sensitive waterbody. The FEIS seems to equate the proposed compliance with water quality standards with disclosing impacts from the proposed project under NEPA. This is not sufficient. NEPA requires that agencies discuss direct and indirect effects and their significance.[23] Simply stating that water quality standards will be complied with does not disclose effects.

In another comment PEAC noted that the DEIS did not include any analysis about the specific pollutants in current stormwater discharges, so composition of re-diverted stormwater discharges was unknown. As a result, there is no way for the DEIS to accurately gauge pollutant concentrations and whether discharges will comply with water quality standards and TMDLs for the receiving waters. This is true for both treated and untreated stormwater. In response, the FEIS states:

> All permits and approvals for water quality and ESA would be obtained prior to construction and operation of the proposed project . . . . Construction activities are also regulated under Oregon DEQ and Washington DOE water quality permits. These permits set thresholds for turbidity and other water quality parameters . . . .
>
> The project met regularly with NMFS, USFWS, Oregon DEQ, Washington DOE, EPA, and many other agencies since 2006 to discuss the project and potential impacts. Both NMFS and USFWS concurred with coordinating through the DEIS and then initiating formal consultation after the DEIS. Submittal of a biological assessment occurred in July 2010, with the project receiving a letter of concurrence from USFWS in November 2010 and biological opinion from NMFS in January 2011.[24]

[22] FEIS at 3-343.
[23] 40 C.F.R. § 1502.6.
[24] FEIS Comment Response O-035-058.

O-002-014

As a result, the FEIS concludes that "[t]here is no evidence that complying with these treatment standards will result in a violation of standards under the Clean Water Act."[25] However, that is not the primary issue for NEPA purposes. All relevant laws, federal and state, should be complied with in carrying out the project, but compliance with those laws does not remove the agency's responsibility to prepare an EIS that adequately addresses impacts to the environment in a way that allows the public to meaningfully comment on the proposal. As discussed further below, the FEIS also does not correct the deficiencies noted in the DEIS with respect to pollutant load analysis.

PEAC further noted that the DEIS failed to properly evaluate base level runoff from the I-5 bridge, relying on EPA guidance about "typical" highway runoff. The base level is needed to determine if there is an actual increase in the volume of stormwater discharges from the increase in area of impervious surfaces. In response, the FEIS states:

> The DEIS and the associated Water Quality and Hydrology Technical Report used the WSDOT/FHWA method for evaluating highway runoff. The EPA reference supports that typical highway runoff includes those pollutants listed on 3-381 of the DEIS. The project team notes a reasonable connection between DDE, PCBs, arsenic, and dioxin highway runoff. However, there may be some indirect connection between temperature and total dissolved gas and highway runoff. There is a connection between PAHs in the forms of oils and greases and highway runoff under some situations. The proposed stormwater treatment facilities would treat for pollutants such as these.[26]

This response indicates that the project team is willing to rely on a model that may not accurately represent stormwater conditions on the ground. Further, it fails to address PEAC's concern that without a proper base line, it is impossible to determine whether the proposed project will reduce the harmful effects of stormwater runoff. The response simply assumes that the stormwater treatment facilities will treat for the relevant pollutants and their interactions. As discussed

[25] *Id.*
[26] FEIS Comment Response O-035-130.

O-002-014

further below, the stormwater treatment plan has not yet been finalized or fully provided to the public. Without this information, or information about the base line for current runoff, there is no way for the public to obtain an accurate determination of what, if anything, this project will succeed in doing with regard to stormwater pollution reduction.

In a related comment, PEAC stated that the DEIS must properly analyze the current pollutants in runoff, to accurately determine the environmental impact the build alternatives will have on discharges to receiving waters. Because the DEIS discloses the location of current discharges through road-side grates, obtaining samples from these location would not be difficult. In response, the FEIS concludes:

> The analysis referred to in the comment is not required under current local, state, or federal regulations. Also, although collecting and analyzing stormwater runoff from the I-5 bridge may have resulted in some site-specific and storm-specific data, this data is generally limited unless it is done over many, many sampling periods under different meteorological and traffic conditions. Updated stormwater modeling has been completed and is discussed in Section 3.14 of the FEIS and in the Water Quality and Hydrology Technical Report.[27]

The response is correct that regulations do not require a specific type of sampling analysis. However, again, the response misses the underlying point. There has not been a proper determination of the pollutants currently being discharged in runoff from the I-5 bridge. As a result, it is impossible to determine what effect the proposed project will have on pollution reduction. Further, the response's direction to updated stormwater modeling is not helpful. Even less pollutants are considered in the FEIS than were first considered in the DEIS, with no explanation for this change.

Much of PEAC's concern with the DEIS water quality analysis rests on the assertion that even though there will be an increase in impervious surfaces, creating more runoff, this increase

[27] FEIS Comment Response O-035-131.

O-002-014

is offset by more storm treatment facilities. In response to PEAC's comments concerning the flaws in this assumption, the FEIS states essentially the same thing:

> [A]lthough the total amount of pollutant generating impervious surface would slightly increase for the LPA, the amount of untreated impervious surface would drop dramatically (from 219 acres to 0 acres) compared to existing conditions and the No-Build Alternative. As a result, the LPA is expected to improve water quality in the Columbia River relative to the No-Build Alternative."[28]

However, there is still no base line provided. It remains unclear whether the FEIS assertions are supported.

Further, PEAC noted that because the stormwater collection and treatment system is still not finalized the DEIS cannot accurately report impacts to the public. Generally the delay in analysis of impacts to water quality makes it impossible for the public comment, in violation of NEPA. This delay in making many decisions also puts the resolution of important issues in the Final EIS, when the public can no longer meaningfully comment. In response to this comment, the FEIS states:

> The level of design for alternatives evaluated in the DEIS was conceptual, but provided an understanding of whether and how stormwater could be retained and treated to current standards for each of the alternatives. While the exact location and type of treatment facilities were not finalized prior to the DEIS, the effect on local waterbodies was identified for each of the alternatives. Advancements in design have changed the amount of runoff that would flow into some local watersheds, but this has not significantly changed the impact of this project on water quality and has not affected the ability of the project to meet existing water quality standards. Water quality analysis has been updated for the FEIS, and is included in Chapter 3 (Section 3.14).[29]

This new analysis has been provided only in the FEIS, when the public will not longer have the opportunity to meaningfully comment. Where new information is included, especially information that has a direct bearing on whether the project will effectively avoid environmental

[28] FEIS Comment Response O-035-130; *see also* O-035-132, O-035-134.
[29] FEIS Comment Response O-035-135.

O-002-014

degradation, the public must have an opportunity to review it before a decision is made. A supplemental EIS should be prepared to allow the public this opportunity. The stormwater facilities design is an integral part of the proposed project and bears directly on environmental issues.

PEAC also noted that the DEIS failed to disclose the water quality impacts from stormwater discharges off the 35-38 acres of untreated impervious surfaces under each of the build alternatives. In response the FEIS claims that the DEIS adequately discussed pollutant loading "including impacts from untreated areas."[30] It then concludes that "although the total amount of pollutant generating impervious surface would slightly increase for the LPA, the amount of untreated impervious surface would drop dramatically compared to existing conditions and the No-Build Alternative. As a result, the LPA is expected to improve water quality in the Columbia River relative to the No-Build Alternative."[31]

However, the FEIS still fails to consider increased pollutants from staging sites as part of the analysis for impervious surfaces. Staging sites are not considered as one of the project elements leading to the increase in impervious surfaces.[32] Yet, the FEIS acknowledges that "[s]taging and casting/assembly site activities may increase stormwater runoff over existing conditions and may increase pollutant levels in the runoff."[33] The FEIS simply concludes that "any staging and/or casting site would be required to meet all applicable stormwater requirements. All necessary permits would be secured prior to site development and operations for any major staging or casting yard."[34] This does not disclose the effects from staging site

[30] FEIS Comment Response O-035-134.
[31] *Id.*
[32] FEIS Exhibit 3.14-5 at 3-343.
[33] FEIS at 3-348.
[34] *Id.*

O-002-014

impervious surfaces, and does not provide an explanation for why these sites are not included in the analysis of impervious surfaces created. Overall, the FEIS readily admits direct impacts to waterways, however the FEIS also claims there will be no impacts to waterways. These statements conflict and show a lack of ground and surface water modeling to limit adverse impacts to natural resources.

PEAC commented that the DEIS fails to adequately analyze the effects of project construction on water quality standards. In response, the FEIS directs attention to "Chapter 3 (Sections 3.15 and 3.18) of the FEIS for the mitigation measures developed to avoid and minimize the impacts listed. Impacts that cannot be avoided must be minimized. The existence of potential impacts related to sediments and contaminants do not automatically mean that water quality standards would be exceeded if such impacts are not measurable. Construction activities will require the approval of the Washington State Department of Ecology and Oregon DEQ through a water quality certification and NPDES 1200-CA permit, limiting water quality impacts and imposing appropriate impact avoidance and minimization measures."[35] This does not adequately address the issue because, as this response admits, impacts related to sediments and contaminants during construction may affect water quality, and there is no measurement of those impacts. Just saying that such effects will not "automatically" violate water quality standards is not sufficient. There is no showing in the FEIS whether water quality standards will be violated or not violated. Further, water quality standards are not the only measure of impacts to the environment that may be relevant.

One of PEAC's comments focused on the water quality mitigation section of the DEIS, which was wholly inadequate. There was no listing of best management practices or any details.

[35] FEIS Comment Response O-035-137.

O-002-014

The section simply provided conclusory statements. In response, the FEIS indicates that the water quality analysis and discussion has been updated, and now includes best management practices.[36] Further, "[t]he development of stormwater treatment systems that meet the standards of local and state jurisdictions, plus those of WSDOT and ODOT, includes rigorous review by those agencies and others."[37]

The inclusion of best management practices is an improvement, however, as with much of the water quality analysis, it should have been included in the DEIS to allow the public to meaningfully comment. Further, relying on the scrutiny of other agencies in their functions as regulators of stormwater runoff is not adequate for NEPA purposes. As stated earlier, it is certainly important that all relevant regulations and laws be complied with by the proposed project. However, NEPA imposes a separate obligation to consider and analyze impacts to the environment. The regulatory framework in place is certainly part of that consideration[38], but compliance with regulation in and of itself does not meet the requirements of NEPA. Other impacts may not be addressed by regulations, and regulations may be focused on only eliminating certain impacts but not others. An EIS must address all direct and indirect effects and their significance.[39]

The FEIS does not satisfy the requirements of NEPA and a Supplemental EIS should be prepared.

The FEIS still fails to provide a base line level of stormwater runoff volume and pollutant loads.

The FEIS continues to emphasize that the no-build alternative will have a worse effect on water quality than the locally preferred alternatives (LPAs). The FEIS states:

[36] FEIS Comment Response O-035-138.
[37] *Id.*
[38] 40 C.F.R. § 1502.16(c).
[39] 40 C.F.R. § 1502.16.

O-002-014

> "The No-Build Alternative would adversely affect the quality of receiving waters in the long-term. Pollutant-loading of project waterways is currently influenced by a high percentage of untreated stormwater across the project corridor. If the LPA were not constructed this stormwater would likely remain untreated. Refer to Section 4.3 for further detail. The No-Build Alternative would not increase impervious surface and therefore, not increase stormwater volumes. However, average daily traffic (ADT) would increase with the No-Build Alternative and pollutant loads and concentrations would increase, though quantification is not possible. Yet, as previously stated, the majority of the stormwater would remain untreated."[40]

However, the assertion that the no build alternative will result in worse water quality is not supported by sufficient evidence. No base line has been established for the current volume and pollutant loads of stormwater runoff from the I-5 Bridge. Thus, it is impossible to conclude, from the information provided in the FEIS, that the LPAs will result in better water quality than the no build alternative.

In addition, the conclusion that the stormwater treatment plan will address the increased acreage of impervious surfaces and the relevant pollutants is not supported by the information in the FEIS. The FEIS has not accounted for all the stormwater runoff that will be created due to increase in impervious surfaces. For example, "no options have been identified to treat runoff from about 7.1 acres of new and resurfaced I-5 impervious surface immediately north of Victory Boulevard."[41]

Further, the FEIS seems to indicate that actually not all of the acres of contributing impervious area (CIA) will end up being treated. "The total CIA for the project is estimated to be 298 acres."[42] In reviewing the technical report on pages 1-17 and 1-18, if one adds up the number of acres that stormwater treatment facilities will cover in both Washington and Oregon, only 216 total acres will be treated. Because the public is not given information to establish how

[40] Water Quality & Hydrology Technical Report for the FEIS, at 1-12.
[41] Water Quality & Hydrology Technical Report for the FEIS, at 1-17.
[42] Water Quality & Hydrology Technical Report for the FEIS, at 2-2.

O-002-014

much pollution is likely to result from these 82 acres of untreated runoff, it is impossible to say how much of an effect this may have on water quality.

O-002-015

There are still many aspects of the project that require further analysis.

The DEIS delayed the full consideration of many integral project components until the FEIS. Thus, the public is presented with brand new and updated information in the FEIS. This does not allow the public to meaningfully comment on this new information. A supplemental EIS should be prepared to give the public this opportunity. In addition, in some cases the analysis that was delayed until the FEIS still has not been completed.

The Stormwater treatment facility design is still not finalized.

The FEIS fully admits that the final stormwater treatment design is still not complete. In the Water Quality and Hydrology section summary, the FEIS states:

> This section also discusses a conceptual stormwater treatment design for the LPA that has been developed for analysis purposes and to advance discussions with agencies on regulatory approvals. This design meets regulatory criteria. Agency coordination will continue through the development of the final stormwater design, to be completed as part of future permitting.[43]

The FEIS concludes that the "design of the stormwater collection and treatment system will be further developed, refined and analyzed after the ROD as part of the final project design."[44] This delay in allowing the public access to such a crucial component of the overall project is unacceptable. The FEIS continues to rely on the stormwater collection and treatment system as a cure all in the water quality context. Over and over the FEIS relies on the stormwater treatment system to gloss over the increased volume of stormwater runoff that will result from the creation of acres of new impervious surfaces, and in explaining away possible effects from pollution in the runoff. Yet, the actual stormwater treatment system design has not been finalized. This

[43] FEIS at 3-333.
[44] FEIS at 3-350.

O-002-015

PEAC commented that stormwater facilities should be advanced to final design prior to completing the FEIS. This is not required by NEPA nor any other law or regulation. As the FEIS discusses, the stormwater management facilities evaluated in the FEIS demonstrate the feasibility of providing stormwater management and treatment that will avoid significant adverse impacts to water quality and will comply with relevant regulations. The FEIS also notes that refinements will likely be made during final design. Those refinements are not expected to substantially change the performance of the facilities nor the impacts. However, while not expected, should such refinements result in new significant adverse effects not previously evaluated, then that could trigger a supplemental EIS.

O-002-015

provides no assurance that the stormwater treatment system will actually provide the benefits the FEIS asserts, and calls into question the entire water quality analysis.

The FEIS improperly puts off flood plain evaluations.

Executive Order 11988 and local and state regulations require more detailed analysis of floodplain impacts, including a no-rise analysis, prior to project approval.[45] The LPAs involve new bridge piers within the Columbia River. Thus, there is "the potential long-term impact of a rise in the flood elevation."[46] The FEIS delays consideration of this impact, indicating that it "would be addressed in a later design phase by conducting a flood-rise analysis."[47] If the flood-rise is later found to exceed that allowed, "the rise would be mitigated through floodplain excavation (cut/fill balance) activities."[48] This suggests that not only is the FEIS waiting to determine if future action will need to be taken, but that it fails to consider this future action as part of the indirect effects of the proposed project. Further excavation might be required to deal with a flood-rise that exceeds the allowed levels, resulting in churned up sediments and turbidity increases. However, the analysis of these impacts is not included in the FEIS and is delayed to some future time "prior to permitting" when the public will no longer be able to consider the effects as part of the proposed project.[49]

Pollutant loads are not properly analyzed to ensure that water quality standards and Total Maximum Daily Load (TMDL) allocations will be met.

O-002-016

The FEIS states that water quality limited waterways "may" be addressed through permitting, but does not adequately analyze impacts to water quality. For example, "[t]here may

[45] FEIS at 3-344.
[46] Water Quality & Hydrology Technical Report for the FEIS, at 6-1.
[47] *Id.*
[48] *Id.*
[49] FEIS at 3-344.

O-002-016

The FEIS and its technical reports and appendices discuss the use of water quality treatment scenarios and provide results of models tailored to roadway projects and their runoff. The use of the WSDOT-FHWA model is summarized on page 3-341 of the FEIS and discussed in further detail on page 4-6 of the Water Quality and Hydrology Technical Report. This discussion is refined in the technical report errata. As summarized on 3-341 and 3-342 of the FEIS, LPA Option A would increase total impervious surfaces by 42 acres from approximately 239 acres currently. Of these 42 acres, only 28 acres are anticipated to be pollutant-generating, with the remainder being surfaces such as bike/pedestrian and LRT facilities. Therefore, although an increase of 11 percent of pollutant-generating impervious surface might occur, a decrease of untreated stormwater runoff would also occur, from approximately 219 acres to zero. The analysis using the available models and the discussion associated with stormwater treatment BMPs (in the Appendix of the Water Quality and Hydrology Technical Report) show that overall pollutant loading will decrease and that stormwater treatment will treat at least 80 to 90 percent of annual runoff. The project has committed to increasing that treatment rate wherever practicable, and is required in Washington to treat 91 percent of annual runoff (page 4 of Appendix A of the Water Quality and Hydrology Technical Report). The BMPs proposed for stormwater treatment are designed specifically for treatment of roadway runoff and are effective in reducing sediments, particulates, and dissolved metals (Page 10 of Appendix A of the Water Quality and Hydrology Technical Report). Where high concentration of oils and greases are anticipated, oil control pretreatment may also be required for proper operation of stormwater BMPs (Page 10 of Appendix A of the Water Quality and Hydrology Technical Report).

The stormwater BMPs were chosen based on a multi-agency effort associated with both states' Departments of Transportation and relevant regulatory agencies. As MS4 permit holders, ODOT and WSDOT work

O-002-016

be special runoff control requirements [during construction] to address the 303(d) listings of each of the waterways in the project area."[50] Such statements do not adequately address pollutant loads and impacts associated with the proposed project. Relying on permitting compliance does not comply with NEPA because it fails to address all the potential impacts from pollutants. Permits do not limit all relevant pollutants. As a result, there may be impacts to water quality even where permits are complied with. These impacts must be disclosed in a NEPA analysis.

The FEIS reduces the number of pollutants considered as compared to the DEIS, without explanation. The FEIS no longer considers Total phosphorus in its consideration of annual pollutant load estimates.[51] However, both the Columbia Slough and Fairview Creek have TMDLs established for Eutrophication (pH, dissolved oxygen, phosphorus, and chlorophyll *a*), which includes phosphorus.[52] By not even considering the pollutants for which the receiving waters are water quality limited, the FEIS fails to adequately ensure that water quality standards will be met. In addition, the FEIS fails to accurately report the extent to which receiving waters are water quality limited. FEIS Exhibit 3.14-3 lists Burnt Ridge Creek as not having an established TMDL. However, while technically correct, the creek is currently under TMDL study to determine what needs to be done to improve failed water quality standards. The Washington State Department of Ecology has been gathering data for the past two years and this should be ignored. The FEIS should provide the public with this relevant background information. NEPA regulations require that an EIS provide a "full and fair discussion" of environmental impacts.[53]

[50] FEIS at 3-345.
[51] FEIS at 3-307; compare DEIS at 3-386.
[52] Water Quality & Hydrology Technical Report for the FEIS, at exhibit 4-2, 4-4 to 4-5 & exhibit 1-3 at 1-11.
[53] 40 C.F.R. § 1502.1.

with DEQ and Ecology, respectively, to determine appropriate treatment measures to ensure water quality in receiving waters. Thus, through use of the BMPs identified, the project team is confident that proper treatment for pollutants was adequately addressed in the FEIS.

As noted, further discussion with DEQ and Ecology will occur during permitting to address any concerns on water quality.

In addition, immediately prior to release of the FEIS for public review, the Regional Sediment Evaluation Team concurred with findings of a sediment analysis in the North Portland Harbor and the Columbia River. The sediment analysis found no contaminants above Sediment Evaluation Framework screening levels, with the majority of sediment constituents below reporting levels. See Appendix G of the Hazardous Materials Technical Report for the results of this analysis.

O-002-016

The technical report further admits that not all relevant pollutants are being analyzed. For example, in the Columbia Slough Basin analysis the technical report states that the analysis "does not include estimates for fecal coliform and lead" because "it is not clear whether these pollutants, for which there are TMDLs, would be reduced through the construction of the LPA."[54] The report goes on to conclude, however, that "with the addition of stormwater treatment and evidence that shows reduction of several pollutants, it is not likely that there would be a substantial increase in these pollutants and the LPA may actually result in a decrease of these pollutants."[55] There is no evidence that these pollutants will be decreased, or that the proposed stormwater treatment will have any impact on these specific pollutants. Further, the FEIS admits that "[p]ollutants from roadways typically include fuel, oil, grease, and other automotive fluids; heavy metals such as copper and zinc; and small particles from erosion or road sanding which can temporarily make waterways more turbid (cloudy)."[56] However, not even all these "typical" pollutants are considered and analyzed in discussing effects to water quality. Failing to analyze relevant pollutants, especially for which the receiving waters are water quality limited, does not promote confidence in the FEIS analysis of water quality impacts and does not satisfy the requirements of NEPA.

The FEIS also fails to provide support, even in the technical report, for assertions that riparian shading does not really affect water temperature in the Columbia River. The report states:

> "No TMDL has been established for any pollutant associated with highway runoff. However, the Columbia River in the project area is 303(d) listed for temperature. The project would remove approximately 250 feet of vegetation along the north and south

[54] Water Quality & Hydrology Technical Report for the FEIS, at 4-8.
[55] *Id.*
[56] FEIS at 3-333.

O-002-016

shorelines of the river in the vicinity of the new bridge structure and along the north and south shorelines of Hayden Island. Yet, this would not have a significant on the Columbia River water temperatures due to the large size of the river and the very minor role riparian vegetation plays on cooling water temperatures along the river currently."[57]

Thus, despite the FEIS' recognition that the Columbia River is water quality limited for temperature, among other pollutants,[58] it merely concludes, without citing any support for its assertion, that temperature will not be significantly affected by the proposed project.

Finally, the FEIS asserts that "[t]here are no known records of contaminated sediments in the Columbia River portion of the project area."[59] As a result, the FEIS assumes no re-suspension of pollutants in these sediments.[60] However, the Boise Cascade property within the project footprint (slated for shoreline redevelopment) was a former Superfund site. In addition, there is a scrap metal processing station immediately adjacent to the current bridge with considerable permit violations, including PCBs and other volatiles. The FEIS does not seem to have adequately researched potential contaminants in the area. This question has been raised several times with regard to mobilization of sediment into Vancouver Lake's flushing channel downstream, which is a closed system. Pollutants entering Vancouver Lake would not be flushed back out. Yet, there is no coordination planned to operate the flushing gates to prevent sediment or pollutant transport into the Lake during pile driving operations or other sediment disturbing activities.

The FEIS improperly limits consideration of the alternatives.

O-002-017

The FEIS only evaluates and provides updated analysis of water quality issues for the no build and locally preferred alternatives (LPAs). The FEIS states that Section 6002 of

[57] *Id.*
[58] The Columbia River is water quality limited for Toxics, Eutrophication, and temperature, with TMDLs set for Dioxin and Total Dissolved Gas. FEIS Exhibit 3.14-3.
[59] FEIS at 3-346.
[60] *Id.*

O-002-017

Following the DEIS, it was necessary to develop the preferred alternative to a higher level of detail, as allowed under Section 6002 of SAFETEA-LU [23 USC 139(f)(4)(D)], and as described on page 3-5 of the FEIS. Where this higher level of detail made substantial changes in estimated impacts, this information was also incorporated into the other alternatives, as appropriate, in order to maintain an apples-to-apples comparison. In some cases, updates were quantitative, while in others they were qualitative. For example, the LPA stormwater management design had to be advanced and evaluated to a higher level in order to develop a Biological Assessment (BA) in compliance with Section 7 of the Endangered Species Act. A BA is prepared on just one alternative, not multiple alternatives, so the stormwater management design and quantitative analysis were not revised for the other alternatives. However, the EIS noted that "If Alternatives 2 through 5 were reanalyzed using the updated stormwater design, they would provide water quality improvements similar to the LPA." This allowed the FEIS to maintain an 'apples-to-apples' comparison of all alternatives without spending additional public funds to provide a detailed recalculation of pollutant loading for every alternative (see the summary of water quality impacts on pages S-34). While such added analysis and cost would have provided additional quantitative data, it would not change the relevant conclusion of the comparison of the alternatives--that is, that all the build alternatives would provide similar water quality improvements.

O-002-017

SAFETEA-LU [23 USC 139(f)(4)(D)], allows for this narrowing of analysis "to facilitate development of mitigation measures and compliance with other environmental laws."[61] However, 23 U.S.C. § 139(f)(4)(D) goes on to state that this more focused analysis should only occur "if the lead agency determines that the development of such higher level of detail will not prevent the lead agency from making an impartial decision as to whether to accept another alternative which is being considered in the environmental review process." In addition, U.S. Dept. of Transportation Guidance on the issue states, "Under any scenario, a non-Federal lead agency proposing to develop the preferred alternative to a higher level of detail should state why it needs the greater design detail and why such work will not prejudice the consideration of alternatives."[62] In the context of the CRC FEIS, there are two problems with allowing the FEIS to only update the analysis for the no build alternative and LPAs. First, because there was not sufficient analysis of the alternatives in the DEIS, it is important that all the alternatives be developed completely in an FEIS, and where appropriate, a Supplemental EIS. Second, the FEIS

[61] FEIS at 3-334.

[62] UDOT SAFETEA-LU Environmental Review Process (Public Law 109-59) -FINAL GUIDANCE, 29 (November 15, 2006), *available at* http://www.fhwa.dot.gov/hep/section6002/index.htm, states "Under any scenario, a non-Federal lead agency proposing to develop the preferred alternative to a higher level of detail should state why it needs the greater design detail and why such work will not prejudice the consideration of alternatives. All lead agencies should evaluate carefully any proposal to develop a preferred alternative to a higher level of detail and consider the potential that such action has for creating a bias in the later consideration of alternatives and selection of the project alternative. The evaluation also should consider other factors that may affect the environmental review process. Examples of such factors include whether the identification of a preferred alternative might have an unacceptably adverse effect on public confidence in the environmental review process for the project; whether that adverse effect on public confidence could be avoided by delaying the differential treatment of alternatives until a later point in the environmental review process; how the difference in level of detail among the alternatives might affect the presentation of the alternatives in the environmental documents; or the extent to which the proposed preferred alternative is supported by the results of public and participating agency involvement."

O-002-017

has not explained why only the LPAs should be developed to a higher level, or why that updated analysis will not result in prejudicing the consideration of the other alternatives.

The alternatives analysis of the new information needs to be more fully developed.

The FEIS fails to fully consider alternatives as required by NEPA. By only providing an analysis of the LPA, along with the conclusory statement that most of the new information did not warrant updating analysis of the non-preferred alternatives,[63] the FEIS ignores the import of the alternatives analysis, which NEPA regulations describe, "as the 'heart' of the EIS."[64]

Further, even if *most* of the new information does not warrant analysis, if any new information demonstrates a substantial impact to the projected environmental effects of a non-preferred alternatives, CRC Project staff must disclose such information. This disclosure is pertinent to the process of public commenting and transparency. For example, "the conceptual stormwater treatment design used in the DEIS to analyze Alternatives 2 through 5 was updated for this FEIS, and since publication of the DEIS a more precise understanding of the project footprint and stormwater basins has been developed. If Alternatives 2 through 5 were reanalyzed using the updated stormwater design, they would provide water quality improvements similar to the LPA."[65] However, the other alternatives were not reanalyzed, so the public has no way to determine what "similar" water quality improvements might entail.

PEAC requests that the CRC Project staff perform a supplemental analysis in light of the new information for the non-preferred alternatives to adequately fulfill the obligation under NEPA of fully analyzing alternatives. Under NEPA, agencies must prepare supplemental EISs where there is "significant new circumstances or information relevant to environmental concerns

[63] FEIS at 3-334.
[64] *Kootenai Tribe of Idaho v. Veneman*, 313 F.3d 1094, 1120 (9th Cir. 2002) (abrogated on other grounds by *Wilderness Soc. V. USFS*, 630 F.3d 1173 (9th Cir. 2011).
[65] FEIS at 3-340.

O-002-017

and bearing on the proposed action or its impacts." 40 C.F.R. § 1502.9. The FEIS provides significant new information further developing the LPAs and bearing directly on water quality and other environmental issues.

Under USDOT Guidance documents, the FEIS must ensure that considering some alternatives in more detail will not prejudice the final consideration of the other alternatives.

Under USDOT guidance documents, the lead agencies of a proposed project "should evaluate carefully any proposal to develop a preferred alternative to a higher level of detail and consider the potential that such action has for creating a bias in the later consideration of alternatives and selection of the project alternative."[66] Further, other factors should be considered that may affect the environmental review process more generally. For example, the agencies should evaluate "whether the identification of a preferred alternative might have an unacceptably adverse effect on public confidence in the environmental review process for the project; whether that adverse effect on public confidence could be avoided by delaying the differential treatment of alternatives until a later point in the environmental review process; how the difference in level of detail among the alternatives might affect the presentation of the alternatives in the environmental documents; or the extent to which the proposed preferred alternative is supported by the results of public and participating agency involvement."[67]

Here, the FEIS fails to consider, or at the very least explain its consideration, of these factors. There is no indication that the FEIS considered whether bias would result by only further developing the LPAs' analyses. Further, there is no indication that the public perception of these alternatives was considered, given the overwhelming focus just on the LPAs in the

[66] UDOT SAFETEA-LU Environmental Review Process (Public Law 109-59) -FINAL GUIDANCE, 29 (November 15, 2006), *available at* http://www.fhwa.dot.gov/hep/section6002/index.htm.
[67] *Id.*

O-002-017

FEIS. This is inconsistent with USDOT guidance. If the FEIS intends to rely on 23 U.S.C. § 139(f)(4)(D) to allow it to duck its responsibility to consider all alternatives in the FEIS, then the FEIS should at least comply with USDOT guidance documents dealing specifically with 23 U.S.C. § 139(f)(4)(D) requirements. The FEIS must explain why further consideration of the other alternatives is not warranted, and ensure that this result will not prejudice the overall environmental analysis.

The FEIS fails to describe how mitigation efforts will reduce impacts to the water bodies.

O-002-018

NEPA requires that an agency include a discussion of mitigation measures in an environmental impact statement.[68] Incorporation of detailed mitigation strategies are required by law. The Supreme Court does not allow for the omission of details regarding mitigation strategies:

> Omission of a reasonably complete discussion of possible mitigation measures would undermine the "action-forcing" function of NEPA. Without such a discussion, neither the agency nor other interested groups and individuals can properly evaluate the severity of the adverse effects.[69]

The section concerning potential mitigation measures for adverse effects to water quality is wholly inadequate. The Water Quality and Hydrology Technical Report does not sufficiently disclose what mitigation measures will be imposed to prevent a significant environmental impact. The Report states that, "hydraulic analysis and a flood-rise analysis for the Columbia River structures would be conducted to ensure that there are no adverse effects of the project to the Columbia River's hydrologic regime."[70] This perfunctory description of mitigation measures and referencing future analyses in the FEIS is inconsistent with the "hard look" the CRC project

[68] 40 C.F.R. §§ 1502.14(f), 1502.16(h).
[69] *Methow Valley,* 490 U.S. at 352.
[70] Water Quality and Hydrology Technical Report for the Final Environmental Impact Statement at 1-16.

O-002-018

Mitigation under NEPA is considered to be those activities that avoid or minimize impacts, as well as those that are conducted as part of compensation. In this context, mitigation is discussed in detail in several locations. Pages L-19 through L-23 of Appendix L (Mitigation Matrix) of the FEIS provide a description of the mitigation measures proposed as part of the project. In addition, mitigation of water quality and hydrology impacts are discussed in detail starting on page 3-348 of the FEIS, in Section 6 of the Water Quality and Hydrology Technical Report, and as part of Appendix A of the Water Quality and Hydrology Technical Report. These sections of the document provide necessary details to analyze potential impacts due to stormwater quality and quantity.

Because impacts from water quality have been avoided or minimized, or likely improved in the long-term due to the capture and treatment of currently untreated stormwater, compensatory mitigation is not required for water quality issues.

A complete hydraulic analysis will not be performed until further design of in-water structure is completed. During subsequent phases of design, the piers will be designed in a way to produce no-rise or limit it, while still staying within the proposed footprint and providing sufficient support to the bridges. Should mitigation measures be necessary, a re-evaluation under NEPA could occur as appropriate.

O-002-018

staff are required to render under NEPA. Mitigation must be "in sufficient detail to ensure that environmental consequences have been fairly evaluated."[71]

Specifically, because Burnt Bridge Creek and Fairview Creek are more prone to be affected by increased impervious surfaces, it is essential that the FEIS disclose how mitigation will be implemented. Stating broadly that "[e]ngineered water quality facilities would be designed to reduce the rate of runoff," does not sufficiently fulfill the obligation to provide mitigation strategies as required by NEPA.[72] In addition, the FEIS states that much of the proposed mitigation is contingent on third party approval.[73] This fails to ensure that even the mitigation that has been disclosed in the FEIS will actually occur, or that the actual mitigation will be comparable to what is discussed in the FEIS.

The CRC Project Staff should prepare a Supplemental Environmental Impact Statement describing in detail the mitigation strategies to be employed. All major federal action should be halted until the hydraulic analysis and a flood-rise analysis for the Columbia River structures are performed. After incorporating the findings of these analyses, and the required comment period for the proposed SEIS, the public will be adequately informed, allowing for all of the environmental consequences to be fairly evaluated as required by law.[74]

The Long-term Effects section fails to provide adequate information.

O-002-019

The FEIS needs to describe what significant environmental impacts will occur as predicted by modeling. The FEIS should describe what the change in water quality will be for

[71] *Methow Valley*, 490 U.S. at 352.
[72] FEIS at 3-343.
[73] FEIS at 3-345 ("The LPA would not be constructed until state, federal, and local agencies approve the proposed impact minimization and mitigation methods.").
[74] *Methow Valley*, 490 U.S. at 352.

O-002-019

This comment has several elements related to stormwater quality, modeling, and treatment.

The FEIS and its associated documents provided an adequate analysis of stormwater impacts using available and accepted methods. Detailed pollutant-loading analysis by basin is included in the Water Quality and Hydrology Technical Report, with further clarification on page 3 of the FEIS Errata. Analysis of other pollutants and stormwater constituents might provide more details, but models of these pollutants are not available in the acceptable WSDOT-FHWA method. Other models have not been vetted for use in this area, and results would not necessarily be usable on this project.

Phosphorus modeling was included in the model used for the DEIS, but not in the FEIS. The model assumes that phosphorus is completely treated (reduced to 0) with the enhanced treatment techniques proposed as part of the project and as required in all WSDOT projects. Because all impervious surface in the project footprint and its CIA will be treated with enhanced treatment BMPs, phosphorus therefore could not be calculated in the updated WSDOT-FHWA model and would not need to be, given the assumption of its removal through enhanced treatment.

Retention ponds and wetland treatment systems are designed to filter stormwater, and to remain dry during periods of dry weather. WSDOT and ODOT maintenance staff are trained to identify areas of standing water and to address these issues through modifications of the facilities while retaining treatment thresholds.

With regards to the modeled 0.01 pound per year increase of dissolved copper, the amount of copper is minuscule relative to the drainage area. PEAC is correct in noting that dissolved copper is an inhibitor of olfactory function in juvenile coho salmon and other fish. However, the threshold

O-002-019

each water body involved, not just provide a determination that addition of pollutants will increase or decrease slightly.

Exhibit 3.14-4[75] does not adequately demonstrate to the public what environmental impacts may occur from all possible pollutant additions.

The FEIS states that total suspended solids and other pollutants entering the project waterways would decrease substantially in the main project area as a result of the construction of the LPA as shown in Exhibit 3.14-4. But exhibit 3.14-4 only addresses TSS, dissolved copper, and dissolved zinc. Inclusion of other pollutants in this analysis should be required. Due to sensitive habitats in the area, additions of other pollutants such as lead and phosphorus can have a significant impact to the environment and should be analyzed. The FEIS fails to provide this information.

The assumed stormwater treatment does not address long-term effects.

The FEIS states that under the LPA, "stormwater runoff from all existing, new or reconstructed impervious surface area within the CIA would be treated, while stormwater runoff from most of the existing PGIS does not currently undergo stormwater treatment."[76] The FEIS seems to describe stormwater treatment as the development of very large stormwater retention ponds, some surrounding the Rosemere neighborhood. Large bodies of standing water adjacent to residential areas is not healthy, and could result in mosquito problems. Rosemere has submitted various comments that groundwater mounding in the area has resulted in toxic buildup, and further injection or standing stormwater treatment ponds could contribute to the degradation of the creek as well as additional mounding. Yet, the FEIS includes mention of

[75] FEIS at 3-341.
[76] FEIS at 3-340.

for effect is thought to be approximately 1.5 to 5 mg/L. An increase of 0.01 pound equates to approximately 72.6 g. Over a 53-acre drainage area, this modeled increase is negligible, particularly considering that the majority of the stormwater would reside in drainage ditches and canals operated by MCDD prior to reaching any receptor fish. The CRC fulfilled its NEPA obligation to disclose known impacts, and to avoid, minimize, and mitigate where practicable.

The FEIS discusses total impervious areas on pages 3-341. Ruby Junction is not discussed in detail because its expansion will result in no new impervious surface associated with CRC, as stated on 3-342.

CRC acknowledges that even after treatment, pollutants from stormwater runoff may still be harmful to aquatic organisms. The statement that environmental conditions would be improved after retrofits is based on the fact that existing infrastructure allows stormwater runoff to flow completely untreated into streams. Treatment to current standards will improve water quality when compared to the same area that provides no treatment.

The commenter notes that the FEIS must take into account illegal pollution and failures by other entities to abide by their permits. These violations are not reasonably foreseeable events, nor can they be predicted with any certainty.

Cumulative impacts address basin-wide projects, as shown in FEIS Section 3.19.

O-002-019

injection. This fails to address the possible long-term effects of the proposed stormwater treatment and the concerns of the Rosemere neighborhood.

Analysis of the new and rebuilt impervious surfaces fails to analyze impacts under each of the non-preferred alternatives.

Exhibit 3.14-5 does not include information for all of the build alternatives. It is essential that the public can understand what the alternatives of the proposed action are, and what the differences are. This failure to provide analysis for each alternative frustrates the public's ability to understand the alternatives and their differences.

The FEIS fails to describe why the CRC Project staff is willing to accept environmental degradation as an option.

All federal action should consider impacts to the environment a significant factor in determining what projects to undertake. This FEIS demonstrates a possibility of pollutant loads increasing: "The Columbia Slough drainage . . . may experience a slight increase in dissolved copper under LPA Options A and B (0.01 to 0.02 pounds per year)."[77] At high concentrations, copper is acutely lethal to fish. Dissolved copper is a potent inhibitor of olfactory function in juvenile Coho salmon.[78]

The FEIS needs to more thoroughly analyze the impact of the proposed action to assess possible environmental harm. The FEIS needs to explain why the CRC Project staff is willing to allow increases in pollutants that may harm the Coho. As explained above, projected pollutant loads for each waterway should be included for all relevant pollutants. Even if the FEIS concludes that the loads are only slight, disclosure is still required. Slight changes to the chemistry of the water may have a significant impact. For example, the FEIS acknowledges that

[77] FEIS at 3-341.
[78] Baldwin, D.H., et al. *Sublethal effects of copper on coho salmon: impacts on overlapping receptor pathways in the peripheral olfactory nervous system.* Environmental Toxicology and Chemistry 22 (2003): 2266-2274.

O-002-019

the Columbia Slough does not meet Oregon State water quality standards for temperature, iron and manganese, and deicing materials that contribute to low levels of dissolved oxygen.[79] The FEIS needs to provide reasons why the staff is willing to allow environmental degradation as part of the project.

The FEIS needs to present the overall impact of the project as it relates to its existence in a dynamic ecosystem, and not just limit its disclosures to positively described outcomes and references to broad mitigation strategies.

The FEIS fails to summarize the actual amount of the total impervious area. In Exhibit 3.14.4, the FEIS demonstrates that the amount of impervious surface will increase due to the adoption of the LPA[80], but fails to explain why the Ruby Junction facility was not included in the exhibit. This is an area that will expand PGIS and the additions to this facility are within the scope of the project. The increase in impervious surface warrants full disclosure regarding impervious surface changes and the resulting impacts.

The Indirect Effects analysis does not adequately evaluate the current conditions of the water bodies. In the Indirect Effects section, the FEIS states that because all development that comes out of this project must comply with existing stormwater treatment regulations, the impacts to existing resources would be negligible.[81] However, regulations do not eliminate all pollutants; rather they decrease the amount that will impact the environment compared to if there was no mitigation at all. A large increase in pollutants in stormwater that has been treated could lead to a net increase of pollutants in waterways as compared to no build options. The FEIS needs to take into account illegal pollution and failures by other entities that may violate their

[79] FEIS at 3-337
[80] FEIS at 3-343.
[81] FEIS at 3-344.

O-002-019

permits, adding to the level of pollutants in the water bodies. Such an approach better complies with the protective measures that the Clean Water Act supports.[82]

The FEIS should disclose what the likelihood of certain pollutant loads will be. By stating that, "decreasing traffic congestion . . . *may* consequently reduce the amount of copper and other traffic-related pollutants currently carried by corridor stormwater runoff," the FEIS does not actually disclose the results of studies, but couches it in vague terms with the use of the qualifier *may*.[83] Such ambiguity prevents the public from being able to comment in an informed fashion.

The Hydrology analysis fails to aggregate effects.

The FEIS does not take into account other projects that may be occurring on the Columbia River. The cumulative impact of all projects could have a substantial effect on the water quality and hydrology of the water bodies. Cumulative impact, under NEPA, is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions."[84] In addition, "[c]umulative impacts can result from individually minor but collectively significant actions taking place over a period of time."[85] The FEIS improperly limits its cumulative impacts analysis to projects in the immediate project area rather than the watershed as a whole. In addition, the cumulative impacts analysis merely concludes that the "combination of impacts from the CRC project, regulations, and other foreseeable actions is likely to result in water

[82] 33 U.S.C. §1251.
[83] FEIS at 3-342.
[84] 40 C.F.R. § 1508.7.
[85] *Id.*

O-002-019 quality improvements relative to existing conditions" without analyzing the full range of cumulative impacts.[86]

The FEIS fails to adequately address impacts to Wetlands and Jurisdictional Waters.

O-002-020 ***Stormwater and other impacts are not adequately considered.***

The FEIS states that "[n]o project construction will occur in the Columbia Slough, Burnt Bridge Creek, or Fairview Creek waterways."[87] However, this is a false statement. The I-5 Corridor abuts the project footprint, and will be directly impacted by construction activities, including the development of stormwater treatment facilities, groundwater injection systems, and outfalls. Best Management Practices need to be implemented to diminish adverse impacts to natural resources.

Further, wetland buffers should not be ignored in analyzing impacts to wetlands. The FEIS states:

> The LPA project footprint would not encroach upon any delineated wetlands. However, the LPA footprint would encroach upon three wetland buffers: Victory Interchange (0.01 acre for LPA Option A and 0.05 acre for LPA Option B), Kiggins Bowl (0.3 acre), and Burnt Bridge Creek (0. 1 acre).[88]

Stormwater impacts have not been identified relative to wetland buffers. This means that the FEIS essentially conflicts itself, finding no impact to wetlands although buffer areas will be effected. The FEIS must disclose stormwater impacts on these sensitive areas, which are likely to affect the wetlands themselves.

[86] FEIS at 3-457.
[87] FEIS at 3-360.
[88] FEIS at 3-363.

O-002-020

The FEIS does correctly state that no construction will occur in the Columbia Slough, Burnt Bridge Creek, or Fairview Creek waterways. Construction will occur within the "watersheds" of these streams, but no construction will occur in the streams themselves. In addition, the project includes a portion of the I-5 corridor; it does not just abut it. BMPs would be implemented as part of the project as described in the FEIS, the Water Quality and Hydrology Technical Report, and Appendix A of the Water Quality and Hydrology Technical Report.

The FEIS is not contradictory in describing impacts to wetlands and wetland buffers. Both are regulatory defined areas, and no impacts within wetlands are anticipated. The project footprint does currently intersect with wetland buffer areas, although no stormwater treatment facilities are proposed to be constructed within wetland buffers.

References to the effects discussion for Burnt Bridge Creek are not clear. In particular, the statement that "impervious surface would not be sufficient to prevent all discharge to wetlands" is counter-intuitive. It is precisely because of impervious surfaces that stormwater treatment (both quantity and quality) must be dealt with at this site. The documentation of impervious surface area and treatment requirements are discussed in detail in the Water Quality and Hydrology Technical Report and Appendix A of this report.

With regards to the comment on long-term mitigation for ESA and other fish and aquatic species, the FEIS clearly states its mitigation commitments, including the implementation of mitigation and restoration activities at the Lewis River/Columbia River confluence and in the Hood River. In addition, impact avoidance measures including erosion and sediment control criteria are discussed.

The comment on flow control being necessary for MS4 permits draining

O-002-020

In addition, the FEIS states that "new impervious surface would not discharge untreated stormwater runoff into the wetlands, and the wildlife activities that may be impacted are already negatively affected by the urbanized environment."[89] However, impervious surface would not be sufficient to prevent all discharge to wetlands, especially near the SR500 interchange where multiple retention ponds are being planned. There is insufficient documentation to quantify the intense amount of stormwater that will be mobilized. To imply that Burnt Bridge Creek and its surrounding habitat is already doomed because of existing contamination is irresponsible, and undermines Washington State Department of Ecology's current program to establish a TMDL to remedy failed water quality standards for this urban stream. Taking the approach that new construction can't make anything worse is negligent.

The FEIS also admits that "[a]s with the existing bridge piers, replacement bridge piers in the Columbia River for the LPA may result in long-term impacts to aquatic species, including protected fish species."[90] However, there does not appear to be any discussion on how CRC plans to mitigate potential impacts to ESA species, including fish migration windows, turbidity control, and impacts from mobilized contaminants. Rosemere requested information from archives relative to the design and build of the Glen Jackson bridge, and CRC responded that no such records existed to cross compare construction impacts.

The FEIS concludes that "[t]he development and use of any of the staging and casting sites would meet all applicable stormwater requirements during and following utilization of the sites."[91] However, the FEIS has not identified which stormwater regulations are required, and

[89] FEIS at 3-363.
[90] FEIS at 3-364.
[91] FEIS at 3-366.

to the Columbia River and Columbia Slough is completely inaccurate. City of Vancouver, City of Portland, WA Department of Ecology, and OR Department of Environmental Quality have concurred that these receiving waterbodies do not need flow control treatments.

During the preparation of the Biological Assessment and consultation with NMFS, the potential for release of untreated stormwater was addressed in relation to its unlikely occurrence if permits and contract specifications were followed.

O-002-020

does not seem to be following NPDES mandates relative to flow control or MS4 usage piggybacking on other jurisdictional permits. Washington State requires flow control for all MS4 NPDES permittees. The CRC project will be using existing MS4 facilities within the City of Vancouver. Flow control is required per state law to all waters of the state, including the Columbia River. Yet, the FEIS states that flow control is not required for discharges to the Columbia Slough, North Portland Harbor, or the Columbia River.[92] It is in error to say that MS4 outflows are exempt from flow control standards. NPDES activities also have a direct correlation to ESA impacts, and such construction activity could result in a "taking" of protected fish habitat that would require remediation. There does not appear to be an analysis of these impacts involving NMFS, though it is acknowledged in passing.

Mitigation is not adequately addressed.

O-002-021

The CRC project must demonstrate how resources within the environmental overlay zones will be avoided and impacts will be minimized to the maximum extent possible; unavoidable impacts will require mitigation. This analysis is absent from the FEIS where it is required. Mitigation and avoidance under AKART is not included. This is a violation of NEPA mandates, and does not meet the standards of basic stormwater management requirements as prescribed by the Washington State Pollution Control Hearings Board. CRC's view that it cannot be penalized and held responsible for pre-existing conditions is a tactic to avoid compliance with current construction standards at the state level as well.

The mitigation site plan must demonstrate that the mitigation will replace all of the resources and functions affected and that a suitable mitigation site is owned by the applicant. It

[92] FEIS at 3-341.

O-002-021

The FEIS and its associated technical documents discuss in several places the measures taken to avoid or minimize impacts as required under local, state, and federal regulations. In those cases where impacts cannot be avoided, specific or conceptual mitigation measures are identified. The PEAC comment notes that "mitigation and avoidance under AKART is not included." The term "AKART" refers to "all known, available, and reasonable technologies". It is associated with State of Washington procedures completed during permitting, particularly in association with treatment of stormwater runoff. It is not a necessary element of the NEPA analysis. Nevertheless, the CRC project has completed preliminary phases of AKART through identification of known and reasonable technologies, a literature review, modeling of existing conditions, and screening of feasible alternatives, but has not used the “AKART” acronym in the FEIS. With respect to stormwater facilities, information adequate for FEIS-level review is present in the Water Quality and Hydrology Technical Report and its Appendix A. The CRC project has not attempted to establish its own standards for how compensatory mitigation can proceed. The use of a mitigation site and accounting for functional assessments is a highly collaborative process with multiple resource agencies. CRC has routinely met with regulatory agencies since 2005, providing project information and soliciting feedback on avoidance and minimization measures. Where impacts cannot be avoided, mitigation (including sites, values, and activities) were discussed with this agency group. While some regulations and procedures prioritize mitigation that is on-site and in-kind, recent policies and trends in permitting and mitigation have recognized the problems with this approach and have instead encouraged off-site and out-of-kind mitigation if that provides greater benefit such as better connectivity, higher priority functions, or other benefits. It is in this context that the state and federal resource agencies rated the Lewis River confluence project and Hood River channel reconnection project as high priority compensatory mitigation for the CRC project. Permanent in-water

O-002-021

appears that CRC's intent is to pillage in the existing construction footprint with the expectation that all will be forgiven by investing in a wetland bank. This should not be allowed. The FEIS states:

> The compensatory mitigation ultimately selected will be based on a functional assessment of adverse effects and replacement of equivalent functional value. The project mitigation will provide meaningful improvement in the size, amount, distribution, and quality of habitats relative to that which existed prior to implementation of the CRC project."[93]

This implies that CRC will establish its own standards on how it will determine where and when to employ mitigation work. Standards require mitigation be employed in the same kind of habitat under the same environmental conditions to ensure equal compensation, and CRC has not conducted area wide surveys to categorize habitat types that will be impacted, nor have they analyzed how the habitats will be valued per jurisdiction. Mitigation should be required within the same watershed at the subwatershed level, not at some distant undisclosed location, and the acre per acre ration is absent from the description. There is a passing mention of the "no net loss" scenario, but water flows in natural streams have not been identified to determine what "no net loss" is in actual terms, including those waterways listed for impairments. There are vague ratios provided for open water issues, but not for habitat issues, riparian buffers, or wetlands. CRC has identified an undisclosed Lewis River mitigation area, but this is at the opposite end of the county. The Columbia River in Vancouver is being affected, and the Lewis River mitigation idea is far too removed to be of any good to the impacted area.

The Troutdale Sole Source Aquifer Technical Report is outdated and insufficient, rendering those sections that rely on it inadequate.

[93] FEIS at 3-367.

impacts from the CRC project are approximately 1.5 acres of fill (bridge foundations), mostly in deep water areas of the Columbia River. The project could replace this relatively low priority and low value habitat with similar in-kind and on-site mitigation. However, this is an opportunity to mitigate with much higher value habitat in locations that will provide much greater benefit to salmon and other affected species such as smelt and lamprey (i.e., shallow water rearing habitat). The details on the Lewis River confluence and Hood River sites are located in Section 6 of the Ecosystems Technical Report.

O-002-022

Rosemere hit the high points of concern about the sole source report with comments submitted last year.[94] The concerns raised by Rosemere have been ignored, though they have

[94] The comments noted herein do not represent all of Rosemere's concerns, but begin to address substantial issues:
1) First, the report focuses on construction related impacts, and CRC appears to justify this focus as something specifically requested by EPA's July 2008 letter. We view EPA's letter more as a request for detailed groundwater characterization and discussion of potential impacts on the groundwater in the project area. This is not what CRC provided.
2) Long term impacts and benefits from storm water management should be evaluated – CRC only provides one paragraph. Currently, little stormwater is infiltrated in the project footprint (primarily in areas that will be added to the impervious surface). After build-out, a substantial proportion of the storm water will be infiltrated. Benefits of this are groundwater recharge. Impacts could be mobilization of on/off- site contaminants caused by a higher water table and/or changes in groundwater flow direction and rate caused by infiltration created groundwater mounds. There are noted groundwater mounds, some of which are known to be contaminated, within the Burnt Bridge Creek Basin. This is in addition to possible introduction of contaminants due to inadequate stormwater treatment.
3) The hydrogeologic characterization seems incomplete and general. Site specific detail is lacking which is important for a several mile long area which is likely to have local variations that could be affected by the planned focused infiltration of groundwater. Specifically, CRC only provides an outdated and very general groundwater contour map. They do provide a detailed depth to groundwater map taken form Clark Co GIS although this is again is outdated from 1995. Instead, calculations should have been included to subtract the topography and provide a detailed groundwater elevation map. An additional source could be the referenced groundwater model. The model should have been compared to actual groundwater levels to validate it's accuracy so both measured and modeled representation of the groundwater contours should be available. This is important because the description of groundwater flow is very general without this level of detail. Flow rate is not discussed, except in reference to modeled travel times to wells (1 to 5 years, very short). CRC should employ their own model and run their own groundwater mobility scenarios.
4) The characterization of Burnt Bridge Creek is questionable, and this is important because it defines the northern area of the project. The report states the creek is underlain by low permeability conditions because groundwater levels are lower to the south, but there is no evidence provided to qualify this statement. At a minimum, boring logs (along I-5) should be provided as well as detailed groundwater contours. It is just as likely that the lower groundwater levels to the south are caused by pumping at WS-3 and the lower topography than an undocumented lithologic change. Therefore, additional characterization is needed to clear this up.
5) There is an indication that stormwater cannot be treated and infiltrated from the area between Mill Plain Blvd. and Fourth Plain Blvd. because the storm drain is too deep. There should be a better answer to this problem than the mere claim that infiltration cannot be achieved, and more effort needs to be made to find an appropriate resolution to this problem.
6) The city of Vancouver's local CARA ordinance is mentioned, but there does not seem to be a

O-002-022

The CRC FEIS and its associated reports, including the Troutdale Sole Source Aquifer report, provide the most up-to-date, verifiable information available at the time of publication. These were prepared in coordination with EPA. Construction activities are the potential impact pathway of concern.

Burnt Bridge Creek would not be impacted and therefore is not studied in detail. The project has identified potential for impacts and proposed measures to isolate known or potential contamination from reaching groundwater. PEAC notes that additional studies have been performed by CRC and others. These results have been incorporated into the most recent designs for structures and stormwater facilities as described in the FEIS.

PEAC has commented that the bridge footprint in itself is comprised of a liquefaction zone. Potential liquefaction of soils from construction activities were not addressed in the FEIS. Based on the results found in Section 5.2 of the In-water Test Pile Program Vibration and Sound Monitoring Final Report (http://columbiarivercrossing.com/FileLibrary/TechnicalReports/CRCTestPileAcousticVibrationReport.pdf) from July 29, 2011, impact and vibratory installation of pile could not be detected above ambient levels at several locations (including the existing bridge towers), while one monitor did detect vibrations on Hayden Island. Based on the finding on page 6-1 of the report that “[g]round vibration amplitudes are expected to be well below the amplitudes necessary to cause any damage to structures” this project element did not rise to a level where discussion in the FEIS was warranted.

O-002-022

technical merit, and EPA does not appear to be seeking answers. Because the FEIS chapters on Water Quality and Hydrology and Geology and Soils seem to replicate the Troutdale Sole Source Aquifer Technical report almost verbatim, these comments pertain to the noted chapters as well.

The Sole Source Aquifer Technical Report is clearly out of date and lacks sufficient detail in the designated protected area. Several years of drilling have occurred which should give much more detail to the lithologic model. CRC project staff has had plenty of time to gather water level data, analyze this data and present a clearer understanding of ground water flow. The Ground Water remediation efforts at the Swan Manufacturing site should be revisited now that they have a couple years of operational data. This should include recalibrating the CRC groundwater model, but it does not. The Swan manufacturing site is being treated under supervision of the Washington State Department of Ecology, so there should be better data available for CRC to use – however CRC's FEIS fails to identify existing baseline studies for consistent analysis.

Further, the reports do not address the currently proposed project – there is a new alignment over the river, a different design implemented, and the SR500 interchange has been removed. There are various blanket statements that are not specific enough to address the noted changes in design. The statement that finer grained material at Burnt Bridge Creek reduces

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plan to engage with the City of Vancouver on this subject. Since the CARA ordinance states that all infiltrated stormwater will enter drinking water wells in less than 5 years, it seems like Vancouver should be directly involved. Vancouver might want to engage on is integration of stormwater improvements in the surrounding area with the CRC project. CRC seems to be strictly isolating itself form it's surroundings where integration might serve the community well, including enhancing recharge of city well fields. After construction such improvements may be impossible. Collaboration is needed here, not isolation.
7) The referenced groundwater model is interesting, but one figure seems incomplete. A couple wells don't seem to be turned on in the
model (Great Western Malting) which would affect the result. The model identifies 35 wells in the area, but they are not all accounted for in the model.

O-002-022

infiltration south of the creek is questionable. Of course there is infiltration south of the creek, and CRC plans to use this capacity to infiltrate storm water. The notion that recharge occurs in the Cascades is irrelevant and the modeled flow lines to municipal well WS-1 appear to show the overwhelming importance of local recharge to the primary use of groundwater under the project. The flow lines appear to show that the project area will essentially control water quality at municipal well WS-1, and to some extent water quantity. Yet, CRC maintains that there are no impacts to the aquifer, even though direct impacts are expected at municipal wells. This is a very important conflict that needs to be resolved in order to prevent adverse impacts to Vancouver's water supply.

In addition, it makes storm water treatment and infiltration extremely important. CRC's statement that in the summary that "Improved storm water quality is *thought* to help improved surface water and groundwater quality over time" is alarming. A more affirmative statement based on experience would give more confidence. Stormwater treatment and infiltration is extremely important. There is a fair amount of discussion about stormwater management but it is lacking in detail. There is going to be a lot of runoff and some quantification of the amount of pollutants CRC expects and the capacity of the proposed treatment methods would give more confidence that they have a handle on this. A casual look at the pond near the foot bridge over I-5 shows what the concerns are. Fortunately they describe this pond as a detention pond not suitable for treatment.

One thing that is not identified is the affect of ground shaking during pile driving. CRC does state that they consider an alteration of "the physical characteristics of the groundwater resource" an adverse affect on the Troutdale Sole Source Aquifer. The bridge footprint in itself is comprised of a liquefaction zone, a seismic hazard, which is a primary

O-002-022

justification for needing a new bridge. There does not seem to be analysis of ground shaking during pile driving, and how that could impact liquefaction. Because the UGA and alluvium in the area are unconsolidated, ground shaking could alter the physical characteristics. It is conceivable that this could mobilize contaminants or damage municipal wells. For example, PCE is present in the groundwater from municipal well WS-1 from an unknown source. PCE could be mobilized by consolidation induced by ground shaking. Rosemere has brought this to the attention of the EPA on several occasions, yet these concerns have been dismissed, even though there are various artesian upwellings in the footprint area that directly impact the water supply. Vancouver should be very concerned about this.

The general impression is that CRC recognizes that the aquifer is vulnerable but it is questionable whether they have a sufficiently detailed understanding of the aquifer and flow system and the potential impact to groundwater. The main long term concern is storm water treatment which CRC seems to treat as an engineering problem to be addressed at a later time. Generally it is good for the water supply to infiltrate stormwater, however this must be done well to avoid reduction of water quality. Contaminants of concern could be directly disturbed by construction. The potential affect of vibration should at least be acknowledged with references to other projects where there was a substantial amount of pile driving.

This is also of concern in the Hayden Island area where pile driving will occur down more than 200 feet, piercing the aquifer through toxic landfill, all within proximity to residential areas on the island. This item has not been sufficiently addressed, although CRC has been conducting core soil samples over the past year. The results of those samplings do not appear to be included in overall analysis of these concerns, and EPA has failed to follow up on these concerns. Instead, EPA offers the opinion that all documents provided by CRC are "adequate"

O-002-022

unless consultants need to be hired for more specifics. This does not make sense relative to the potential for adverse impacts. Due diligence has not been performed here and Rosemere's previous comments have been ignored.

AIR QUALITY

Flawed Underlying Assumptions Condemn the Air Quality Analysis.

O-002-023

Any projection of what will happen in the future must be based on assumptions. In the current economic and environmental climate in the greater Portland Metro Area, we cannot waste scarce transportation dollars on false assumptions. CRC uses an assumption that air pollution decreases in the project area to avoid any discussion of the impacts on air quality and public health of this massive road-building project. As discussed in numerous comments on the traffic analysis for the CRC, those assumptions are incorrect.

The FEIS follows the DEIS in its reliance on Metro's 2035 Regional Transportation Plan (RTP). The RTP is only workable after underestimating future traffic projections and assuming no growth. In fact, the CRC project team previously asserted:

> [T]he [Metro] modeling indicated that fewer trips would cross the river and the duration of congestion would be substantially lower with the project. The air quality modeling presented indicates that fewer trips combined with less congestion would reduce pollutant emissions relative to the no-build. The induced growth analysis indicated that the project would be very unlikely to result in induced sprawl.[95]

The CRC project team fails to provide any explanation or analysis to support Metro's modeling, but instead continuously repeats Metro's predictions. The CRC project team unjustifiably uses Metro's modeling results as the project's go-to answer for almost any air quality concern raised.

The FEIS ignores that, at best, the CRC shifts congestion from the North Portland and Vancouver area into the Portland city center and north of Vancouver. No discussion is provided

[95] DEIS Comment Response to O-035-087.

O-002-023

CRC stands by the traffic numbers and subsequent air quality results. The air quality FEIS section and technical report analyses were developed and approved through an interagency consultation and relies on sound and established practices for the analysis. The FEIS and technical report disclose the impacts from various pollutant, indicates historical and expected trends in impacts, and considers differences in the future impacts. Since the emission differences between build and no-build scenarios are so small and are much smaller than the projected reductions due to regulations and technology, the additional evaluations contain large uncertainties and would have questionable benefit.

PEAC comments that "sources may increase their emissions at any time to allowable levels without undergoing any further permit review or the installation of new technology", and somehow will results in a NAAQS violation that CRC has not considered in detail. However, large stationary sources both up and downwind of the CRC project have shutdown and their emissions removed from the air shed. New sources and many existing sources have to demonstrate compliance with the NAAQS in order to get their permits. Thus, CRC presumes that any new or modified source being brought into the air shed will have demonstrated compliance with the NAAQS. Furthermore, with emissions reductions in effect, the future mobile emissions levels in the CRC project area will be lower, further leading to improvements in the air shed. The CRC project is not responsible for speculating on how other emissions sources may or may not impact the NAAQS.

Concerning ozone, the TSD notes: "On a regional basis, differences between the future 2030 emissions for project alternatives, including the No-Build Alternative, are 1 percent or less, which is not a meaningful difference." Thus, CRC's contribution to ozone is essentially too small to make a difference in terms of compliance with the NAAQS and in terms of health impacts.

O-002-023

on how the CRC will impact neighborhoods surrounding I-5 south and north of the project area, or in those sections of the project area where interchange improvements will drive more and heavier traffic farther away from I-5.[96] At worst, the CRC will enable a massive increase in car, light truck, and heavy truck traffic.

Even if the CRC's conclusion that traffic will not increase proves true, the FEIS' air quality analysis looks to area-wide air quality for year 2030 – ignoring the next 29 years. In 2030, air quality in the project area is projected to improve, due to in large part to regulatory requirements and advanced technology. The FEIS states, "Recent regulations, including those for fuel formulations, help control emissions from heavy-duty diesel on-road and off-road vehicles. New gasoline reformulation rules should substantially reduce benzene emissions. These standards are expected to continue reducing pollutants in vehicle emissions over the next 25 to 30 years." FEIS at 3-276. These improvements, if they happen at all,[97] would occur gradually

[96] Both the DEIS and the FEIS provide emissions analysis for four subareas adjacent to I-5. The project team identifies the four selected neighborhoods as: (1) NE 99th St. and E 39th St. in Vancouver, (2) E 39th St. to State Route 14 in Vancouver, (3) State Route 14 to Columbia Blvd. in Portland, and (4) Columbia Blvd. to the I-405 junction in Portland. However, neither the DEIS nor FEIS explain how or why the project team selected these specific neighborhoods as opposed to other neighborhoods along I-5. In particular, the FEIS should have included information on pollution impacts north and south of the project area, where the congestion now experienced along the Interstate Bridge will occur. The multi-lane project area will have a far greater number of lanes than I-5 north and south of the project area. Thus, while cars and trucks may have plenty of room to cross the river at 70 MPH, congestion will be experienced both north and south of the bridge where the road will remain 4 to 6 lane interstate with a speed limit of 50 MPH.

[97] One need not look far to find evidence that projections of future regulatory improvements (i.e. pollution reductions mandated by any government authority) are almost always too optimistic. *See* Statement by the President on the National Ambient Air Quality Standards (September 2, 2011) (withdrawing the final Ozone NAAQS revision that would have been more protective of public health and the environment); HR 2401 and 2584, Sec. 462 (2011) (delaying or eliminating EPA rules to protect the environment from air pollution); E&E Daily, Green groups say Senate MACT bill worse than House version (July 21, 2011) (proposed senate bill would postpone or eliminate hazardous air pollution standards for ubiquitous "industrial boilers" and utilities); EPA, Light Duty Automotive Technology and Fuel Economy Trends: 1995 -2007 (September 2007) (noting a decrease in fuel economy from 1987 – 2004).

PEAC incorrectly asserts that the ambient benchmark concentrations (ABCs) are standards that CRC ignores. ABCs are defined in the Oregon State Air Toxics Program rule (Division 246, 340-246-0090) as:

Purpose. Ambient benchmarks are concentrations of air toxics that serve as goals in the Oregon Air Toxics Program... **Ambient benchmarks are not regulatory standards**, but reference values by which air toxics problems can be identified, addressed and evaluated. (emphasis added).

Oregon's Air Toxics Program address toxics by geographical area (like PATS), by source category (like mobile sources) and by safety net program for selected stationary sources. Thus, application of ABC's to individual projects like CRC is not intended in the Oregon Air Toxics Program. Furthermore, MSAT reductions are obtained by addressing statewide vehicle emissions rather than attempting to squeeze small and likely insignificant reductions specific projects.

Since Harriett Tubman Elementary School is adjacent to I-5, just a few miles from the CRC project, it represents representative sample of likely impacts within the project area. Furthermore, ABC's are based on a annual averaging time where the Harriett Tubman samples are a 24-hour concentrations. Therefore the direct comparison of 24-hour sampled concentrations to the ABC's is not appropriate. Difference in MSAT emissions between the build and no-build scenario is small, within the range on uncertainty. Thus, any major progress in reducing MSAT will likely come from vehicle emissions and not from a single project.

Under the transportation conformity rules (40 CFR 93.123 (c)(5)):

(5) CO, PM_{10}, and $PM_{2.5}$ hot-spot analyses are not required to consider construction related activities which cause temporary increases in emissions. Each site which is affected by construction-related activities

O-002-023

over this period. Impacts to air quality and human health would still be a factor in the interim. Similar to the DEIS, the FEIS does not acknowledge this because it fast-forwards to year 2030 with its projections.[98] No indication exists that 2030 will have the greatest air pollution impacts of all the years between now and 2030. In fact, it is reasonable to assume that the years with serious traffic disruptions will result in more air pollution than in 2030. By choosing 2030 as the relevant model year, the CRC project team underestimates several decades of impact on the communities surrounding I-5.

It is a truth universally acknowledged that all models are wrong, but some models are useful.[99] The longer the time period covered by the model, the more wrong it is likely to be. Considering the serious deficiencies of the model outlined in comments on the traffic projections, the air quality analysis might give those living in the CRC project area comfort, but fails to meet the NEPA standard to examine the environmental impacts of a proposed action. The EIS must describe the relevant pollutants, the *range* of expected concentrations, and the health and environmental impacts of those concentrations.

CRC failed to adequately respond to PEAC's DEIS comments.

The CRC project team failed to adequately respond to several of PEAC's concerns expressed in its DEIS comments. First, in Section O-035-088, PEAC commented that the DEIS "fails to consider the health effects of exposure to multiple criteria air pollutants and air toxics, and their possible synergistic effects." The authors of the response answered

> [T]he DEIS did consider these issues, Pages 3-275 through 3-277 and Section 3.10.2 explain, and the Air Quality Technical Report (Section 4.2.2 and 5.2)

[98] Analyses that focus on 2030 impacts: Regional NAAQS and MSAT Emissions projections, Subarea NAAQS and MSATS Emissions projections Maximum One-Hour and Maximum Eight-Hour Carbon Monoxide Concentrations Analysis, and the Intersection Ranking and Hotspot Analysis.
[99] With apologies to George E. P. Box and Jane Austen.

shall be considered separately, using established "Guideline" methods. Temporary increases are defined as those which occur only during the construction phase **and last five years or less at any individual site**.

Although construction will last more than 5 years, project construction activities at any one site are not expected to last more than 5 years. Thus, a CO hot-spot analysis was not conducted. Since the area is in attainment for PM_{10} and $PM_{2.5}$, a PM hot-points analysis was not required.

The air quality research conducted during the construction of the Dan Ryan Expressway is very relevant to understanding the likely impacts of CRC construction. The Dan Ryan project involved construction of a transportation facility with elements very similar to the CRC project, in an urban environment and through a wide range of meteorological conditions. The study spanned several years and included many samples covering many different types of construction equipment, and types and levels of construction activity. Through several years of construction, the monitoring did not detect any elevated concentrations that were directly related to the project. The CRC project is expected to have half the volumes of the Dan Ryan project. This information from the Dan Ryan project monitoring research supports the conclusions that CRC construction is not expected to cause any air quality violations and will not pose undue risk to the nearby communities.

See also responses to EPA's comment letter F-001-003 for additional discussion of air quality.

O-002-023

> further details, the relevance of such air-quality-related health risks to the project, including the known limitations and uncertainties of current science and methodologies, the information, findings and relevance of the Portland Air Toxics Assessment study, and the approach developed and implemented in coordination with regulatory agencies to address these concerns. Please see Chapter 3 (Section 3.10) of the FEIS and the accompanying Air Quality Technical Report for an updated discussion of these issues.

Needless to say, this overbroad response failed to resolve PEAC's concern. The pages referred to in the DEIS did not discuss the health effects of exposure to multiple criteria air pollutants. While each criteria air pollutant is now at least mentioned in the FEIS, the FEIS still does not address the health effects of multiple criteria air pollutants. Furthermore, the fact that the FEIS acknowledges that Volatile Organic Compounds and nitrogen dioxide contribute to the creation of ozone does not address PEAC's concern. Thus, the CRC project team failed to adequately respond to PEAC's comments in Section O-035-089 of the DEIS.

Next, PEAC raised concern in its comment about how the CRC project team avoids analyzing the effects of criteria pollutants. Specifically, in Section O-035-099, PEAC noted how "the DEIS essentially equates compliance with the NAAQS with a sufficient analysis of the air quality impacts of the project." In response to this, the authors state that

> The DEIS and Air Quality Technical report indicate that regional pollutant emissions from vehicles will continue to decrease in the future even though VMT increases, suggesting air quality will improve in the future. This is supported by air quality monitoring conducted by the state air quality agencies that shows most pollutant levels have decreased over the last ten years.

This response completely ignores PEAC's concern that the DEIS uses NAAQS compliance as a substitute for an analysis of the air quality impacts of the project. Thus, this response is inadequate.

The CRC improperly provides significant new information without completing an SEIS.

O-002-024

While the FEIS does provide new material to resolve uncertainties, it is not appropriate to introduce an overwhelming amount of new material in an FEIS. In such a situation where the CRC project team must introduce a vast amount of new material, the need for a Supplemental EIS (SEIS) is obvious. Nevertheless, the CRC project team failed to issue an SEIS. The Air Quality section explicitly introduces new information including: (1) a revised list of project area intersections with the greatest potential to experience air quality effects, (2) air toxics monitoring data from the Harriet Tubman Elementary School in Portland, (3) a study on the temporary impact of a comparable construction project, (4) updated MSAT emissions and concentrating models, (5) new guidance from the FHWA on the list of MSATs to analyze, and (6) new guidance from ODOT for mitigating construction impacts. Furthermore, the CRC project team illegitimately uses some of this new information to dismiss public concerns, which the public raised regarding the DEIS. Also, many of the FEIS adjustments still act as blanket assertions and conclusions without providing any meaningful analysis. This fails to meet NEPA requirements.

CRC's analysis of criteria pollutant impacts and conformity do not satisfy NEPA's mandate to evaluate impacts from the proposed action.

CRC's NAAQS analysis is insufficient to disclose and analyze the impacts of air pollution.

O-002-025

The CRC claims that "An air quality impact would occur with a violation of the NAAQS or SAAQS."[100] Thus, the CRC continues the fatal flaw of its DEIS – equating NAAQS compliance with a discussion and analysis of "impacts" under NEPA.

Criteria pollutants under the Clean Air Act are pollutants that EPA has determined "cause or contribute to air pollution which may reasonably be anticipated to endanger public health or

[100] Air Quality Technical Report at 2-2.

O-002-024

The information and updated emissions estimates added to the air quality section of the FEIS did not change any of the fundamental conclusions regarding impacts, the comparison of alternatives, regulatory compliance or conformity. The most substantive change to the air quality section was that the FEIS includes more detail than the DEIS regarding mitigation measures during construction.

O-002-025

Please see responses to comments O-002-023 and O-002-024 above.

O-002-025

welfare."[101] To date, EPA has made "endangerment findings" for six pollutants: particulate matter (PM, PM_{10}, and $PM_{2.5}$), ground-level ozone (O_3), sulfur dioxide (SO_2), nitrogen oxides (NO_x), lead (Pb), and carbon monoxide (CO). Once EPA makes an endangerment finding, EPA must then develop "air quality criteria" for that pollutant.[102] The criteria is intended to accurately reflect the latest scientific knowledge about effects on public health and welfare that can be expected from various levels of that pollutant in the ambient air.[103] Once the criteria are established, EPA must set National Ambient Air Quality Standards (NAAQS) to protect human health and welfare.[104]

The Clean Air Act requires that EPA establish an independent scientific review board (the Clean Air Scientific Advisory Committee or CASAC).[105] Every five years, the EPA and CASAC must review the criteria and the NAAQSA to ensure that they continue to protect public health and welfare based on the latest science.[106] If warranted, EPA must make revisions to criteria and promulgate new standards for each listed pollutant.[107] EPA is also required to involve the public in the criteria development and NAAQS review process by publishing notice in the federal register and reviewing public comments.[108]

Nevertheless, criteria pollutants often pose significant health threats even when ambient concentrations are at or below the national standard for three reasons. First, EPA does not

[101] 42 U.S.C. § 7408.
[102] *Id.*
[103] *Id.*
[104] 42 U.S.C. § 7409.
[105] 42 U.S.C. § 7409(d)(2)(A).
[106] 42 U.S.C. § 7409(d)(1) & (2)(A).
[107] 42 U.S.C. § 7409(d).
[108] 42 U.S.C. § 7607(d).

O-002-025

comply with its duty to review the criteria and NAAQS every five years.[109] Second, EPA has on at least two occasions rejected the NAAQS levels that CASAC has recommended as requisite to protect public health and welfare. Third, for some criteria pollutants, there is no level under which the population will experience "no impacts." Simply put, the more pollution present in the ambient air, the more death and disease associated with the exposure, even if the NAAQS are satisfied.

While PEAC did raise these concerns in its DEIS comments, it bears repeating since the CRC project team marginalized these concerns by stating that the project was compliant with NAAQS and nothing more could be done. Moreover, PEAC's concerns are highlighted by significant controversy around updated NAAQS that has continued since the DEIS was released in 2008.[110] While delays continue to plague the implementation of the final NAAQS revision for ozone, all available scientific evidence points to a significant revision downward of the ozone standard. Under an appropriate ozone standard, the project area is likely to be in non-compliance with the NAAQS, and the pollution increases occasioned by either construction related emissions or increased car and truck emissions, will pose an undue health threat even considering the CRC's false reliance on NAAQS compliance to demonstrate "no effects" under NEPA. If the

[109] *See American Lung Association v. Reilly*, 962 F.2d 258, 263 (2d Cir. 1992) (failure to review NAAQS for ozone); *Environmental Defense Fund v. Thomas*, 870 F.2d 892, 900 (2d Cir. 1989) (failure to review NAAQS for sulfur dioxide), *cert denied sub nom. American Lung Association v. Browner*, 884 F.Supp. 345, 346 (D. Ariz. 1994) (failure to review NAAQS for PM); *Center for Biological Diversity v. Johnson*, Civ. No. 05-1814 (D.D.C. filed 2005) (failure to review NAAQS for nitrogen oxides and sulfur dioxide); *Communities for a Better Environment v. EP*A, Civ. No. C 07-03678 JSW (N.D. Cal, May 5, 2008) (failure to review NAAQS for carbon monoxide).

[110] *See* Statement by the President on the National Ambient Air Quality Standards (September 2, 2011) (withdrawing the final Ozone NAAQS revision that would have been more protective of public health and the environment); HR 2401 and 2584, Sec. 462 (2011) (delaying or eliminating EPA rules to protect the environment from air pollution – including updated NAAQS) in Air Quality Citation Sources Folder.

O-002-025

CRC depends upon future regulatory action to demonstrate that pollution will go down, the CRC must also account for future regulatory action revising the NAAQS downward to reflect the scientific consensus that the Ozone and PM2.5 NAAQS are inadequate to protect public health and welfare.

Ignoring both the underlying scientific debate and the reality, adequately explained in PEAC's DEIS comments, that health and welfare impacts are experienced at pollution concentrations under the NAAQS, the CRC project team responds that "conformity rules state that the project must not cause or contribute to a violation of the national ambient air quality standards (NAAQS)."[111] Then the CRC project team asserts that "the project cannot arbitrarily set its own 'standards' under the current regulatory environment."[112] This assertion, without any explanation, assumes several faulty premises. First, the CRC project team does not provide any legal justification that precludes the team from disclosing impacts from air pollution in a NEPA document. Rather, the team simply says it cannot adopt standards because the NAAQS exist. The question, for NEPA purposes, however, is not whether the proposed action will meet regulatory standards, but whether the impacts of the project are adequately considered by the agency before making an irretrievable commitment of resources to a course of action.

Moreover, this response ignores that the Air Quality Technical Report does not reflect an analysis of whether the project area will attain and maintain the NAAQS. The Technical Report simply estimated the emissions associated with each project alternative and compared that to baseline. The logic seems to be that the project area is currently in attainment or maintenance of all the NAAQS as demonstrated by historical monitoring used for area designations under those NAAQS, thus is on-road mobile emissions are reduced in 2030 by the project (or under the no

[111] DEIS comment Response O-035-097.
[112] *Id.*

O-002-025

build alternative), the project must maintain the areas attainment status. Putting aside the many false assumptions in the traffic and regulatory analysis that results in the conclusion that on-road emissions will go down by 2030, the type of analysis in the Air Quality Technical Report proves nothing, and certainly does not demonstrate that the project area will experience "no effects" from the proposed project.

The Technical Report analysis depends upon the historic monitoring used to assess compliance with the NAAQS when area designations for those NAAQS first took place, and upon the limited ongoing monitoring for those pollutants. First of all, adding future project emissions to historic monitoring results cannot yield useful information about future compliance with the NAAQS because it does not account for permitted emissions that were not being emitted during the monitoring periods. That is, under the Oregon State Implementation Plan (SIP) programs regulating stationary sources, sources may increase their emissions at any time to allowable levels without undergoing any further permit review or the installation of new technology. The allowable emissions are set with reference to allowable emissions in some prior year, most commonly 1977 and 1978. Any stationary source with a permit limit set based on baseline emissions from 1977 and 1978 can increase its emissions up to that level.

Thus, historic monitoring results only indicate the air quality at that particular point in time based on what sources were operating at a particular level (often, not its allowable level). Therefore, the logic of simply comparing pre-project mobile emissions with post-project mobile emissions and concluding that the project will not cause or contribute to a violation of the NAAQS simply doesn't work in Oregon. Pollution may increase from other sources at any time, throwing an attainment area into nonattainment because increases are already authorized by permits. The Technical Report does not explain how its logic would apply if the area

O-002-025

experiences increases in pollution from other sources. Without undertaking a more sophisticated analysis, the TSD's conclusion that the project will not cause or contribute to a violation of any NAAQS is unsound.

Second, the CRC project team ignored other applicable standards, the Oregon Ambient Benchmark Concentrations. Indeed, the FEIS fails to discuss the health impacts expected from increased toxic air pollution, either from construction, congestion caused by construction, or the alteration of traffic volumes and locations as a result of the proposed action.

In addition, this simplistic "analysis" fails to seriously consider whether the project area will attain the new NAAQS that it identifies in exhibit 2-1 of the Air Quality TSD. The TSD recognizes that ozone status could change depending on what final ozone standard is adopted by EPA, yet it undertakes no further study of increased NOx emissions from roadways. Furthermore, the TSD notes that the monitoring stations that are monitoring NOx are not within a meaningful distance from the roadway, and further monitoring is needed.

Moreover, the NAAQS serve as a floor, not a ceiling. The existence of NAAQS does not prevent the CRC project team from disclosing impacts from pollution even where the NAAQS are attained. Particularly where there is great scientific controversy regarding the levels at which some NAAQS are set, such as is the case with ozone, the CRC must consider the significant health impacts that will occur at levels below the NAAQS.

Recently, EPA determined that the 8-hour Ozone NAAQS is inadequate to protect human health and the environment. 75 Fed. Reg. 2938 (Jan. 19, 2010). Specifically, EPA found that "children and adults with asthma and other preexisting pulmonary diseases are at increased risk

O-002-025

to the effects of O3 exposures." Draft Final Decision at 45.[113] The new 8-hour standard was expected to be adopted during the summer of 2011 and EPA was expected to set the new standard between 0.060 and 0.070 ppm.[114] Adoption of the final Ozone rule was delayed by the Obama administration due to concerns about the economic costs of the rule – not its health ramifications.[115] The impacts of ozone formation on communities in and around the project area are significant, and the CRC should have evaluated the likely new 8-hour NAAQS.

By once again relying upon compliance with the NAAQS instead of addressing EPA's scientific findings (and those of the CASAC) about ozone, the CRC fails to offer a rational conclusion on ozone impacts. Essentially, the Technical Report states that: "The impact of this proposed standard on the CRC project is expected to be minimal as the project is already included in estimates of ozone precursor emissions as part of the Portland Ozone Maintenance Area plan."[116] What is concerning, however, is that the Portland Ozone Maintenance Area plan presents a plan for continued compliance with the old 8-hour ozone standard, and was last updated in February 2007. The Technical Report does not demonstrate compliance with the old ozone NAAQS through modeling, and even if it had, such a demonstration would shed no light on compliance with the new ozone standards. Where EPA has found that people "with asthma

[113] Available at: http://www.epa.gov/glo/pdfs/201107_OMBdraft-OzoneNAAQSpreamble.pdf, attached in Air Quality Citation Sources Folder.
[114] After EPA set the 8-hour NAAQS at 0.075 ppm. "CASAC took the unusual step of sending EPA a letter expressing strong, unanimous disagreement with EPA's decisions on both the primary and secondary standards (Henderson, 2008). The CASAC explained that it did not endorse the revised primary O3 standard as being sufficiently protective of public health because it failed to satisfy the explicit stipulation of the Act to provide an adequate margin of safety." 75 Fed. Reg. 2938, at * (Jan. 19, 2010); *see also* CASAC, Review of the Agency's Final Ozone Staff Paper (March 26, 2007) ("*Ozone Panel members were unanimous in recommending that the level of the current primary ozone standard should be lowered from 0.08 ppm to no greater than 0.070 ppm.*" (emphasis in original)).
[115] The draft final rule is posted on EPA's website: http://www.epa.gov/air/ozonepollution/pdfs/201107_OMBdraft-OzoneNAAQSpreamble.pdf
[116] Air Quality Technical Report at 2-3.

O-002-025

and other preexisting pulmonary diseases are at increased risk" from ozone exposure, Draft Final Ozone Decision at 45, something more is required.

CRC's Conformity analysis is insufficient to disclose and analyze the impacts of air pollution.

O-002-026

The Project team must complete two steps in order to properly demonstrate conformity analysis. The first step is a regional analysis; this is when the project must be included in a conforming regional transportation plan and transportation improvement plan. The second step in this analysis requires the project to analyze the most congested intersections and demonstrate that, if the project is constructed, carbon monoxide levels (including carbon monoxide contributed by the project) will not exceed standards. The six intersections are: (1) E 39th St. at Main St. in Vancouver, (2) Mill Plain Blvd. at C St. in Vancouver, (3) Mill Plain Blvd. at I-5 Interchange in Vancouver, (4) Lombard St. at Interstate Ave. in Portland, (5) Fremont at MLK Jr. Blvd in Portland, and (6) Lombard St. at MLK Jr. Blvd. in Portland. Similar to the DEIS, the FEIS does not cite any authority nor provide any reasoning as to how or why the project team selected these intersections as the most congested intersections.

The FEIS fails to make clear that the conformity analysis does not require emissions from the demolition and construction period to be analyzed. As a result, the asserted impacts are inaccurate and incomplete because the conformity analysis pretends to reflect real emissions and pollutants within the ambient air. This demonstrates that just by fulfilling minimum standards under a separate and different regulatory requirement still does not amount to NEPA impact analysis.

FEIS fails to properly quantify NO_2 concentrations.

O-002-027

Despite EPA establishing requirements for an NO_2 monitoring network, the CRC project team fails to fully complete this mandated task. The FEIS misleadingly asserts that current

O-002-026

The conformity analysis is discussed and approach explained in the FEIS (Section 3.10) with further detail in the CRC Air Quality Technical Report. See also response to comment O-002-023, above.

O-002-027

The CRC project is not charged with conducting monitoring to establish the compliance status of roadways within the area. The FEIS does present data to indicate the likely compliance status, and also indicates that future NOx emissions will decrease, thus lowering future roadway impacts. As noted within the FEIS, the difference between the build and no-build emissions is very small and the impacts of the CRC project alone on local roadway emissions is likely to be small, within the range of measurement uncertainty. In addition, please see the response to comment O-002-023 above.

O-002-027

monitoring suggests the roadway NO_2 concentrations are below the proposed standard. However, none of the monitoring followed the regulatory requirement that it be conducted within 50 meters of a roadway. The CRC Project team admits in the FEIS that "additional monitoring will be needed to evaluate the *full* extent of roadway NO_2 impacts."[117] This admission is worthless for two reasons. First, the CRC Project team must include this information in the FEIS so that the public is fully aware of the CRC project's impacts. Second, the CRC Project team fails to provide any details, and even neglects to commit to additional monitoring to be in compliance with the new regulations. Thus, the CRC project team's NO_2 impact analysis is not only insufficient and incomplete, but is also not in compliance with Clean Air Act requirements.

O-002-028

The FEIS fails to adequately disclose or analyze impacts from Mobile Source Air Toxics (MSATs).

The FEIS makes the outrageous claim that:

> The Clean Air Act identifies 188 air toxics, of which MSATs are the subset emitted by mobile sources. Although MSATs pose potential public health concerns, there are no established regulatory limits for relevant MSAT pollutants.

FEIS at 3-273. On the contrary, the Oregon Environmental Quality Commission (EQC), the rulemaking body of the Department of Environmental Quality (DEQ), has established by rule Ambient Benchmark Concentrations (ABCs) for all six of the MSATs identified by EPA to be the most dangerous: benzene, 1,3-butadiene, formaldehyde, acrolein, acetaldehyde, and diesel particulate matter (DPM). The ABCs for these pollutants are:

Pollutant	Oregon ABC (ug m-3)
Benzene	0.13

[117] Air Quality Technical report for the FEIS at 2-3. (emphasis added).

O-002-028

The benchmarks are not regulatory limits. Please see the response to comment O-002-023 above.

O-002-028

1,3-butadiene	0.03
Formaldehyde	3
Acrolein	0.02
Acetaldehyde	0.45
Diesel particulate matter (DPM)	0.1
Naphthalene	0.03
Polycyclic aromatic hydrocarbons	0.0009

The CRC project team relied on Portland Air Toxics Solution (PATS), which is a Portland geographical region program attempting to reduce Oregon's air toxic pollutant concentrations. The FEIS states:

> As part of the Portland Air Toxics Solution (PATS) program, the DEQ (DEQ 2006) performed computer modeling to estimate and assess risks from 19 air toxics in the Portland-Vancouver metropolitan area, including the priority MSATs that the CRC project has evaluated. Although the PATS model is not intended for project-level analysis and is not connected to the CRC project, the PATS regional analysis provides perspective on the CRC results. The PATS study indicated that diesel exhaust, motor vehicles, and burning are important sources of air toxics in Portland. Regional modeling of on-road sources shows elevated benzene levels along freeways, with the highest concentrations in downtown Portland and in the Beaverton/Hillsboro area. Modeled formaldehyde levels show a similar pattern to benzene, except that the peak concentration for combined mobile sources is at PDX. The DEQ model indicated that diesel particulate matter (PM) concentrations from mobile sources peak in downtown Portland and are in the lower concentration range through most of the CRC's main project area.

FEIS at 3-277.

The FEIS' description of the PATS process is very misleading to those suffering from mobile source air toxic exposure in the project area. The FEIS tries to minimize the toxic air pollutant loading in the project area by claiming that air toxics are "in the lower concentration

O-002-028

range through most of the CRC's main project area." This easily leads to a conclusion that neither a current, nor future impacts from MSATs can be expected in the project area, a conclusion that is patently false. According to the PATS 2017 Modeling Summary for the 15 pollutants that will be over health-based benchmarks in 2017, the project area will be 5 – 10 times over the benchmark concentration for 1, 3 butadiene.[118] While this is lower than the projected concentration in downtown Portland, which will be over 10 times the benchmark concentration, it is hardly a "lower concentration range." For Benzene, even more of the project area is at 10 times or more over the benchmark concentration. These pollutants are probable human carcinogens, with a possible associations with heart disease. A reduction of 85% is required in all areas over the benchmark concentration, including those in the project area, to bring 1,3 butadiene and benzene concentrations down to safe levels.

For Diesel Particulate and PAH, the situation is even more dire, with the most densely populated portion of the I-5 corridor through North Portland exhibiting greater than 10 times the benchmark concentration or more. Diesel Particulate is associated with increased lung cancer, breathing and heart problems. PAH is a collection of chemicals containing one known carcinogen, and seven probable (Class B2) human carcinogens. Since Diesel Particulate and PAH come mainly from on and off road gas and diesel engines, including cars and trucks, construction equipment, ships, and rail sources, increases due to construction and construction-related traffic delays will impact residents in the project area regardless of the reductions that CRC assumes will occur by 2030 due to decreased trips across the river and better technology.[119]

[118] *See* PATS 2017 Modeling Summary in Air Quality Citation Sources Folder. Modeled concentrations in 2017 for each of the MSATs are included in this document.
[119] The concentration maps presented in the Air Quality Technical Report for these toxics are misleading because they present only the modeled concentrations from on-road and off-road mobile sources. This presentation ignores that the area affected by the CRC's on-road and off-

O-002-028

In short, the FEIS claims that the PATS regional analysis provides perspective on the CRC result, but the CRC analysis neglects to communicate any of the information developed in the PATS regional analysis, and provides misleading information about risks. Since the Air Quality Technical Report was completed, the PATS modeling has been completed and a final PATS report is close to release. Much more information about the air toxics impacts in areas affected by the CRC are available, and should be included in the FEIS or an SEIS.

The FEIS' reliance on the Harriet Tubman Middle School Monitoring Initiative to conclude that the project will not have impacts on sensitive populations is misplaced.

O-002-029

The CRC project team's reliance on results from an unrelated study to demonstrate CRC's air impact on sensitive populations is misplaced for several reasons. First, the study only monitored one school in the Portland area. Relying on the results from a single school neglects the impacts of the entire project area, including all of Vancouver. The FEIS fails to explain how results from Harriet Tubman Middle School comprise an accurate representative geographic sample.

Second, the Harriet Tubman study compared concentrations to "sample screening levels" (SSLs) that are significantly higher than the Oregon ABCs:

Pollutant	Oregon ABC (ug m-3)	EPA SSL (ug m-3)	Harriet Tubman Max Sample (ug m-3)
Benzene	0.13	30	2.247
1,3-butadiene	0.03	20	0.268
Formaldehyde	3	50	3.091

road mobile emissions will exceed the health-based benchmarks and the impacts of on-road and off-road mobile emissions will exacerbate those exceedances. By presenting only the mobile source emissions, the Air Quality Technical Report understates the baseline and the increase attributable to the CRC.

O-002-029

The results from EPA's study at Harriet Tubman are relevant. Please see the response above to comment O-002-023.

O-002-029

The Harriet Tubman samples exceeded all three benchmark concentrations, but were below the SSLs. Third, the Harriet Tubman study sampled air on 10 different days within a single 60-day period. Additionally, the Harriet Tubman analysis did not sample diesel particulate matter. Thus, the FEIS' reliance on the Harriet Tubman study fails to adequately describe how the CRC project will impact sensitive populations. In fact, the Harriet Tubman study actually demonstrates that concentrations, at least on some days, are higher than the Oregon ABCs.

The FEIS fails to adequately disclose and describe the temporary air quality effects of construction and congestion related construction.

O-002-030

While the FEIS acknowledges that all of the CRC build alternatives would cause short-term increases in air pollutant emissions, it fails to inventory which air pollutant emissions will increase or how much. The discussion does not include information about the specific pollutants that will increase and their associated health and environmental effects. Moreover, the FEIS continually attempts to minimize impacts without any basis in existing evidence.

The FEIS depends on inadequate mitigation measures to minimize the impacts of construction and construction related congestion emissions.

The FEIS depends upon mitigation measures to understate the impact of temporary emission increases from construction and construction related congestion. The FEIS fails to describe the mitigation efforts, however, simply depending upon future development of plans for mitigation. *See* FEIS at 3-283. The FEIS states: "For a project of this magnitude, the contractor will be required to develop a pollution control plan that includes documentation of operational measures that will be used to reduce emissions. Section 290 of the ODOT standard specifications describes requirements for environmental protection, including air pollution control measures." After locating and reading the ODOT specification section 290, it is clear that only one mitigation measure is required, a limit on idling diesel equipment, but the limit has so many

O-002-030

The research from the construction of the Dan Ryan Expressway is relevant to CRC. Please see the response above to comment O-002-023.

O-002-030

exceptions as to be made meaningless. Section 290.30(c)(1) of ODOT standard specifications states:

> **(1) Vehicle and Equipment Idling** - Establish truck staging areas for diesel-powered vehicles located where truck emissions have a minimum impact on sensitive populations, such as residences, schools, hospitals and nursing homes. Limit idling of trucks and other diesel powered equipment to five minutes, when the equipment is not in use or in motion, except as follows:
>
> • When traffic conditions or mechanical difficulties, over which the operator has no control, force the equipment to remain motionless.
>
> • When operating the equipment's heating, cooling or auxiliary systems is necessary to accomplish the equipment's intended use.
>
> • To bring the equipment to the manufacturer's recommended operating temperature.
>
> • When the outdoor temperature is below 20 °F.
>
> • When needed to repair equipment.
>
> • Under other circumstances specifically authorized by the Engineer.

This is the only measure included in the specification to mitigate air pollution increases from construction and construction related congestion. To ensure that real mitigation of temporary air pollution increases occurs, the FEIS must specify actual mitigation measures. Where will the diesel staging area be located to avoid impacting residences, schools, hospitals and nursing homes? How will exposures to pollutants from diesel combustion be minimized?

The FEIS erroneously relies on an inapposite study of an unrelated and dissimilar construction project to support its assertion that no impacts from construction will occur.

The FEIS depends upon a study of the Dan Ryan Expressway Reconstruction in Chicago, Illinois. While the Dan Ryan Expressway is the busiest expressway in Chicago, serving double the number of vehicles of the I-5 corridor, it still does not provide an accurate insight for the construction impacts of the CRC project.

O-002-030

First, the Dan Ryan Expressway is located in a non-attainment area for the annual particulate matter 2.5; the CRC is located in a maintenance area for carbon monoxide. Second, the city of Chicago is relatively consistent with natural flatness in the region, while the city of Portland is within the Willamette Valley, cradled by Mount Hood, Mount Adams and Mount Tabor. Generally, air pollution travels more easily in a flat geographic region compared to a valleyed geographic region. Third, Chicago is windy and located next to Lake Michigan while Portland is not windy and is inland. Finally, the Dan Ryan Expressway project monitored for only one relevant MSAT, PAH. PAH in Portland has been associated with residential wood combustion, as well as mobile on-road and off-road sources. A more reasonable measure of toxics impacts would include at least Diesel Particulate. Moreover, the CRC claims that no standards exists for MSATs, which, as discussed above, is false. Therefore CRC does not provide any comparison of the PAH emissions increases due to construction of the Dan Ryan Expressway to the Oregon Ambient Benchmark Concentrations.

As a result, the FEIS claim that "the results from the Dan Ryan Expressway project [indicate] that the CRC's construction activities should not result in any violations of the air quality standards and should not pose an **undue** health risk to the neighboring communities" is unfounded. The FEIS fails to provide an adequate analysis for the air quality impacts, and no analysis whatsoever for increases in cancer causing air toxic pollutants, resulting from on-site construction. Since the FEIS does not disclose what the impact of construction will be, the CRC's conclusion that no undue health or environmental risks will be present is a baseless conclusion. As described above, much of the project area exceeds or will exceed Oregon's Ambient Benchmark Concentrations for several MSATs when construction is occurring. Thus, any increase in these pollutants will have health impacts for some part of the project area

O-002-030

population, most likely the most vulnerable, children and the elderly. The FEIS' misleading and minimizing statements will provide cold comfort to those families who will be unduly impacted by air pollution from construction.

The FEIS fails to properly analyze the impacts of off-site staging and casting.

O-002-031

Although the FEIS acknowledges that the project's staging and casting construction activities may have associated pollutant-emitting sources, it avoids conducting a thorough analysis by relying on Air Contaminant Discharge Permits. This piece-meal strategy serves as an escape from fully disclosing the project's complete impact. As explained to earlier, this is further demonstrated by fact that the CRC project team did not consider construction related activities in the carbon monoxide hot spot analysis.[120] Thus, by not disclosing the project's full impacts, the FEIS is incomplete.

Furthermore, while this is an FEIS, the off-site construction plans have yet to be finalized. This is because the FEIS fails to identify the number of off-site locations the project needs, fails to explain the final purpose of the locations, and fails to provide actual off-site locations. Instead the FEIS states that the project "would require *at least one* large site to stage equipment and materials, and *could also require* a large site for use as casting yard for fabricating segments of the new bridges."[121] This information serves as a progress report, not a final statement. Additionally, the project team has not selected a specific site but rather provides a list of candidate sites. The potential sites include the Port of Vancouver Parcel 1A, Red Lion at the Quay, Thunderbird Hotel site on Hayden Island, Port of Vancouver Alcoa/Evergreen West, and Sundial. With only a list of candidates, the analysis is incomplete since different locations would impact different areas. This is further supported by the technical report's language

[120] 40 CFR 93.123(c)(5).
[121] FEIS 3-282 (emphasis added).

O-002-031

The project does not currently anticipate continual construction activity lasting longer than five years at any one site. Details about construction staging will depend largely on the construction plans that will be determined following the retention of a design-build contractor. Only then would any such impacts be quantifiable. Should it become evident that construction will occur continually at a given site for more than five years, then the project would conduct appropriate hotspot analysis at that time. Please see response to EPA comment F-001-003 on this topic as well.

O-002-031

distinguishing two sites from the other sites.[122] Thus, the temporary effects analysis is also incomplete and further fails to meet the NEPA requirements.

Under the transportation conformity rules (40 CFR 93.123(c)(5)), CRC must conduct carbon monoxide and particulate matter hot spot analyses for any construction activity lasting more than five years. CRC did not conduct a hot spot analysis for the potential staging areas, the Hayden Island interchange site or the local access bridge site, yet the FEIS fails to analyze the likelihood of concentrated construction activity lasting longer than five years. The health of local residents will be disproportionately adversely impacted should concentrated construction activity at the Thunderbird Hotel staging area, the Hayden Island interchange or local access bridge last longer than five years.

The FEIS fails to properly analyze Greenhouse Gas (GHG) impacts.

O-002-032

The FEIS claims that the LPA will result in a net decrease in GHG emissions compared to the No-Build Alternative.[123] The FEIS condems humanity to catastrophic climate change, concluding that "total emissions are expected to continue to increase for the foreseeable future." FEIS at 3-440. Certainly, there can no longer be any doubt that our climate is changing due to human sources of greenhouse gases. The composition of the atmosphere has been shifted to the extent that CO_2 levels are higher than they have been in the past 800,000 years.[124] James Hansen, a NASA climate scientist, tells us that to avoid catastrophic melting of ice sheets, CO_2

[122] Air Quality Technical Report 6-2. ("The proposed Port of Vancouver sites and the Sundial site are sufficiently far away from the project area that they would not have a direct effect on the project area.")

[123] The careful reader understands that the FEIS is only claiming a reduction in comparison to the no action alternative. See FEIS at 3-433. But the not so careful reader will believe that the FEIS is actually claiming an overall net reduction in GHG emissions. See FEIS at 3-444 ("the LPA is expected to reduce regional emissions"). This lack of clarity can be quite misleading.

[124] "Provocative New Study Warns of Crossing Planetary Boundaries," Carl Zimmer: Yale Environment 360, http://www.e360.yale.edu/content/feature.msp?id=2192 in Air Quality Citation Sources Folder.

O-002-032

See Section 3.19.10 of the FEIS, and the responses to GHG and climate change issues on pages 6-19 through 6-20. The EIS acknowledges that global GHG emissions are expected to continue to increase for the foreseeable future and that the cumulative impact is effecting climate change. The relationship between traffic speeds and fuel efficiency is integral to the EIS analysis of GHG emissions. The FEIS provides data showing that without the project there would be substantially longer daily durations of congestion on I-5, including much more stop and go traffic and traffic moving at less than 20 mph (pages 3-32 to 3-34). See response above regarding design speeds relative to GHG emissions. The GHG emissions estimates in the FEIS are based on modeling that includes changes in traffic speed projections throughout the day.

The CRC Energy Technical Report explains various assumptions of the energy and GHG emissions analytical methodology, including "weighted fleet mix" and "traffic stream composition". See the discussion beginning on page 2-16 of this report. Assumptions made for the model were based on best available information.

O-002-032

levels must be no higher than 350 parts per million. Today, the atmosphere contains up to 389 parts per million. If, as the FEIS claims, emissions continue to increase for the foreseeable future, any hope we have to preserve the livability of our climate is lost.

Contrary to the CRC project team, the President of the United States, the Oregon Governor, and the Oregon Legislature have recognized that global warming poses a serious threat to the economic well-being, public health, natural resources and environment of Oregon, the nation and our world, and are focused on developing policy solutions to the looming climate crisis. In January 2009, President Obama stood before the nation and called for a "new era of responsibility," promising that his government would "restore science to its rightful place" and "roll back the specter of a warming planet."[125] The President spoke of a clean energy future where "[w]e will harness the sun and the winds and the soil to fuel our cars and run our factories," built upon a strong and interlocking foundation of innovation and sustainability.[126] The U.S. Environmental Protection Agency has stated that the dangers presented by climate change are "not a close case" and "[i]n both magnitude and probability, climate change is an enormous problem."[127]

About five years ago, the Oregon Governor's Advisory Group on Global Warming issued a report calling for immediate and significant action to address global warming and to reduce Oregon's exposure to the risks of global warming.[128] The Oregon Legislature has adopted

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[125] *See* http://www.whitehouse.gov/blog/inaugural-address/ In Air Quality Citation Source Folder
[126] *See id.*
[127] *U.S. Environmental Protection Agency, Climate Change Division, Office of Atmospheric Programs, Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act,* at ES-1, 3-4 (April 17, 2009), available at http://epa.gov/climatechange/endangerment/downloads/TSD_Endangerment.pdf in Air Quality Citation Source Folder.
[128] Governor's Advisory Group on Global Warming, *Oregon Strategy for Greenhouse Gas Reductions* at i (2004) (available at

O-002-032

aggressive greenhouse gas reduction goals, declaring it to be the policy of the state to reduce greenhouse gas emissions in Oregon as follows:

> (a) By 2010, arrest the growth of Oregon's greenhouse gas emissions and begin to reduce greenhouse gas emissions.
> (b) By 2020, achieve greenhouse gas levels that are 10 percent below 1990 levels.
> (c) By 2050, achieve greenhouse gas levels that are at least 75 percent below 1990 levels.

House Bill 3543 (2007).

In order for Oregon, the nation and our world to "roll back the spector of a warming planet," global climate change must be a top priority for all transportation projects, as the transportation sector accounts for 38% of the total GHG emissions in Oregon. Oregon's aggressive greenhouse gas reduction targets are impossible to achieve without critical evaluation of massive transportation projects like the CRC. By taking forward thinking action, not fatalistically maintaining the status quo, the CRC can help prevent the transformation of Oregon from one of the most beautiful places on earth to what the Governor's Advisory Group on Global Warming described in 2004 as "**dramatically altered and far less habitable** within only a few generations."[129]

Climate Change is not just a problem for our children and grandchildren, however. Global climate changes are already occurring. In the Pacific Northwest storms are more frequent and intense, and heat waves, droughts and floods are more severe and frequent. In addition, Pacific Northwest temperatures have been rising since 1920, precipitation has increased 10% since 1916 with some areas showing as high as a 40% rise, the sea level is rising 1-2mm per year, glaciers

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http://www.oregon.gov/ENERGY/GBLWRM/docs/GWReport-FInal.pdf) in Air Quality Citation Source Folder.

[129] Governor's Advisory Group on Global Warming, *Oregon Strategy for Greenhouse Gas Reductions* at i (2004) (available at http://www.oregon.gov/ENERGY/GBLWRM/docs/GWReport-FInal.pdf) In Air Quality Citation Source Folder.

O-002-032

are rapidly retreating, and Cascade snowpack is melting earlier and faster each spring.[130] These changes in the water cycle, along with other global climate changes, threaten crops, salmon, recreation, fishing, and water supplies. Global climate change also affects the reproductive success, range, and diet of vulnerable species.[131] A recent study revealed that climate change may be responsible for widespread decline in Western forests.[132]

Prominent international organizations have released reports documenting the harm being caused by the accelerating climate crisis. The magnitude of human suffering that global warming is causing, and will cause, has repeatedly been underlined and amplified. A series of reports, including a magisterial call for action from the Lancet, one of the world's leading medical journals, lend even greater urgency to addressing health and welfare impacts ranging from flooded coasts to sweltering heatwaves to spreading diseases.[133] The Lancet Commission's study, conducted by top academics working jointly with University College London, made world headlines when it was released in May 2009 and concluded simply that "[c]limate change is the biggest global health threat of the 21st century."[134] Bigger, in other words, than cancer, AIDS, multi-drug-resistant tuberculosis, starvation, malaria, or pandemic flu. As the report puts it, "[e]ffects of climate change on health will affect most populations in the next decades and put

[130] *Scientific Consensus Statement on the Likely Impacts of Climate Change on the Pacific Northwest*, Consensus Statement drafted by a subcommittee of participants in the scientific meeting "Impacts of Climate Change on the Pacific Northwest" convened at OSU on June 15, 2004 at 4 (available at www.cf.org/westcoastclimate/E_OSU%20Consensus%20Statement.pdf).
[131] *See* IPCC, *Climate Change 2001: Impacts, Adaptation and Vulnerability* (2001), available at http:www.grida.no/climate/ipcc_tar/wg2/index.htm; IPCC, *Climate Change 2007: The Synthesis Report* (2007), available at http:www.ipcc.ch; NRC, *Climate Change Science: An Analysis of Some Key Questions*, (2001) (available at http://books.nap.edu/html/climatechange/) In Air Quality Citation Source Folder.
[132] Phillip J. vanMantgnm, *et al.*, "Widespread Increase of Tree Mortality Rates in the Western United States," *Science* Vol. 323 (Jan. 23, 2009) (available at http://www.sciencemag.org).
[133] *Anthony Costello et al., The Lancet Commissions, Managing the health effects of climate change, 373 The Lancet 1693, 1693 (May 16, 2009)* In Air Quality Citation Source Folder.
[134] *Id.*

O-002-032

the lives and wellbeing of billions of people at increased risk."[135]

Moreover, major climate-linked disasters are on the rise. "In recent years, more than 2 billion people were affected by natural disasters, many of which were directly or indirectly related to extreme meteorological phenomena, including heatwaves and coldwaves, floods, droughts, and windstorms."[136] Reinsurance giant Munich Re tracks such disasters and reports that in 2007 there were 960 major natural disasters – the highest number ever – and "more than 90% [were] the result of extreme weather-related or climate-related events."[137] The 2007 events were accompanied by 16,000 reported fatalities and $82 billion in economic losses.[138] Munich Re reports that "the number of great weather-related disasters has climbed from an average of less than two per year in 1950 to more than six annually by 2007. Over the same period, average annual economic losses have risen from less than $5 billion to more than $60 billion."[139]

Increasing CO_2 also causes acidification of the oceans. Acidic seawater interferes with the survival and growth of coral reefs and invertebrates because the acid dissolves the minerals these organisms need to build skeletons.[140] "According to recent surveys, the ocean is now acidifying 100 times faster than at any time during the past 20 million years."[141]

The FEIS' claim that the LPA will reduce GHGs is based on three primary factors:

1. tolling will decrease the number of cars crossing the River;
2. the LPA provides light rail that will divert some cars; and

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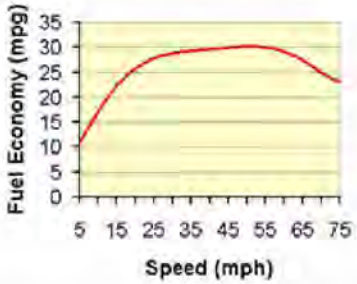
[135] *Id.*
[136] *Id.* at 1706.
[137] *Id.*; *see also* Ernst Rauch, Munich Re, *Effects of Climate Change on the Insurance Industry*, 26A Stanford Environmental Law Journal 239 (2007) in Air Quality Citation Source Folder
[138] Lancet Report at 1706.
[139] *Id.*
[140] "Provocative New Study Warns of Crossing Planetary Boundaries," Carl Zimmer: Yale Environment 360, http://www.e360.yale.edu/content/feature.msp?id=2192 in Air Quality Citation Source Folder.
[141] *Id.*

O-002-032

3. the LPA will reduce congestion, which will increase average speeds, which will reduce GHG emissions.

Obviously, the first two factors depend upon the validity of the CRC's traffic projections, as discussed above. The third factor, however, is patently false. The LPA is being built to accommodate 70 MPH traffic. As shown in the graph below, fuel economy is typically highest when traveling at speeds between 35 MPH and 50 MPH. The fuel efficiency of vehicles drops



precipitously after reaching 60 MPH.[142] Thus, the CRC cannot base its claim to reduced GHG emissions on the design speed of the project which is 70 MPH.

Moreover, the analysis of energy impacts contained in the Energy Technical Report is flawed for several reasons. First, the analysis used a national weighted fleet mix, rather than the regional or local weighted fleet mix. No data was provided to demonstrate that the expected fleet traveling across the River was similar to the national weighted fleet mix. Second, the analysis used weekdays in July as representative "typical" operating conditions. In the Pacific Northwest Climate, however, the use of July weekdays to represent "typical" operating conditions is inappropriate. Summer in the Pacific Northwest features excellent visibility and

[142] fueleconomy.gov

O-002-032 decreased traffic volumes due to school closures. Rainy, gray weather, on the other hand, which lasts for approximately eight months of the year in the Portland Metro area, is much more representative of "typical" operating conditions.

Using inappropriate assumptions about typical traffic patterns and a design speed at a non-efficient MPH results in an analysis that falsely claims that the LPA will decrease GHG in comparison with the no-build alternative. Of course, the GHG analysis suffers the same flaws as all of the analyses that are based on the CRC's erroneous traffic projections for 2030.

HUMAN HEALTH IMPACTS[143]

The FEIS Fails To Provide Adequate Analysis On The Impact Of CRC On Human Health:

O-002-033 The CRC has the potential to significantly affect public health in the I-5 corridor as well as in the surrounding neighborhoods and the I-205 corridor, but the FEIS does not provide adequate analysis that addresses public health concerns of the CRC. A project of the scale of CRC can have a huge impact on the ability of people to live healthy lives both during and after construction. Noise, air quality, mental health, physical activity, safety, access to fresh food, access to meet daily needs, social capital, housing quality, availability of affordable housing, and water quality[144] are all affected by transportation and have direct or indirect effects on public health. Adverse effects of living close to a major highway include a rise in asthma[145], diabetes,

[143] Cited articles are located in the Health Impacts Folder.
[144] Design for Health. Health Impact Assessment Preliminary Checklist Background and Instructions. Version 2.0. 2007. www.designforhealth.net
[145] Kim JJ, Smorodinsky S, Lipsett M, Singer BC, Hanigan AT, Ostro B. Traffic related air pollution and respiratory health: East Bay Children's Respiratory health Study. American Journal of Respiratory and Critical Care Medicine 170: 520-526 2004.

O-002-033

While EISs rarely include a chapter titled "human health", impacts to human health have been integral to NEPA analysis for the past 40 years, and they are integrated throughout the CRC NEPA analysis as well. The DEIS and FEIS analyses of impacts to air quality, noise, electromagnetic fields, water quality, groundwater, hazardous materials, and other factors are based on comparing the project's impacts to standards that have been established to protect public health. In addition, the analysis of impacts to land use, neighborhoods, biking, walking, traffic, safety, security, parks and recreation, public services, and visual resources also relate to public health. See the response to DEIS comments related to human health on page 6-30 of the FEIS, as well the Chapter 3 analyses of impacts to the human health-related issues listed above.

O-002-033

obesity due to decreased physical activity[146], cardiovascular disease, hypertension, injury, and mortality[147].

The current FEIS approaches human health impact as a minor side-effect of the CRC and only a cursory glance has been given to the health impacts, including on Environmental Justice populations. The FEIS fails to provide adequate information on the impact to human health in the Environmental Justice Technical Report, Indirect Effects Technical Report, Noise & Vibration Technical Report & Hazardous Materials Technical Report, or Air Quality Technical Report. Information provided on the positive or negative health impacts of the CRC is frequently unsupported by evidentiary data.

The FEIS fails to approach the issue of public health impact in a structured manner[148]. First, a baseline health status of communities affected directly and indirectly by the project must be established. Second, an analysis of the direct, indirect and cumulative public health consequences of the proposed project must be carried out. Third, potential mitigation measures must be identified, should any significant health impact be identified. Finally, the ways in which the health effects identified might disproportionately affect low income or minority populations, or children, must be discussed.

Legal Basis for Including Public Health Analysis in the EIS:

NEPA requires health impacts, including health impact related to economic and social effects, to be addressed in the EIS. The inclusion of a systematic approach to public health impact of the CRC is supported by NEPA, the regulations issued by the Council on Environmental Quality (CEQ), the agency in the Executive Office of the President charged with

146 Cohen DA, et. al.. Public parks and physical activity among adolescent girls. Pediatrics 118:1381-1389 2006.

147 Design for Health. Health Impact Assessment Preliminary Checklist Background and Instructions. Version 2.0., 2007. www.designforhealth.net

148 Wernham, Bear. Public Health Analysis Under The National Environmental Policy Act, 2010.

O-002-033

overseeing implementation of NEPA (Executive Orders 12898 and 13045), and available guidance on NEPA and environmental justice. NEPA requires that the FEIS include an analysis of the proposed project's human health impact and prohibits the agency from delegating the analysis to a separate agency external to the NEPA process.

NEPA expressly recognizes the interdependence of environmental quality and human health. NEPA states that the Congressional intent embodied in the statute is to "assure for all Americans safe, ***healthful***, productive, and aesthetically and culturally pleasing surroundings." 42 U.S.C. § 4331 (emphasis added). Among NEPA's fundamental purposes is to "promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate ***the health and welfare of man***." 42 U.S.C.§ 4321 (emphasis added). NEPA is intended to, "attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences." 42 U.S.C.§ 4331. NEPA is intended to apply to all federal actions "affecting the quality of the human environment." 42 U.S.C.§ 4332(c).

The NEPA regulations promulgated by the Council for Environmental Quality ("CEQ") also support the inclusion of a health impact analysis. In determining whether an effect may be significant, the lead agency must consider "[t]he degree to which the effects on the human environment are likely to be highly controversial." 40 CFR § 1508.27(b)(4). The CEQ regulations specifically define health as one of the effects that must be considered in an EIS. In defining "effects," the regulations state, "[e]ffects includes ecological, aesthetic, historic, cultural, economic, social, or ***health***, whether direct, indirect or cumulative." 40 CFR § 1508.8. The regulations instruct agencies to consider "the degree to which the proposed action affects ***public health or safety***" in determining significance. 40 CFR § 1508.27.

O-002-033

The United States EPA and CEQ have guidance documents on the requirement to analyze health impacts. These documents rely on the statutory provisions of NEPA and upon two Presidential Executive Orders. Executive Order 12898 instructs agencies to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse ***human health*** or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States. Executive Order 13045 states that agencies must, "make it a high priority to identify and assess ***environmental health risks and safety risks*** that may disproportionately affect children; and … shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks."

Health in DEIS & FEIS:

While the DEIS and FEIS reference health in several sections, they fail to adequately address the human health impact in the following ways:

Noise & Vibration: The Noise & Vibration Technical Report of the FEIS discusses in depth, the temporary and long-term effects of noise and vibration arising from the project and proposes several mitigation methods. However, there is no discussion on how noise and vibration, including cumulative levels, would affect, temporarily or permanently, the health of people in the surrounding communities, especially children and the elderly. A number of studies have shown that longterm exposure to moderate noise can increase stress, hypertension, blood pressure, heart disease, and sleep disturbances.[149]

Air Quality: The Air Quality Technical Report of the FEIS does not adequately address health risks associated with the project, citing insufficient/inconclusive data, which is unacceptable. Health of communities surrounding the affected area should be a pressing concern. The FEIS

149 Van Kempen EEMM, Kruize H, Boshuizen HC, Amelin CB, Staatsen BAM, de HollanderAEM. (2002). The association between noise exposure and blood pressure and ischemic heart disease: A meta-analysis. Environmental Health Perspectives: 110: 307-317.

O-002-033

needs to assess actual risk to human health through respiratory illness, asthma, cancer and other relevant health risks.

Obesity: The CLF-PEAC comments to the DEIS presented obesity as a cause for concern in the project. However, both the DEIS and the FEIS failed to address the overall impact of the project on obesity. While the FEIS addresses needs for bicycle and pedestrian-oriented design in the project, it needs to carry out an analysis of the impacts of such measures on whether the project provides greater opportunities to walk, bike or use public transit and the overall walkability of the surrounding neighborhoods. Walking, biking and public transit use have been shown to be associated with obesity, healthcare cost expenditures and overall lifespan.[150,151]

Construction Related Health Impacts: The FEIS states that with mitigation measures, there will be no adverse construction-related impacts on air quality or noise. The FEIS, again, fails to consider the impact of construction and related activities on people residing in neighboring communities – especially children and elderly who are more sensitive to health risks and other hazards that construction activities might pose. Also, the FEIS fails to provide a convincing argument that the air quality impact due to construction is fairly low. The Chicago highway example is cited as a comparable but no information is provided as to how the case study is relevant to this project.

Benefits of Including a Separate Public Health Analysis in the FEIS:

A complete analysis of health effects responsive to NEPA would consider all potentially significant direct, indirect and cumulative health impacts associated with the proposed action and alternatives and would include descriptions of baseline heath status and determinants of health for the affected population. The inclusion of a systematic approach to determining the public

150 Edwards, Ryan D. (2008) Public transit, obesity, and medical costs: Assessing the magnitudes. Preventive Medicine, 46 (1). pp. 14-21.

151 Frank L, Andresen M and Schmid T. "Obesity Relationships with Community Design, Physical Activity, and Time Spent in Cars." American Journal of Preventive Medicine, 27(2): 87–96, August 2004

O-002-033

health impact of the CRC would result in practical, evidence-driven recommendations that address identified health impacts.

A Health Impact Assessment (HIA) is a tool that could be used to address the potential public health impact of the CRC. An HIA[152] is a practical tool that can provide a structured process to determine a policy or project's impact on health; bring both immediate and long-term health benefits; and ensure that policy and project dollars are used efficiently to provide the greatest benefit.

Such an analysis would involve close collaboration between the decision makers on the project, public health experts, and affected communities. This analysis, which is currently lacking in the FEIS, can have several benefits[153]:

- By using sound, objective data gathered on health impacts, potentially unexpected health consequences and unanticipated costs can be identified and thus avoided.
- We can develop healthier communities by identifying design solutions that address the root causes of many prominent health problems like asthma, diabetes, and cardiovascular disease.
- It can build consensus by addressing the affected community's fears about the CRC transparently, by providing practical solutions and by engaging the community residents in the decision making process especially pertaining to health concerns.
- It can provide a clear, structured way to recognize the positive contributions of the CRC on the health of communities. It can also give the CRC committee an

152 Frequently Asked Questions. http://www.humanimpact.org/hia

153 Frequently Asked Questions about Integrating Health Impact Assessment into Environment Impact Statement. http://www.humanimpact.org/hia

O-002-033

opportunity to build productive and positive working relationships with the community and establish smart planning measures in the region.

- It will help ensure the CRC project meets its stated objectives.

Considerations for the CRC project must go beyond the freeway and infrastructure, and health must be an overriding consideration. Any change to the I-5 corridor should be viewed as an opportunity for repair and improvement of the current health situation. Understanding all of the health implications of the proposed project will help to advance better transportation policy. Conducting a Health Impact Assessment can ensure that the CRC is an improvement project for all stakeholders, especially impacted communities. Therefore, an HIA should be conducted to adequately address human health as a part of the FEIS, and the HIA findings should be used to provide evidence-based recommendations to help improve the health outcomes of the CRC project.

BICYCLE FACILITIES

O-002-034

The FEIS fails to explain how bicycle and pedestrian facilities are designed to meet the forecasted increases in alternative transportation. According to the FEIS, current demand of bicyclists and pedestrians on the I-5 bridge is 304 bikes and 64 pedestrians per day.[154] In the CRC's fact sheet regarding bicycle and pedestrian improvements, dated October 1st, 2011, by 2030 the number of bicyclists is expected to be 5000 and pedestrians 1000 per day.[155] Facing this 16-fold increase in alternative transportation use, the FEIS plans call for a path width of 16 to 20 feet, depending on the width of the overall structure.[156] The FEIS fails to explain why, despite significant anticipated growth, current plans call for a design width of just two feet wider than

[154] FEIS Traffic Technical Report, 5-28.
[155] CRC Bicycle and Pedestrian Improvements Fact Sheet, 3. Available at http://columbiarivercrossing.org/FileLibrary/FactSheets/CRC_Ped_Bike_Folio.pdf
[156] FEIS Chapter 2, 2-30.

O-002-034

The shared facility for pedestrians and bicyclists on the main span across the Columbia River is anticipated to be between 16 and 20 feet. At this stage of the design process, it is not possible to be more specific about the facility's width due to uncertainties about the details of the bridge structure and geometry.

The CRC undertook extensive analysis of existing and future use of the facility by bicyclists and pedestrians. This effort included developing a model that accounts for the mode split (auto, public transit, bicycle, walking) by travel distance. The Hawthorne Bridge, the highest use facility in Portland's bicycle/pedestrian extensive system, was the basis for this travel distance-mode split model. The CRC prepared pedestrian and bicycle forecasts for several scenarios. The pedestrian use forecasts for year 2030 varied from 600 to 1,000 daily walkers. The bicycle use forecasts for year 2030 varied from 900 to 6,400 users per day.

O-002-034

the minimum 14 feet standard for Oregon and Washington.[157] The lack of any discussion regarding the chosen width indicates an indifference to the quality of bicycle and pedestrian facilities. In fact the proposed path appears to use only about one half of the area under the "northbound bridge," and the FEIS does not explain what the other half of this area would be used for. If it cannot be used for bikes, is this hidden capacity for future vehicle traffic?

Further demonstrating the project's disinterest in alternative transportation, the FEIS contains glaring contradictions about the planned width of the bicycle path. As mentioned, Chapter 2 of the FEIS claims that the portion of the path over the river crossing "would be 16 to 20 feet wide, located within the superstructure above the bridge columns and below the bridge deck."[158] However, in the very same FEIS, the Traffic Technical Report claims the river crossing path "could be up to 24-feet wide, located within the superstructure above the bridge columns and below the bridge deck."[159] Also, the fact sheet on bicycle and pedestrian improvements claims "the path across the bridge will be 20 feet wide."[160] By providing confusing and contradictory claims about path width, the CRC literature fails to adequately inform the public about what it claims to be an important aspect of the project. The lack of attention to the design of the bicycle and pedestrian path confirms the claim that such facilities are merely lipstick on a mega-highway project pig.

As noted by the Portland Pedestrian Advisory Committee's June 18, 2010 letter (PAC Letter in Other Comments Folder), the CRC revisions to the LPA significantly curtailed bicycle and pedestrian facilities while at the same time maintaining essentially the same vehicle lane

[157] FEIS Traffic Technical Report, 5-28.
[158] FEIS Chapter 2, 2-30
[159] FEIS Traffic Technical Report, 2-32.
[160] CRC Bicycle and Pedestrian Improvements Fact Sheet, 3.

O-002-034

capacity.[161] Moreover those changes adopted a stacked design that moved the bicycle lanes to the enclosed underside of the bridge. Since 2008, the bridge pathway design has been stripped of most bicycle and pedestrian amenities. The design has gone:

–from two paths on either side of the bridge (at 12' and 26' wide) to just one
–from access at both sides of I-5 (which is very wide) in Vancouver to just on one
–from two elevators in the system to one
–from four or more viewpoints along the route to just one
–from 2 open-air, full-view paths to one that is deeply overhung and enclosed along half its length

Further, the quality of the bicycle and pedestrian facilities are always vastly overstated when the CRC presents them to the public:

–the path is touted as "twenty-four feet wide" when in fact it is only so at its flattest, straightest part – most of the route is just the DOT standard 16' wide
–travel distance on the planned path would actually be LONGER; it is more circuitous than today's route
–access to the path from Vancouver will require going up 5 blocks worth of corkscrews
–the under-bridge path is always depicted on a blazingly-sunny day at dawn, and never with a glimpse to the east, and the 200 feet of concrete overhang and multiple structural walls
–the under-bridge path is described as "world-class" despite the fact that no one else in the world has ever made the mistake of building one like it

These are changes that will have significant impacts on cyclists and pedestrians, yet they are not even discussed when the Federal agencies address whether changes to the LPA required a SDEIS. Apparently only changes that impact motor vehicles can be significant.

ENVIRONEMTNAL JUSTICE IMPACTS AND DIRECT IMPACTS TO COMMUNITIES

Rosemere Comments- Environmental Justice

[161] The FEIS rather conspicuously fails to disclose the actual width of the LPA bridges, see FEIS at 2-7 and 2-10, while at the same time disclosing this information for the other alternatives. This disparity in information is of course completely inconsistent with the CRC's insistence that it is providing greater detail and analysis regarding the LPA in the FEIS. The lack of information also creates the very real impression that the FEIS is hiding the true vehicle traffic lane capacity of the LPA bridges.

O-002-035

As the originator of Environmental Justice (EJ) Studies in Vancouver, Rosemere identified 17 west side neighborhoods that qualified (meeting EPA thresholds) as low-income/minority populations. At the Washington Elementary School in Rosemere, later renamed Rose Village, students in the subsidized lunch program rate in the upper 90th percentile, among the highest in the city. The history of EJ studies done by Rosemere is well documented. Further, the studies have resulted in Title VI complaints with EPA's Office of Civil Rights and a well publicized case in the 9th Circuit Court of Appeals where Rosemere prevailed, making national headlines.[162] To now see CRC staff disqualify EJ identification is disingenuous.

The FEIS concludes that the Shumway, Rose Village, and Esther Short neighborhoods are not identified as being "disproportionately below the poverty level."[163] EPA requested, in support of EJ studies, that CRC obtain data relative to elevated asthma cases in neighborhoods adjacent to the I-5 corridor in the construction zone. However, CRC simply responded that no such data was available and EPA has become complicit in allowing a lack of data to presume that no such EJ communities exist. Claiming that there is no time to gather information and research is also disingenuous given the years that have passed between the DEIS and FEIS. An article in the October 21, 2011 *Oregonian* illustrates that such information is readily available. *See EJ Oregonian*, Media Folder.

The use of the federal poverty line is inadequate to determine whether potentially impacted communities are low-income environmental justice communities pursuant to Executive Order

[162] **Rosemere Neighborhood Ass'n v. U.S. Envtl. Prot. Agency**, 581 F.3d 1169 (9th Cir. 2009); Jennifer Koons, Appeals Court Finds Widespread Failure by EPA to Investigate Civil Rights Complaints, N.Y. Times (Sept. 18, 2009), *available at* http://www.nytimes.com/gwire/2009/09/18/18greenwire-appeals-court-finds-widespread-failure-by-epa-78403.html.

[163] See FEIS Section 3.5.

O-002-035

The EJ analysis did not identify disproportionate high and adverse effects on either low income or minority populations. The CRC project study area is large and demographically diverse. The project has recognized that there are not only individual households in the study area that are minority or low-income, but that there are also areas that have comparatively high rates of EJ households. Refer to pages 3-135 through 3-137 of the FEIS where there is detailed information about which neighborhoods have the highest percentages of minority and low-income households. The project fully recognizes the presence of EJ households and the areas where the percentage of these households are comparatively high.

The project has not completed a survey of asthma rates in North Portland. The data on asthma and other human health conditions is only available at the state and county level. Such data will not help the project assess asthma rates near the interstate facility. Additionally, the air quality analysis demonstrates an improvement in air quality with the LPA over no-build and other DEIS alternatives, and compliance with all relevant air quality standards. The Oregonian article cited utilizes data related to percentage of free and subsidized lunches at schools within the study area. These data have been used to help characterize study area demographics since the DEIS.

Regarding the poverty line as a measure of low income status, USDOT guidance on EJ analyses require the use of the federal poverty guidelines as the threshold for defining low-income, and therefore, the maps and tables in Section 3.5 report these data. The project recognizes that an EJ analysis needs to look broadly at a community. The project has mapped community resources, coordinated with local housing authorities, and worked to accurately understand and characterize poverty in the study area.

O-002-035

12898 and the FTA's Draft Circular on Environmental Justice. CRC also has failed to comply with Executive Order 12898, requiring each federal agency to identify and address "disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

CRC initially convened a Community and Environmental Justice Group (CEJG) comprised of community residents and representatives from both Vancouver and Portland communities, including residents of diverse economic backgrounds and ethnicities. While agency obtained a veneer of diversity, the CEJG was not given a basic environmental justice training until two years into the process and precluded CEJG discussion of environmental justice concerns, including specific impacts, mitigation measures and community benefit agreements. CRC disbanded the CEJG prior to release of the DEIS.

Due to the significant disproportionate impacts on a low-income population, Executive Order 12898 and NEPA require CRC to conduct an alternatives analysis that avoids, reduces or mitigates such impact.

AQUATIC SPECIES/SALMON

THE BIOLOGICAL OPINION VIOLATES THE ENDANGERED SPECIES ACT.

The Endangered Species Act

O-002-036

Section 7 of the ESA requires that each federal agency ensure that its actions, and any action it authorizes, are not likely to "jeopardize the continued existence" of a listed species. 16 U.S.C. § 1536(a)(2). In fulfilling this mandate, each federal agency that undertakes, or is requested to approve, an action that may affect a listed species must consult with the appropriate federal wildlife agency – here NMFS. *Id.*; 50 C.F.R. § 402.14. Through this consultation process, NMFS must, using "the best scientific and commercial data available," 16 U.S.C. § 1536(a)(2),

The analysis and modeling of air quality documented in the DEIS indicates that future conditions with or without the project will receive a 30% to 90% reduction in emission of air toxics due to expected improvements in vehicle emissions technology and fleet changes. The project was shown to have a very small reduction in emissions.

The CEJG was chartered to address Community as well as Environmental Justice issues. Both sets of issues were addressed throughout the early years of the group's work. The group was trained in EJ issues, methods, and more at numerous times.

O-002-036

PEAC asserts that the National Marine Fisheries Service (NMFS) erred in its formal consultation of the CRC project under ESA. Because many of the comments relate to internal NMFS processes and procedures and NMFS regulatory compliance, FHWA and FTA cannot directly respond to those assertions. The following addresses PEAC's expressed concerns that relate to FTA and FHWA actions, including the NEPA analysis. While adherence to policies and regulations internal to NMFS is a NMFS responsibility, FTA and FHWA stand behind the Biological Assessment (BA) and agree with the Biological Opinion (BO) issued by NMFS. Several years of analysis, and pre-consultation and consultation with NMFS, resulted in project design and construction commitments that substantially minimize impacts to threatened and endangered species, as documented in the BO.

PEAC notes that critical habitat for eulachon was formally designated on October 20, 2011, about 10 months after the BO was issued for the CRC project and a month after the FEIS was issued. After coordinating with NMFS, FHWA and FTA sent correspondence to NMFS (on November 28, 2011) stating the intention to re-initiate consultation to address potential project effects on eulachon critical habitat. Re-initiation of ESA consultation on this critical habitat will occur after the final rule takes

O-002-036

provide its "biological opinion" on the impacts the action will have on listed species and whether as a result of those impacts the action is likely to jeopardize the species. *Id.* § 1536(b)(3); 50 C.F.R. § 402.14(g)(4).164 Thus, NMFS must (1) "review all relevant information," (2) "evaluate the current status of the listed species," and (3) "evaluate the effects of the action and cumulative effects on the listed species." 50 C.F.R. § 402.14(g).

The first step in this process is for NMFS is to define the "action area" which is "all areas to be affected directly or indirectly" by the action. *Id.* § 402.02. NMFS must then describe the "environmental baseline" as it exists within the action area, including the "past and present impacts of all Federal, State, or private actions and other human activities, the anticipated impacts of all proposed Federal projects in the action area . . ., and the impact of State or private actions which are contemporaneous with" the action. *Id.* The effects that must be considered include the "direct and indirect effects . . . together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline." *Id.* The Service must also evaluate the "cumulative effects," *id.* § 402.14(g)(3), which include the "effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area." *Id.* § 402.02.

Based on this information, NMFS must determine whether the action is likely to jeopardize the continued existence of the listed species. If so, the Service must provide a Reasonable and Prudent Alternative ("RPA") that will avoid that result. However, if the Service concludes the project is not likely to jeopardize the species, it must provide an Incidental Take

164 An agency action is deemed to "jeopardize the continued existence of a listed species" if it "reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." 50 C.F.R. § 402.02.

effect on December 19, 2011. In the meantime, the project team has reviewed the critical habitat listing and is investigating similarities between eulachon and salmon/steelhead critical habitat elements. At this time, it is believed that the CRC project may affect critical habitat for eulachon to the same extent as it affects salmon/steelhead critical habitat. That is, no adverse modification or destruction of critical habitat is anticipated. After the re-initiated consultation is complete for the designated critical habitat for eulachon, a re-evaluation will be prepared to determine if any supplemental NEPA evaluation is required.

PEAC asserts that the cumulative impact analysis for salmon in the FEIS is inadequate because it does not evaluate the impacts of non-federal future actions, and other deficiencies. Information related to the discussion of cumulative impacts and FHWA/FTA's responsibilities under NEPA and ESA are addressed adequately in the project documents. Section 3.19 of the FEIS discusses the combined effects of past, present and reasonably foreseeable future actions. The FEIS refers to, rather than repeating, detailed analysis in the BA and BO. The FEIS also looks at more than just federal actions when considering reasonably foreseeable future actions. In addition to the analysis NMFS provided for the BO, the FEIS considered the projected impacts of future climate change on fish and fish habitat, and the impacts of foreseeable, relevant major private and public actions, as well as general development and regulatory trends. The effects of such future actions are generally not quantifiable and therefore must be considered qualitatively. Where quantified information was available, it was considered. In addition to the FEIS, Sections 4 and 5 of the Ecosystems Technical Report provide over 140 pages of discussion on long-term and short-term effects on aquatic and terrestrial locations. In this discussion and the findings of effects, it is disclosed that there will be cumulative effects.

Regarding comments on the in-water work window, the standard lower Columbia River in-water work window is published by ODFW as

O-002-036

Statement ("ITS") that "specifies the impact of [the] incidental taking" that will occur as a result of the project. 16 U.S.C. § 1536(b)(3)(B)(4); 50 C.F.R. § 402.14(i).

Reinitiatation of Consultation

As a threshold matter, consultation must be immediately reinitiated so that NMFS may properly consider the impacts of the CRC on the newly designated critical habitat for the eulachon. 76 Fed. Reg. 65,324 (Oct. 20, 2011). NMFS' regulations implementing the ESA state that reinitation of consultation is required whenever "a new species is listed or critical habitat designated that may be affected by the identified action" 50 C.F.R. § 402.16(d). Failure to take this mandatory action is a clear violation of the ESA.

Indeed, this analysis is vital considering the significant impacts the CRC may have on eulachon's habitat. Specifically, when NMFS) listed the Southern Distinct Population Segment of eulachon as threatened under the ESA, dredging was recognized as a major impact to the species; habitat. *See Status Review Update for Eulachon in Washington, Oregon, and California*, Prepared by the Eulachon Biological Review Team (Jan. 20, 2010) ("Potential dredging impacts on eulachon consist of direct effects of entrainment of adults and eggs and potential for smother of eggs with sediment . . . Indirect effects may consist of alteration of freshwater spawning habitat and estuarine nursery habitat.") (citations omitted) in Biological Opinions Folder. According to NMFS, "[d]redging during eulachon spawning would be particularly detrimental, as eggs associated with benthic substrates are likely to be destroyed." *Id.* at 13019. Here, given the size of the pillars being driven and the related inwater work when placing these structures, the effects of the bridge construction are likely very similar to a dredging project. NMFS must carefully consider these impacts in its new Biological Opinion.

November 1 through February 28. The WDFW published work window for this area is August 1 through March 31. Most projects in the lower Columbia River reviewed by the Oregon office of NMFS use the November 1 through February 28 period as the work window. However, all three agencies may extend or contract those work windows based on project impacts. As an example, please see NMFS BO (#2004/01041) for Columbia Dredging that allows for maintenance dredging in deep water year-round between river mile 4.4 and 106.5, with only side-channel, shallow-water dredging restricted to the November 1 through February 28 period.

The CRC project has had extensive coordination with ODFW, WDFW, and NMFS (as an example, please note the agency coordination discussion in Appendix G of the CRC BA located at this link: http://columbiarivercrossing.com/FileLibrary/Biological_Assessment_Opinion/CRC_BA_24_AppG.pdf).Coordination with these agencies included discussion of multiple options for reducing effects, including the effects of timing of construction activities relative to fish run timing. By limiting all in-water work to just the November 1 through February 28 period, construction would extend from a 3- or 4-year period to over 7 years. Agency and CRC staff considered that this longer term of disturbance in the river would have caused more harm to natural resources than by conducting the activities in the manner and timing described in the FEIS. In particular, concentrating all work in the November 1 through February 28 standard in-water-work window would likely result in higher impacts to Columbia River chum and eulachon (if present) than under the currently proposed longer work window. The proposed work window decreases the intensity of hydroacoustic impacts on these ESUs while still remaining protective of other migrating fish by avoiding hydroacoustic impacts during the peak migration times of the fish that are considered highly imperiled. The proposed work window would allow no pile driving during those peak periods. While in-water work window options were discussed with the agencies, the BA does not evaluate a range of in-

NMFS' Biological Opinion Fails to Comply with the Endangered Species Act.

NMFS Has Improperly Constricted the Action Area and Inaccurately Described the Environmental Base Line.

O-002-036

To properly evaluate the effects of an action, NMFS must define the appropriate "action area" and establish the "environmental baseline" to which the project's impacts will be added. 50 C.F.R. § 402.02. NMFS limited the "action area" here to "(1) The area where underwater noise caused by pile driving will exceed background; (2) the lower Columbia River where dissolved and suspended pollutants caused by stormwater runoff from CRC is redistributed to the Pacific Ocean; and (3) the eastern Pacific Ocean where southern resident killer whales overlap with Chinook salmon from the Columbia basin." BiOp at 19.165 This constricted action area fails to satisfy the regulatory requirement that the action area include "all areas" that will be "directly or indirectly" affected by the project. Specifically, NMFS fails to include the significant upland areas that will be impacted by the CRC, and which in turn, will significantly affect the species at issue. NMFS must, given the nature, scope, size and location of this project, define the action area to include the true geographic reach of the project's impacts on the salmon. To accomplish this, the designation of the action areas must begin with an accurate description of the direct and indirect impacts resulting from the CRC. Only through a process of describing an action area that represents the full geographic scope of the impacts of the project on the species at issue will NMFS be able to accurately evaluate the impact this project will have on the species.

165 NMFS later describes the "action area" as "the lower Columbia River basin, that portion of the mainstem Columbia River and its tributaries downstream of Bonneville Dam to its Pacific Ocean terminus." NMFS does not explain why the "eastern Pacific Ocean" was dropped from this analysis.

water work windows, as alternative construction methods are not addressed in ESA consultations.

The DEIS Ecosystems Technical Report states that the project committed to "timing in-water work to occur outside of critical fish migration seasons" (page 1-10), but did not commit to working just in the November 1 through February 28 period. Through the agency coordination process the information on fish migration timing was refined; additional impact avoidance and minimization measures were developed and committed to; and the CRC project, with input from agencies, constructed a hydroacoustic impacts model to quantify potential effects on ESA-listed fish from impact pile driving. As shown in the FEIS, the Ecosystems Technical Report, and other reports and processes such as the BA/BO, it has been documented that impacts to fish have been avoided or are substantially minimized, allowing for work windows that are longer than the standard.

O-002-036

Furthermore, by unlawfully constricting the "action area," NMFS excluded many of the adverse impacts on salmon that must be considered as part of the environmental baseline. Specifically, NMFS fails to appropriately address the significant impacts the urbanization of the Columbia River watershed, and specifically the area from the Bonneville Dam to the mouth of the river, has had on the species at issue. As discussed below, in order to insure the species' long-term survival and recovery it is critical to preserve the species habitat, yet the Service has not adequately taken these factors into account.

NMFS Has Not Meaningfully Analyzed the Effect of the CRC on the species

The CRC is the largest construction project envisioned for the Columbia River in recent memory. Not that one would know that from BiOp. The curt analysis provided by NMFS on a project of this magnitude, a project which in size and scope is unprecedented since the listing of the salmon species in the area, falls well short of the intent and mandates of the ESA and is a disservice to species NMFS is charged with protecting.

Every BiOp must include a "detailed discussion of the effects of the action on listed species." 50 C.F.R. § 402.14(h). These effects must include both the direct effects, and the indirect effects "caused by the proposed action." *Id.* § 402.02. These impacts must then be added to the cumulative effects of other projects in order to ultimately consider whether this project may jeopardize the species. Here, NMFS has not properly analyzed any of these effects.

a. NMFS Has Failed to Address the Direct and Indirect Impacts the Crossing Will Have on the Species

To begin with, the he effects of an action that must be considered include the "direct and indirect effects . . . together with the effects of other *activities that are interrelated or*

O-002-036

interdependent with that action, that will be added to the environmental baseline." *Id.* (emphasis added). Here, NMFS admits that it has failed to undertake the appropriate analysis, stating "[t]he present level of planning for these actions is not sufficient to support a complete analysis of effects that are reasonably certain to occur on ESA-listed species or their designated critical habitats." BiOp at 19. NMFS' failure to address the effects is without question a fatal flaw that must be remedied before the action is authorized.

Moreover, NMFS' analysis of the direct and indirect impacts the CRC will have on the species addressed is flawed. For example, NMFS in its cursory analysis of the impacts of underwater noise during the construction of the crossing fails to acknowledge the true extent of the potential harm to salmonids. NMFS states "Modeling of the population-level effects pile driving, the primary source of impacts from CRC, shows that the magnitude and temporary duration of those effects will not increase the risk of extinction faced by these species." BiOp at 73.166 This conclusion is dubious because NMFS never fully addresses the impact of the activities authorized here. Specifically, NMFS focuses mainly on the mortality and injury that will from the action, but fails to address the impact to the species of the sub-leathal effects. According to NMFS, all fish will "may experience a temporary threshold shift in hearing due to a temporary fatiguing of the auditory system that can reduce the survival, growth, and reproduction of the affected fish by increasing the risk of predation and reducing foraging or spawning success" at sound levels equal or greater than 150 dB re: 1 μPa^2 BiOp at 62-63. NMFS further states that some activities will cause this level of underwater noise up to twelve miles away from the construction site. *Id.* at 58, Table 24. And, despite the clear limitations on in-water work established to protect salmon species—limitations not discussed in the BiOp—

166 NMFS' conclusion is suspect as it specifically admits previously that "this model was not able to assign those mortalities to individual populations." BiOp at 72.

O-002-036

such activities are allowed to occur year round for up to four years. *Id.* at 78. NMFS fails to explain how these known impacts that will affect all fish within the in-water action area will affect the populations.

Next, NMFS erroneously relies on unspecified and unproven stormwater best management practices (BMPs) to conclude that the CRC is unlike to appreciably reduce the likelihood of survival and recovery of listed species. BiOp at 73. In reality, Oregon and Washington's experience with Industrial General Stormwater Permits and Municipal Separate Storm Sewer System demonstrate stormwater discharges often fail to comply with established permit limits and therefore such permits regularly fail to protect water quality. While the goal of improving stormwater management over existing conditions is necessary, NMFS cannot rely on alleged or anticipated improvements in water quality without quantifying, or at a minimum, estimating the amount of pollution and quantity of annual stormwater discharges.

Furthermore, NMFS fails to meaningfully discuss any impacts, other than stormwater discharge, from the ongoing operation of the crossing. Specifically, NMFS fails to meaningfully address the impact the physical structures both during construction and once built will have on the river and its species. For example, the increased shade areas over the construction period and caused by the bridge itself will significantly alter the habitat it the area. These impact are given little or no consideration in the BiOp. Moreover, the BiOp does not address any noise issues related to the operation of the crossing. It is certainly conceivable that underwater noise created by the bridge will have onging impacts to the nearby habitat quality. In order to give "the benefit of the doubt to the species" required by the ESA, H.R. Conf. Rep. No. 697, 96th Cong., 2d Sess. 12 (1979), NMFS must address all known and potential impacts to the species. Its failure to do so here renders the BiOp arbitrary and capricious.

b. NMFS' Cumulative Effects Analysis Does Not Adequately Address the Many Impacts on the species

O-002-036

NMFS' cumulative impacts analysis is deficient as it wholly fails to address the effects of "future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area." 50 C.F.R. § 402.02. To analyze these impacts correctly, NMFS must describe all relevant future activities and *assess* how those activities would impact the species. *Id.* § 402.14(g)(4); *Greenpeace v. NMFS*, 80 F. Supp. 2d 1137, 1149 (W.D.Wash. 2000) (holding that mere listing of future activities without any explanation or analysis of how those activities may affect the listed species was not sufficient to consider cumulative effects). As a threshold matter, as noted earlier, NMFS' unlawful constriction of the "action area" significantly contributes to this flaw. By limiting the action area to only the in-water portion of the action area, NMFS has ignored upland actions that will occur in the immediate vicinity of the project that may have a cumulative effect on species impacted by the CRC. Indeed, although NMFS notes the likely population growth in the area and identifies some of the potential resulting consequences, NMFS fails to meaningfully address the impact to the area and the species.

The NMFS' Incidental Take Statement also Does Not Comply with the Endangered Species Act

As noted, if, at the conclusion of the consultation, the Service concludes that the action will not jeopardize the listed species, the Service must determine whether the action will result in

O-002-036

the "incidental take" of individuals of the species and what level of such take" will occur.167 Based on this analysis, the Service provides the agency with an "Incidental Take Statement" ("ITS"). 16 U.S.C. § 1536(b)(4); 50 C.F.R § 402.14(i). The ITS provides an exception to the prohibition against take established in Section 9 of the Act by authorizing the "incidental take" of a specific number of individuals of a listed species, where the take "result(s) from, but [is] not the purpose of, carrying out an otherwise lawful activity." 50 C.F.R. § 402.02; see also 16 U.S.C. § 1536(b)(4). An ITS must state the impact that the take will have on the species, identify the "reasonable and prudent measures" ("RPMs") considered necessary to minimize the expected impact, and establish "terms and conditions" necessary for implementation of the RPMs. 16 U.S.C. § 1536(b)(4); 50 C.F.R. § 402.14(i).

Here, the NMFS made two significant flaws in its ITS analysis. First, if NMFS had appropriately assessed the true impacts of this development on the species, it would have reached the singular conclusion that the development would result in the take of a significant number of species. However, as detailed above, the NMFS has failed at each step of the analysis and thus could not have accurately described the true amount of take that will result from this project.

Second, even had the agency properly evaluated the impacts, the ESA requires that NMFS specify the level of take that will occur. 50 C.F.R. § 402.14(i). An ITS must express the amount or extent of take in some form, either as a numeric value or as a surrogate ecological condition that has some connection to the taking of the species. *Arizona Cattle Growers' Ass'n v. U.S. Fish and Wildlife*, 273 F.3d 1229, 1250-51 (9th Cir. 2001). "Incidental Take Statements set forth a 'trigger' that, when reached, results in an unacceptable level of incidental take,

167 "Take" is defined to include engaging in or attempting to engage in conduct that will "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" an individual of a listed species. 16 U.S.C. § 1532(19).

O-002-036

invalidating the safe harbor provision, and requiring the parties to reinitiate consultation." *Id.* at 1249. Rather than comply with this requirement, with regard to take associated with underwater noise, NMFS failed to provide a cap for the amount of take that will occur. *See* BiOp at 77. To the extent NMFS attempted to set a take limit by describing the areas in which take will occur, this fails to comply the ESA as NMFS has simply restated the predicted impacts of the project, without establishing when an unaccpetable level of take is reached. *See Or. Natural Res. Council v. Allen*, 476 F.3d 1031, 1039 (9th Cir. 2007) ("The Incidental Take Statement and BiOp are rendered tautological, they both define and limit the level of take using the parameters of the project."). In short, without actually evaluating the level of this take, the NMFS has violated its obligation to insure that if the authorized level of take is exceeded, consultation will be reinitiated in order to protect against jeopardy.

THE FEIS's EVALUATION OF IMPACTS ON AQUATIC SPECIES VIOALTES NEPA AND THE ESA

The FEIS is so inadequate as to preclude meaningful analysis of salmon and steelhead issues.

The FEIS does not contain a valid and complete analysis of cumulative impacts to salmon and steelhead.

The FEIS is a NEPA document, and NEPA documents must "provide full and fair discussion of significant environmental impacts." 40 C.F.R. §1502.1. Accordingly, FHWA and FTA must take a "hard look" at the significant environmental consequences of the CRC Project. *Kern v. U.S. B.L.M.*, 284 F.3d 1062, 1066 (9th Cir. 2002). "A 'hard look' does not dictate a soft touch or brush-off of negative effects." *Native Ecosystems Council v. USFS*, 428 F.3d 1233, 1241 (9th Cir. 2005). Rather, agencies must "consider every significant aspect of the environmental impact of a proposed action," *Ore. Natural Desert Ass'n v. BLM*, 625 F.3d 1092,

O-002-036

1100 (9th Cir. 2010), which includes the cumulative impacts of a proposed action. *See* 40 C.F.R. §1508.25(c)(3).

A "cumulative impact" is "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. 40 C.F.R. §1508.7. A proper consideration of the cumulative impacts of a project requires "some quantified or detailed information; ... [g]eneral statements about possible effects and some risk do not constitute a hard look absent a justification regarding why more definitive information could not be provided." *Ocean Advocates v. U.S. Army Corps*, 361 F.3d 1108, 1128 (9th Cir. 2004)(*amended opinion*, 402 F.3d at 868).

A cumulative impacts analysis "must be more than perfunctory; it must provide a useful analysis of the cumulative impacts of past, present, and future projects," *Kern v. U.S. Bureau of Land Mgmt.*, 284 F.3d 1062, 1075 (9th Cir. 2002), and explain "how [] individual impacts might combine or synergistically interact with each other to affect the [] environment." *Klamath-Siskiyou Wildlands Ctr. v. BLM*, 387 F.3d 989, 997 (9th Cir. 2004). An agency can address impacts from past actions by providing specific information regarding the aggregate effects of those past actions, but the agency must still address whether and how those past aggregate impacts and the impacts of the agency's current proposal and likely future actions will have cumulative impacts on the environment. *See, e.g., League of Wilderness Defenders v. Allen* 615 F.3d 1122, 1136 (9th Cir. 2010).

O-002-036

Although a proposed action's impact may be minor, combined actions over time may be significant. 40 C.F.R. § 1508.7. Analysis must address combined or synergistic effects in addition to isolated effects. *See Klamath-Siskiyou Wildlands Ctr. v. BLM*, 387 F.3d 989, 997 (9th Cir. 2004). Analysis must be based on quantified or detailed information rather than vague or general statements about possible effects. *Ocean v. U.S. Army Corps*, 361 F.3d 1108, 1128 (9th Cir. 2004) (amended opinion, 402 F.3d at 868). Detailed discussion of such information ensures that the twin aims of NEPA are fulfilled, which are: (1) informed agency decision-making and (2) providing the public with useful information so as to allow public participation in the decision-making process and implementation of that decision. *Oregon Natural Dessert Ass'n v. BLM*, 625 F.3d 1092, 1099 (9th Cir. 2010). NEPA's "chief tool" to accomplish this is the EIS, id. at 11, which serves "to obviate the need for speculation," *Ocean Advocates v. U.S. Army Corps of Engineers*, 402 F.3d 846, 870 (9th Cir. 2005).

The Ninth Circuit has underscored the importance of cumulative impacts analysis. *See Kern*, 284 F.3d at 1076 (EAs require "adequate consideration of cumulative effects" and must be addressed "fully"). This is particularly true in an EIS, which "more thoroughly than an EA, [explores] the environmental consequences of a proposed action whenever 'substantial questions are raised as to whether a project *may* cause significant [environmental] degradation.'" *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1216 (9th Cir. 1998) (quoting *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1149 (9th Cir. 1998)).

The CRC Project FEIS acknowledges that a valid cumulative effects analysis must include an analysis of the incremental impacts of the proposed action together with the effects of other actions. Cumulative Effects Technical Report for the Final Environmental Impact

O-002-036

Statement at 1-11, citing 40 C.F.R. §1508.7. The FEIS then fails to properly analyze the past, present and future actions in the Columbia River Basin that will cumulatively add to the adverse impacts to salmon and steelhead. It is not enough to say that the CRC Project alone has a small effect on these species when the entire purpose of a cumulative impacts analysis is to take a hard look at all the *other* factors that influence ecosystem health. The FEIS fails to adequately disclose, explore or analyze any of these cumulative impacts on salmon and steelhead and is therefore in violation of NEPA.

The FEIS's cumulative impacts analysis is deficient in relation to salmon and steelhead in three major respects. First, it attempts improperly to tier with non-NEPA documents. Second, it fails to consider the effects of the CRC Project itself to salmon and steelhead beyond ESA-listed salmon and steelhead. Third, it fails to discuss the impacts of past authorized take of salmon and steelhead in any detail.

The FEIS's cumulative effects analysis impermissibly tiers to the Biological Assessment and Biological Opinion.

The CRC Project Biological Opinion's cumulative impact analysis is guided by the ESA rather than NEPA, which requires a significantly different and considerably narrower cumulative impact analysis. The ESA requires NMFS to only consider future non-federal activities that are reasonably certain to occur within an action area (*see* 50 C.F.R. § 402.02 (definition of cumulative effects)), whereas NEPA requires FHWA and FTA to consider *all* past, present, and foreseeable future actions, regardless of who performs the action, that combine with the proposed action to cause an incremental environmental impact (*see* 40 C.F.R. § 1508.7).[168] *See*

[168] NMFS itself recently recognized that an ESA cumulative impact analysis is "narrower than the NEPA definition of cumulative impacts." 73 Fed. Reg. 47869 (2008). Moreover, according to the Interior Solicitor, a cumulative impact analysis under the ESA may not consider certain

O-002-036

Portland Audubon Society v. Lujan, 795 F.Supp. 1489, 1509 (D.Or. 1992) (rejecting agency's request for the court to "accept that its consultation with the United State Fish and Wildlife Service under the Endangered Species Act constitutes a substitute for compliance with NEPA."); *Makua v. Rumsfeld*, 163 F.Supp. 2d 1202, 1218 (D.Ha. 2001) (highlighting lower standard applied under NEPA to determine whether an action will have the potential to cause impacts short of extinction and under ESA to determine whether an action will jeopardize). *See also Oregon Environmental Council v. Kunzman*, 714 F.2d 901 (9th Cir. 1983) ("[o]ne agency cannot rely on another's examination of environmental effects under NEPA"). Additionally, unlike a NEPA document, a BiOp is not subject to public comment and scrutiny by non-federal scientists.

The FEIS's Ecosystems section (section 3.16) refers the reader to Appendix K of the Biological Assessment for a "detailed description of estimated impacts to each run" of ESA-listed salmon and steelhead. *Id.* 3-393. Insofar as the FEIS fails to include its own detailed description of estimated impacts to salmon and steelhead, it cannot "tier" to the BA, which is not a NEPA document and is not even incorporated into the FEIS. *See League of Wilderness Defenders-Blue Mountains Biodiversity*, 549 F.3d 1211, 1219 (9th Cir. 2008) (remanding so the USFS can reissue its NEPA documentation to include the omitted, but clearly relevant, information); *Muckleshoot Indian Tribe*, 177 F.3d at 810 (noting that the 9th Circuit "[h]as

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future actions which might be likely to jeopardize a listed species, whereas a cumulative impact analysis under NEPA must consider these projects. Solicitor's Opinion M-36938, Cumulative Impacts under Section 7 of the Endangered Species Act, 88 Interior Dec. 903, 905 (1981). Additionally, the Solicitor determined, unlike under NEPA, the effects of possible future federal actions should not be considered as "cumulative effects" in determining ESA compliance because "all other future federal actions will themselves" be allowed to proceed only if they are later found to comply with ESA. 88 Interior Dec. at 905-07. Further, the preamble to the consultation rules acknowledged that NEPA "warrants] a more expanded review of cumulative effects" and that cumulative effects under the ESA are limited. 51 Fed. Reg. 19933 (June 3, 1986).

O-002-036

previously interpreted the regulations to allow tiering only to another environmental impact statement."); *Or. Natural Res. Council v. U.S. BLM,* 470 F.3d 818, 823 (9th Cir. 2006) (holding similarly proposed tiering impermissible because "the Watershed Analysis is not a NEPA document.").

Similarly, the FEIS attempts to tier to the Biological Opinion itself. *See* FEIS Cumulative Effects section 3.19, at 3-455. The Biological Opinion is not a NEPA document, either, and tiering to it is disallowed as well.

The FEIS's cumulative impacts analysis does not consider the impacts of the CRC Project to salmon and steelhead.

In terms of cumulative impacts, the FEIS's fundamental error is its failure to even consider, much less analyze, the cumulative impacts of the CRC Project along with the existing and likely future impacts of other activities in the Columbia River Basin. These ignored activities include other in-water projects and projects conducted out of the water which affect the watershed by increasing erosion, pollution runoff, or habitat destruction. The missing cumulative impacts analysis should have included both a more specific analysis of the cumulative impacts of these activities on salmon, steelhead, and other species, and a more general analysis of the cumulative impacts of the CRC Project itself and these other activities on resources such as wildlife and aquatic resources. The error here is quite similar to that identified in *Te-Moak Tribe of Western Shoshone v. U.S. Dept. of the Interior*, 608 F.3d 592, 603 (9th Cir. 2010), which invalidated an EA in which the cumulative impacts analysis focused primarily on the impacts of the proposal at issue and included only conclusory assertions of no cumulative impacts.

O-002-036

An interested reader might reasonably look for the FEIS's salmon and steelhead cumulative impacts analysis in the section titled "Cumulative Effects" (FEIS section 3.19). However, that reader would be disappointed because the Cumulative Effects section's "Ecosystems" subsection (FEIS subsection 3.19.18) is only four pages long. *Id*, 3-452 - 3-456. And, other than a discussion of the Biological Opinion's "no jeopardy" and "no adverse modification" conclusions, only *two sentences* out of those four pages are dedicated to considering the impacts of the CRC Project itself to ecosystems. Those two sentences are as follows:

> Although the direct effects of the [CRC Project] would include disturbances to native vegetation, trees, and wetland buffers, the most significant ecosystems effects of the [CRC Project] are changes to aquatic habitat. The [CRC Project] would significantly improve runoff water quality as a result of improved stormwater management, although its in-water bridge piers would have adverse effects on protected fish species in the Columbia River similar to the effects of the existing I-5 bridge piers.

Id. at 3-454. So, the analysis of cumulative impacts to ecosystems in the Cumulative Effects section is limited to an acknowledgment that the CRC Project will "disturb" native vegetation, trees, and wetlands, and that the aquatic habitat will be "affected." Specifically, the aquatic habitat will be affected by "improved" runoff water quality and by "adverse effects" from bridge piers. *Id.* That is all the information given on the effects of the CRC Project to ecosystems, including salmon and steelhead, in the Cumulative Effects section of the FEIS. This "analysis" does not satisfy NEPA.

O-002-036

The observant interested reader, however, will not be dismayed by the lack of information in the Cumulative Effects section itself. That reader will have noticed that the introduction to the Cumulative Effects section refers to that section's technical report, stating that "[t]he information in [the Cumulative Effects section] is based on more detailed information in the CRC Cumulative Effects Technical Report." *Id.* at 3-429. Accordingly, the reader will make his way to the Cumulative Effects Technical Report to satisfy his curiosity regarding the CRC Project's cumulative impacts to salmon and steelhead. Unfortunately, however, the reader will not find "more detailed information" regarding cumulative effects to ecosystems in the Cumulative Effects Technical Report. Rather, he will find *even less* information on ecosystems than was included in the Cumulative Effects section itself.

In the Cumulative Effects Technical Report, the impacts of the CRC Project to ecosystems are addressed in a mere *two paragraphs*. Those two paragraphs, in their entirety, are as follows:

> Although the effects of [the CRC Project] would include disturbance to native vegetation and trees and wetland buffers, the most significant ecosystems effects of the [CRC Project] are beneficial changes to aquatic habitat. The [CRC Project] would significantly improve water quality in area waterways as a result of improved stormwater management, although its in-water bridge piers would have adverse effects on protected fish species in the Columbia River similar to the effects of the existing I-5 bridge piers.
>
> The [CRC Project] would also remove the peregrine falcon habitat in the steel structure of the existing I-5 bridges. Whether these effects are temporary, with peregrine falcons reestablishing themselves on new bridge structures, or permanent, long-term adverse effects on the overall viability of the species are not anticipated.

O-002-036

Id. 3-1 to 3-2. Notably, the first paragraph is almost identical to the cumulative impacts treatment in the main Cumulative Effects section. The only real difference between the technical report language and the language in the main Cumulative Effects section is the addition of the second paragraph addressing peregrine falcons in two sentences. With analysis like this in the "more detailed" technical report, the reader wonders if he miscomprehends the meaning of the word "technical." This is not a detailed or quantitative discussion as required by NEPA. *See Ocean v. U.S. Army Corps*, 361 F.3d at 1128. NEPA requires more specificity than this. *See Kern*, 284 F.3d at 1076.

Having read the entire Cumulative Effects section and the entire Cumulative Effects Technical Report, and being left with no real analysis of the impacts of the CRC Project on salmon and steelhead, our hypothetical interested reader would likely be showing signs of wear. However, he might still take a hopeful glance at the Ecosystems section of the FEIS (FEIS section 3.16). Regrettably, however, the Ecosystems section is also extremely vague and does not, even once, use the word "cumulative."

What about the Ecosystems Technical Report, though? After all, the Ecosystems section says "[t]he information presented in this section is based on the CRC Ecosystems Technical Report." *Id.* at 3-371. Once again, however, the interested reader will be foiled. The Ecosystems Technical Report does not analyze *any* cumulative effects from the CRC Project. *Id* at 2-6. Instead, the Ecosystems Technical Report refers the interested reader to the Cumulative Effects Technical Report for an analysis of cumulative effects from the CRC Project, stating that "[p]otential cumulative effects from [the CRC Project] are evaluated in the Cumulative Effects

O-002-036

Technical Report. Please refer to [the Cumulative Effects Technical Report] for an evaluation of possible cumulative effects." *Id.* Alas, as already discussed, the Cumulative Effects Technical Report contains only two paragraphs relevant to the cumulative impacts of the CRC Project on ecosystems, including salmon and steelhead.

In conclusion, the FEIS offers a cursory and wholly inadequate treatment of cumulative impacts from the CRC Project to salmon and steelhead and therefore violates NEPA.

The FEIS's cumulative impacts analysis does not consider the impacts of numerous past and ongoing activities to salmon and steelhead.

The Cumulative Effects section of the FEIS (FEIS section 3.19) does not address past or present projects other than the CRC Project that affect salmon and steelhead. Rather than engaging in detailed analysis, the Cumulative Effects ecosystems section (FEIS subsection 3.19.18) reads like a general encyclopia article on ESA-listed pacific salmon. Rather than discussing any specific projects that adversely affect salmon and steelhead, the section offers an extremely generalized review of ESA-listed species and how climate change is likely to affect those species in the future. The section does cite a 2010 status review of ESA-listed salmon and steelhead, but offers no details and no specificity. Futhermore, even though NEPA environmental analysis is not limited to effects on ESA-listed species, there is no mention whatsoever of salmon and steelhead ESUs that are *not* listed under the ESA (including the Okanogan River and Lake Wenatchee sockeye salmon ESUs; the middle Columbia River spring-run and upper Columbia River summer/fall-run, and Deschutes River summer/fall-run chinook ESUs; the Southwest Washington steelhead ESU; and the pink salmon ESUs).

O-002-036

The Cumulative Effects Technical Report is no better. After its perfunctory treatment of the effects of the CRC Project itself on ecosystems, the Cumulative Effects Technical Report goes on, in only four paragraphs, to describe the "Effects from Other Actions (Past, Present, Future)" that also play into the cumulative impacts analysis. *Id.* at 3-2. Almost needless to say, those four paragraphs do not describe *any* other projects that affect salmon and steelhead. Rather, the section generally emphasizes that protected fish species' true concern should not be the CRC Project, but instead climate change, hydropower dams, hatcheries, and fisherman. Such cursory "analysis" fails to meet the requirement for high quality scientific analysis as required by 40 C.F.R. §§ 1502.24 and 1500.1(b).

Similarly, discussion of mitigation cannot be substituted for analysis of impacts. *See Te-Moak Tribe*, 608 F.3d at 604-05 (BLM's cumulative impacts analysis in Environmental Assessment ("EA") inadequate). In *Te-Moak Tribe*, the EA concluded that no cumulative effects would occur because all effects from mining exploration would be "avoided or mitigated." *Id.* at 604. Such vague discussion of cumulative impacts is inadequate. *Id.* FHWA and FTA make the same mistake when concluding that impacts are "small" or will be avoided. *See, e.g.*, Cumulative Impacts Technical Report at 3-2. The FEIS goes even further and passes responsibility for the salmon and steelhead to the Basinwide Salmon Recovery Strategy, notably *not* a NEPA document and out of the control of the CRC. *Id.*

The FEIS is actually open about its failure to consider and analyze projects other than the CRC Project. For example, the Cumulative Effects section of the FEIS states that "[w]hile not

O-002-036

explicitly identified and analyzed, ongoing and future federal projects such as the Federal Columbia River Power System and salmon recovery efforts were taken into account during the project development and ESA analysis." Cumulative Effects, 3-455. There is an irony here, however, because the Cumulative Effects section goes on to say that, in the future, agencies will be required to analyze the CRC Project as part of their Biological Assessments and Biological Opinions: "future federal actions must comply with Section 7(a)(2) of the ESA, requiring federal action agencies to ensure that their actions do not result in jeopardy or adverse modification of critical habitat, and Section 9 of the ESA criminally and civilly prohibits any person to take a listed species or critical habitat in the future. *When future federal actions occur, the CRC project would be analyzed as an existing condition, if the CRC project is in construction or has been completed." Id.* (italics added; internal quotation marks omitted). Because NEPA cumulative impacts analysis is much broader than ESA cumulative impacts analysis, this statement is an admission that individual projects, such as the CRC Project, must be "analyzed as [] existing condition[s]" in the cumulative impacts section of an EIS. The irony is that FHWA and FTA have completely failed to undertake any such analysis of their own.

In sum, the FEIS hardly touches on the combined cumulative impacts and briskly brushes off all negative effects. NEPA's "hardlook" requires more from FHWA and FTA. *Native Ecosystems*, 428 F.3d at 1241.

FHWA and FTA have failed to ensure their actions will not violate section 7(a)(2) of the Endangered Species Act.

O-002-036

The ESA represents "an explicit congressional decision to require agencies to afford first priority to the declared national policy of saving endangered species." *Tennessee Valley Authority v. Hill*, 437 U.S. 153, 185 (1978). Section 7 of the statute requires that every federal agency "shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [critical] habitat of such species…." 16 U.S.C. § 1536(a)(2). This provision gives rise to both substantive and procedural obligations. A federal agency proposing to take or authorize an action that may affect listed species or designated critical habitat must, in cases involving Pacific salmonids, consult with NMFS pursuant to the procedures set forth in section 7. This culminates in NMFS issuing a Biological Opinion that provides advice as to whether the proposed agency action is likely to jeopardize listed species or adversely modify critical habitat. Substantively, federal action agencies have a free-standing obligation to ensure that their actions do not run counter to section 7's prohibitions; an agency cannot "abrogate its responsibility to ensure that its actions will not jeopardize a listed species; its decision to rely on a [ ] biological opinion must not have been arbitrary or capricious. *Resources Limited v. Robertson*, 35 F.3d 1300, 1304 (9th Cir. 1993) (internal citations omitted). Both NMFS and action agencies must use "the best scientific and commercial data available" in complying with section 7. 16 U.S.C. § 1536(a)(2).

On February 23, 2004, NMFS issued a Biological Opinion that examined "all basins in Oregon with anadromous fish use…or designated critical habitat." Biological Opinion on EPA's Proposed Approval of Revised Oregon Water Quality Standards at 6. In that Biological Opinion,

O-002-036

NMFS determined the degraded status of listed salmon and steelhead habitat throughout the state "is such that there must be a significant improvements [sic] in the environmental conditions [these fish] experience," and declared that "[a]ny further degradation of these conditions would significantly reduce the likelihood of survival and recovery of these species." *Id.* at 24. NMFS regulations define "jeopardize the continued existence of" as engaging in an action that "reduce[s] appreciably the likelihood of both the survival and recovery of the species in the wild…." 50 C.F.R. § 402.02. Regulations define "destruction or adverse modification" of critical habitat in a similar manner. *See id.*

FWHA, FTA, and NMFS have failed to ensure that the CRC Project is not likely to jeopardize salmon and steelhead ESUs listed as threatened under the Endangered Species Act, 16 U.S.C. §1531 et seq. (ESA), or destroy or adversely modify these species' designated critical habitat. Without any means of accurately determining the current status of these fish and their habitat, keeping track of authorized mortality and injury to these populations, and assessing implementation of measures determined by NMFS as necessary to comply with section 7 of the ESA, allowing additional adverse impacts to these species and their critical habitat is unlawful.

The CRC Project is merely one of a long litany of projects carried out or approved by federal agencies with similar, or in some cases more extensive, adverse impacts on these highly imperiled fish. For example, in 2008 NMFS determined that two of the listed evolutionarily significant units (ESUs) affected by the CRC Project face jeopardy to their continued existence and destruction or adverse modification to their critical habitat unless the U.S. Army Corps of Engineers (Corps) and others implement a long list of measures to improve survival of these fish and restore their habitat. Nevertheless, NMFS lacks any sort of mechanism to keep track of accumulated adverse impacts to listed salmonids and their habitat, including death and injury to

O-002-036

these fish expressly authorized by NMFS. NMFS also appears to have no system for assessing whether the measures identified as necessary to avoid jeopardy and adverse modification of the ESUs' critical habitat are actually being implemented or are effective. Thus even the "small" impacts of the CRC Project could, to use a familiar analogy, potentially be the straw that breaks the camel's back for Columbia River Basin salmon and steelhead near extinction.

Section 7 does not prohibit all negative impacts on listed salmon and steelhead or their critical habitat; rather, it only prohibits agency actions that have the effect of jeopardizing an *entire* listed ESU or adversely modifying the conservation value of an *entire* critical habitat designation. *See* Consultation Handbook at 4-36 and 4-39.[169] A Department of Interior Solicitor's opinion, included as an appendix to the Handbook, explained the implications of these broadly focused prohibitions as follows:

> [A] project passing muster under section 7 is in effect allocated the right to consume (and is presumed to utilize) a certain portion of the remaining natural resources of the area. It is this "cushion" of remaining natural resources which is available for allocation to projects until the utilization is such that any future use may be likely to jeopardize a listed species or adversely modify or destroy its critical habitat. At this point, any additional federal activity in the area requiring further consumption of resources would be precluded under section 7.

Cumulative Effects to be Considered Under Section 7 of the Endangered Species Act, August 27, 1981 at 6 (this opinion is SO-3 in Appendix D of the Handbook). This "straw that breaks the camel's back" approach to assessing jeopardy and adverse modification of critical habitat obviously makes it crucial for federal agencies and NMFS to keep careful track of the "cushion" of remaining resources available for allocating to actions that adversely affect ESUs and their critical habitat.

[169] The Consultation Handbook was jointly published by FWS and NMFS to provide greater detail on the substantive and procedural requirements of section 7; it is available at http://www.fws.gov/endangered/esa-library/index.html#consultations_policy.

O-002-036

Through the section 7 process, NMFS may also authorize federal actions to cause "incidental take" of protected ESUs, which but for such authorization would generally be illegal under section 9's prohibition against take. See 16 U.S.C. § 1538(a)(1)(A). "Incidental" take refers to death or injury to listed species "that result from, but are not the purpose of, an otherwise lawful activity." *Id.* NMFS may issue an "incidental take statement" (ITS) as part of a biological opinion; an ITS authorizes incidental take resulting from an agency action so long the level of take does not otherwise violate section 7(a)(2) and the federal agency implements "reasonable and prudent measures" to minimize incidental take. *See* 16 U.S.C. § 1536(b)(4). Congress intended NMFS to specify numeric estimates of incidental take in an ITS if such an estimate can be "practically obtained," though the Service may employ a "surrogate" for estimating incidental take provided "these conditions are linked to the take of the protected species." *Arizona Cattle Growers Ass'n v. U.S. Fish and Wildlife Service*, 273 F.3d 1229, 1250 (9th Cir. 2001).

Taken together, the provisions of section 7 and its implementing documents require NMFS to determine the current status of a species and its critical habitat – as affected by all previously authorized federal actions, all past and present non-federal activities, and future non-federal actions "reasonably certain" to occur – in assessing whether a proposed federal action is likely to jeopardize listed ESUs or destroy or adversely modify critical habitat. This analysis of the current status of the species also must consider all past "incidental take" authorized by the Service. Only if a proposed action that will have adverse effects on listed ESUs and critical habitat will not tip the species into jeopardy or adversely modify its critical habitat may the action proceed. NMFS, FHWA, and FTA have failed to undertake any of this analysis.

O-002-036

To illustrate what might be a possible potential starting point for NMFS' analysis of past incidental take, please refer to Appendices A, A1, B, B1, and B2 in ESA Exhibits Folder. For a compilation of all biological opinions issued by NMFS since January 1, 2005, in relation to salmon and steelhead ESUs affected by the CRC Project, see the attached folder entitled "Biological Opinions.2005-01-01 to 2011-01-19." Many, if not all, of these biological opinions should have been considered in some detail and in some meaningful way, by NMFS in issuing the Biological Opinion and by FHWA and FTA in the FEIS.

The Biological Opinion issued by NMFS is inadequate and does not ensure compliance with the Endangered Species Act.

Section 7 regulations set forth the procedure for NMFS to assess whether a proposed action is likely to tip an ESU into jeopardy or adversely modify designated critical habitat. NMFS must first evaluate the "current status of the species or critical habitat," 50 C.F.R. §402.14(g)(2), which the Handbook describes as "the effects of all past human and natural activities or events that have led to the current status of the species" or critical habitat. Handbook at 4-19. Next, NMFS must evaluate "the effects of the action and cumulative effects on the listed species or critical habitat." 50 C.F.R. §402.14(g)(3). The regulations define "effects of the action" to include direct and indirect effects of the action that will be added to the "environmental baseline." 50 C.F.R. §402.02. The "environmental baseline" includes "the past and present impacts of all Federal, State, or private actions and other human activities in the action area," *Id.,* which the Handbook characterizes as a "snapshot" of a species' health at a specified point in time. Handbook at 4-22. The "action area" means "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the

O-002-036

action." 50 C.F.R. § 402.02. Finally, "cumulative effects" include the effects of future non-Federal activities reasonably certain to occur in the action area. *See id.*

If NMFS determines that a proposed federal action is likely to cause jeopardy to a listed ESU or adversely modify designated critical habitat, it must suggest "reasonable and prudent alternatives," if any, which would allow the federal agency to accomplish the goal of its proposed action to the degree possible within its authority without running afoul of section 7(a)(2). 16 U.S.C. §1536(b)(3)(A).

NMFS' CRC Project Biological Opinion is inadequate because it has a flawed assessment of the statuses of the salmon and steelhead ESUs and the Incidental Take Statement is unlawful.

The Biological Opinion's evaluation of the statuses of listed salmon and steelhead and their critical habitat is inadequate.

The Biological Opinion does not consider the best available science.

Section 7(a)(2) of the ESA, 16 U.S.C. §1536(a)(2), requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of listed species or destroy or adversely modify these species' designated critical habitat. The section 7 consultation process assists federal agencies in complying with this mandate. In fulfilling both their substantive and procedural mandates under this section, the ESA requires federal agencies to use "the best scientific and commercial data available." *Id.*

Courts interpret this "best science" mandate to require that federal agencies consider all available information relevant to complying with section 7. In *Conner v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1988), the Ninth Circuit emphasized that agencies "cannot ignore available biological information or fail to develop projections of [actions affecting listed species] which may indicate potential conflicts between development and the preservation of protected species."

O-002-036

See also Kandra v. U.S., 145 F. Supp 2d 1192, 1208 (D. Ore. 2001) ("The Ninth Circuit has interpreted this provision to mean an agency cannot ignore available biological information."); *Southwest Center for Biological Diversity v. Babbitt*, 215 F.3d 58, 60 (D.C. Cir. 2000) (the best science requirement "prohibits the Secretary from disregarding available scientific evidence that is in some way better than the evidence he relies on."). The Biological Opinion does not satisfy this "best science" requirement.

The Biological Opinion does not consider the 2010 *Status review update for Pacific salmon and steelhead listed under the ESA*.

On December 10, 2010, NMFS released the *Status review update for Pacific salmon and steelhead listed under the Endangered Species Act*. This document updated the last formal status update, issued in 2005. This document, although available before the Biological Opinion was issued in early 2011, was not considered or cited in the Biological Opinion. As NMFS issued both the status update and the Biological Opinion, it was aware of the development of both documents and surely would have considered the status update to be some of "the best available science." NMFS therefore easily could have included a discussion of the status update in the Biological Opinion. Its failure to do so renders inadequate the Biological Opinion's evaluation of the statuses of listed salmon and steelhead and their critical habitat. *See also* Appendix A and Appendix B.

The Biological Opinion does not consider additive adverse impacts from prior-issued Incidental Take Statements.

When formulating a biological opinion NMFS has an obligation to evaluate both the "current status of the listed species or critical habitat," as well as the "effects of the action." 50 C.F.R. §402.14(g)(2) and (3). The regulations further define the latter to include a "snapshot" of the species' and critical habitat's health in light of all actions that have previously taken place in

O-002-036

the action area. *See supra* at 3-4. The court carefully examined these requirements in *Fund for Animals v. Babbit*, 130 F.Supp 2d 121 (D.D.C. 2001). Pointing to other federal actions also affecting endangered desert pronghorn which the challenged biological opinion did not consider, the court found that the Biological Opinion had improperly looked at the proposed action's impact on pronghorn "in isolation" from other impacts on the species, and held that FWS had acted unlawful by failing to "analyze the effects of the action in conjunction with the effects of other agencies' actions on the pronghorn." *Id.* at 121, 128. The court also determined that FWS had too narrowly defined the "action area" of the project under consideration in order to "avoid taking into account the impacts of other federal activities on the pronghorn." *Id.* at 129.

Finally, the *Fund for Animals* court noted that FWS had failed to keep track of all incidental take of pronghorn. It observed that "FWS has authorized a total level of take greater than the incidental take provided for in any individual BO without analyzing whether that total level jeopardizes the survival of the pronghorn species." *Id.* at 130. Thus FWS' failure to account for additive incidental take from all federal actions was unlawful because "[w]hile the take of one or two pronghorn as a result of a particular activity may not jeopardize the species as a whole, the aggregate take of pronghorn resulting from each federal activity affecting pronghorn may pose such a risk." *Id.*

Like FWS in the pronghorn case, NMFS in the CRC Project Biological Opinion has failed to consider other federal actions' impacts on listed ESUs and critical habitat. NMFS did not consider or analyze the adverse impacts identified in any of its previous Biological Opinions in assessing the "current status" in 2011 of listed ESUs and critical habitat affected by the CRC Project. Although NMFS does cite a few Biological Opinions (notably the FCRPS and

O-002-036

Willamette Project Biological Opinions), it does not offer any analysis or detail of the impacts of those projects.

Even more obvious is NMFS' complete failure to keep track of total incidental take of listed salmon and steelhead ESUs. Almost all of the hundreds of biological opinions NMFS has issued for projects with adverse impacts on listed Columbia River Basin salmon and steelhead ESUs have included ITSs authorizing some level of incidental take of these fish. However, just as the *Fund for Animals* court pointed out with respect to desert pronghorn and the GAO report documented for most other species overseen by FWS, NMFS lacks any system for keeping a tally over time of incidental take of salmon and steelhead it authorizes. Yet the agency continues again and again to issue additional authorizations to incidentally kill or injure species – as it did in the CRC Project Biological Opinion. These allowances permit death and injury to species which NMFS expressly acknowledges are near extinction. Information about take previously authorized by NMFS is obviously available to the agency by simply examining its prior incidental take statements, yet NMFS did not consider this information prior to issuing the incidental take statement as part of its CRC Project Biological Opinion.

NMFS must make decisions as to whether a proposed federal action is likely to jeopardize the continued existence of listed species or destroy or adversely modify their critical habitat by assessing a proposed action's impacts on the *entire* species and *entire* critical habitat designations. This means that as long as the species as a whole remains viable, or a species' overall critical habitat can still fulfill its conservation function, adverse effects on listed species and their critical habitat, no matter how large, do not run afoul of section 7(a)(2). Conversely, under this scheme even a small localized impact to the species and/or critical habitat can tip a species into jeopardy, or critical habitat into adverse modification, if the species or its habitat as a

O-002-036

whole has declined to the point at which no "resource cushion" of allowable impact remains. This system of assessing jeopardy and adverse modification clearly puts a premium on accurate and up-to-date information on the status of affected ESUs and their critical habitat, including the total number of fish authorized to be killed or injured. Instead, NMFS simply repeats essentially the same version of the "current status" of these species and their habitat each time it formulates a biological opinion. Given that the current status of the ESUs and their habitat virtually do not change – even after NMFS repeatedly authorizes additional adverse impacts and additional take of individuals – it is obviously not difficult for NMFS to continue to allow more such impacts. In other words, it's easy to feel comfortable loading more straws onto the camel when one never counts the straws.

Unfortunately, FWS and NMFS have had difficulties keeping track of the status of listed species in attempting to fulfill their role in the section 7 process. A 2009 report by the Government Accountability Office found that FWS was unable to account for required monitoring reports for the majority of biological opinions it issued, meaning that FWS was unable to accurately track accumulated impacts on listed species. *See* GAO Report 09-550, entitled "The U.S. Fish and Wildlife Service Has Incomplete Information about Effects on Listed Species from Section 7 Consultations" (available at http://www.gao.gov/search?q=09-550). The GAO also found that FWS "lacks a systematic method of tracking cumulative take for most species," and concluded that "[w]without cumulative take information, the Service may not be able to effectively evaluate the collective impacts of federally authorized actions over time, across multiple offices, and across species' ranges. Although one action may not unduly harm a listed species, cumulative effects over time and across landscapes could lead to a species' demise without the Service's knowledge or ability to respond." GAO Report at 16, 26. As the facts of

O-002-036 this case demonstrate, NMFS' procedures for fulfilling its section 7 responsibilities suffer from exactly the same deficiencies outlined in the GAO report.

Finally, even when incidental take statements issued by NMFS *have* provided actual numeric estimates of the number of salmon and steelhead likely to be killed or injured by a proposed project, NMFS did not even consider this take in the CRC Project Biological Opinion and ITS prior to allowing additional incidental take of affected ESUs. This demonstrates NMFS' complete lack of effort to track total take of listed ESUs over time, no matter how it is quantified or estimated. However, there obviously must be some limit on the additive amount of take over time that NMFS can authorize without resulting in jeopardy – as the GAO recognized in its report on FWS' failure to track overall take authorized by the agency. *See* supra at 3. Failing to consider even numerically estimated take in its past ITSs prior to authorizing additional take renders the CRC Project Biological Opinion inadequate.

Tracking Implementation of the Willamette Project RPA.

The Willamette River and the habitat it provides for threatened salmon and steelhead are fundamentally degraded and altered from historic conditions. Since the 1870s, development began to strip away the riparian forests surrounding the river, resulting in large functional losses to the river's complexity and productivity and reducing the amount of habitat crucial for salmon and steelhead. Once highly braided and complex, the Willamette River system was also dramatically simplified through activities such as channelization and the placement of bank stabilizing "revetments." The river banks are now lined with more than 96 miles of revetments, about half of which the Corps constructed. These activities and the resulting impacts reduced available salmonid rearing habitat by as much as 75 %. Moreover, thirty-seven dams in the basin now block salmonid access to more than 435 miles of important stream and river spawning

O-002-036

habitat in the Willamette Basin, and altering temperature regimes in the Willamette River and its tributaries. Finally, while human civilization has advanced in the region, water quality, salmon and steelhead and their habitat have suffered further due to agriculture, urbanization, mining, and timber harvest; adverse impacts from river dredging and associated industrial activities resulted in additional additive harm

As a result of these impacts, salmon and steelhead in the Willamette River have declined to the point that they are facing extinction. In 1999, NMFS listed the Upper Willamette River (UWR) chinook[170] and steelhead[171] ESUs as threatened under the ESA. In 2005, NMFS designated extensive portions of the Willamette Basin as critical habitat for UWR chinook and steelhead. These ESUs are adversely affected by the CRC Project and are addressed in the CRC Project Biological Opinion.

On July 11, 2008, NMFS issued a Biological Opinion for the Army Corps of Engineers' ("the Corps") operation of the that agency's Willamette Project dam system; this Biological Opinion determined that the agency's proposed operation of the dams was likely to jeopardize the continued existence of UWR chinook and UWR steelhead, as well as destroy or adversely modify these ESUs' critical habitat. The action area described in NMFS' 2008 Willamette Project Biological Opinion was expansive, including "[a]ll river reaches, riparian zones, and floodplain areas located downstream of the 13 Willamette Project dams, including the mainstem Willamette River…". As required by the ESA, NMFS specified a reasonable and prudent alternative ("the RPA") to the Corps' proposed operations that would allow the Corps to operate its dams in a manner that avoids jeopardy and destruction or adverse modification of critical habitat. The RPA requires the Corps, in cooperation with other federal agencies and the State of

[170] *Id.*
[171] 64 Fed. Reg. 14,517 (Mar. 25, 1999).

O-002-036

Oregon, to implement a comprehensive slate of measures to improve survival of Willamette salmon and steelhead and to improve their habitat, including steps to improve hatchery practices, increase water flows and improve water quality, restore habitat throughout the Willamette Basin, and even allow for fish passage over several of the Corps' dams in the Willamette Basin. These measures will take many years and millions of dollars to fully implement. The Biological Opinion calls for a timeline for these measures, as well as creation of a detailed organizational structure to oversee implementation of the RPA; the Corps and NMFS are part of each element of this structure.

Between the issuance of the Willamette Project Biological Opinion on July 11, 2008, and the issuance of the CRC Project Biological Opinion on January 19, 2011, NMFS issued 69 additional Biological Opinions for projects affecting UWR chinook salmon, and 60 additional Biological Opinions for projects affecting UWR steelhead, almost all finding additional adverse impacts to those ESUs and their critical habitat, and all concluding that the proposed actions would not result in jeopardy or destruction or adverse modification of critical habitat. In each of these Biological Opinions, however, NMFS has not evaluated whether the habitat restoration requirements or any other substantive elements of the 2008 Willamette Project Biological Opinion's RPA have been implemented or have been effective in improving survival of UWR chinook and UWR steelhead.

Additionally, NMFS has continued to authorize adverse impacts and incidental take even though NMFS' 2008 BiOp for the Corps' Willamette Project found jeopardy and adverse modification for UWR chinook and steelhead (the "action area" for this action extends from and includes the mainstem Willamette and the Columbia River from the confluence of the Willamette and Columbia rivers). NMFS' Executive summary of the Willamette Project

O-002-036

Biological Opinion points out that the RPA set forth in the Biological Opinion (and adopted by the Corps) includes "many measures… that the Action Agencies will carry out in the shorter term that will ensure that the UWR chinook will not go extinct in the near future." The Corps also issued its own explanation of the Willamette Project Biological Opinion and RPA, which asserts that these documents "require monitoring and reporting to ensure compliance with [RPA] requirements."

Quite clearly, it would be problematic – if not impossible – for NMFS to approve additional adverse impacts on listed ESUs and their designated critical habitat if those species were already facing jeopardy and destruction and adverse modification of their critical habitat due to prior federal agency actions. *See* Solicitor's Opinion, supra at 3 (once a species reaches the jeopardy threshold, "any additional federal activity in the area requiring further consumption of resources would be precluded under section 7"). However, there is no indication in the CRC Project Biological Opinion that NMFS considered any information related to whether the Corps and cooperating entities are implementing the Willamette Project Biological Opinion's RPA, including short-term measures identified by NMFS as needed to avoid extinction of UWR chinook, and whether those measure have proven to be effective. This information is highly relevant to assessing whether the Corps, in continuing to operate the Willamette Project, is avoiding jeopardy to UWR chinook and steelhead and adverse modification to their critical habitat throughout the watershed. Additionally, this information is (or at least should be) readily available to NMFS given that the agency is part of every work group and decision-making body for implementing the RPA.

NMFS' failure to consider in the CRC Project Biological Opinion whether the UWR ESUs remain in a jeopardy and adverse modification situation necessarily results in one of two

O-002-036

scenarios. First, NMFS could have simply failed to consider available information relevant to this question, including the monitoring information required by NMFS in its Willamette Project Biological Opinion and RPA. In that case, NMFS has clearly failed to consider the best science available in completing its CRC Project Biological Opinion. On the other hand, NMFS and the Corps could be neglecting to strictly monitor implementation and effectiveness of the Willamette Project Biological Opinion's RPA. In that case, FHWA and FTA would be failing to comply with their section 7 duties by proposing additional impacts to the UWR ESUs from the CRC Project without knowing whether the Corps has been taking the steps already identified as necessary to avoid jeopardy and adverse modification to these ESUs. Additionally, NMFS would lack sufficient data to render a biological opinion on the CRC Project. *See* 50 C.F.R. §402.14(f) (allowing NMFS to request additional data it concludes would "provide a better information base from which to formulate a biological opinion").

In sum, NMFS has, or should have, ready access to information not only relevant, but vital to its assessment as to whether the proposed CRC Project is likely to jeopardize the affected salmon and steelhead ESUs and their critical habitat. Information in prior Biological Opinions and incidental take statements issued by NMFS, as well as monitoring data relevant to measures set forth in the Willamette Project RPA, constitutes the "best science" regarding the status of ESUs and their critical habitat affected by the CRC Project. This information was clearly available to NMFS, yet there is no indication that the agency considered it in formulating its CRC Project Biological Opinion. NMFS thus violated its duty under section 7 to use the best available science.

The Biological Opinion's Incidental Take Statement is unlawful.

O-002-036

The CRC Project Biological Opinion's incidental take statement (ITS) allows for incidental take of fish throughout the duration of the project without a numeric estimate of, or limitation on, the actual number of juvenile fish likely to be killed or injured. In addition to NMFS' failure to track the impacts of additive incidental take the agency has authorized over time, the ITS itself is unlawful. In fact, this ITS provides a good indication as to why NMFS has no method to keep track of overall incidental take.

In *Ariz. Cattle Growers' Ass'n v. U.S. Fish & Wildlife*, 273 F.3d 1229, 1250–51 (9th Cir. 2001), the Ninth Circuit discussed the Services' authority to authorize incidental take. Citing NMFS' and FWS' Consultation Handbook, the court noted that if the Service uses a surrogate for estimating the extent of incidental take rather than providing a numeric limit, the agency "must establish a link between the activity and the taking of species." *Id*. at 1250. In *ONRC v. Allen*, 476 F.3d 1031, 1040 (9th Cir. 2007), the court noted that ITSs "also provide for ongoing monitoring of incidental take by the action agency and the FWS." Part of this monitoring function allows the action agency to know when it has incidentally killed or injured too many members of the listed species, thus triggering its duty to reinitiate formal consultation under section 7. *See id*. at 1039 (finding an ITS illegal when its "permissible level of take is coextensive with the project's own scope"). The court emphasized that the chosen surrogate in an ITS "must be able to perform the functions of a numerical limitation." *Id*. at 1038

The CRC Project ITS says "the extent of take is defined as the area where the CRC action will: (1) Reduce water quality during construction and through stormwater discharge for the life of the CRC; (2) produce harmful underwater noise during construction; and (3) convert benthic foraging habitat to less productive aquatic habitat types during construction and for the life of the CRC." While all of these surrogate indicators are inadequate, the "benthic foraging habitat"

O-002-036

surrogate is the most obviously deficient. That surrogate is characterized as follows: "[t]he extent of take due to loss of benthic foraging habitat is described by the area permanently displaced by bridge columns, *i.e.*, 0.17 acre. Thus, the best available indicator for the extent of this loss is 0.17 acre." However, this level of incidental take is "coextensive with the project's own scope" and both "define[ ] and limit[ ] the level of take using the parameters of the project," which the court found unlawful in *ONRC v. Allen*, 476 F.3d at 1039.

Even more importantly, by failing to link these surrogate measures of incidental take to actual death or injury to members of listed ESUs, NMFS has eliminated the monitoring value of the ITS. Although turbidity and noise levels can be measured, NMFS has articulated no means that these measurements relate to how many fish will be taken. The ITS thus does not provide a meaningful measure of incidental take by the proposed CRC Project. Accordingly, it is impossible for NMFS to keep track of the total amount of take that it has authorized over time, as incrementally increased by the CRC Project ITS. Lacking any ability to track total incidental take authorized by NMFS, the agency has no way to assess whether the additional increment of incidental take it authorized in the CRC Project Biological Opinion will jeopardize the continued existence of the ESUs affected by the project, as it must under section 7. *See* 16 U.S.C. §1536(b)(4)(A). NMFS' use of surrogates for defining allowable incidental take without linking those surrogates in a meaningful way to actual take is much like tracking one's bank account withdrawals by taking notes such as "today I took some money out of my account," and "yesterday I withdrew a bit from my account." Such notations are just as meaningless for tracking total withdrawals of money from a bank account as "[no] more than a 10% cumulative increase in natural stream turbidity 300 feet from an upland or in-water CRC construction activity" is for keeping track of the number of total salmon and steelhead injured or killed.

The FEIS's ESA analysis is inferior to the Biological Opinion's ESA analysis, and therefore does not ensure compliance with the ESA.

O-002-036

FHWA and FTA have free-standing obligations to ensure that their actions are not likely to jeopardize affected ESUs or destroy or adversely modify their critical habitat. *Resources Limited v. Robertson*, 35 F.3d 1300, 1304 (9th Cir. 1993) (internal citations omitted). Despite this obligation, FHWA and FTA have completely failed to independently consider information described in the above subsections, despite the fact that this information is also readily available to these agencies. The FEIS simply parrots the conclusions of NMFS' Biological Opinion with no independent analysis. Accordingly, the action agencies' conclusion that they have fulfilled their duty under section 7(a)(2) to ensure against jeopardy and destruction or adverse modification of critical habitat is arbitrary.

The Biological Opinion and FEIS do not adequately address in-water work window (IWWW) issues.

The normal in-water work window (IWWW) for work in the Columbia River is November 1 through February 28. Oregon at 2, ESA Exhibits Folder. However, the CRC Project proposal includes in-water work from at least September 15 to April 15, and possibly even year round.

The in-water work window guidelines are based on ODFW district fish biologists' recommendations, with primary consideration given to important fish species including anadromous and other game fish and threatened, endangered, or sensitive species. *Id.* at 1. While ODFW has not issued a variance to the normal in-water work window, NMFS, in its Biological Opinion, expresses its approval of an expanded in-water work window for the CRC Project. CRC Biological Opinion, at 80. Incredibly NMFS routinely denies such variances for project's with

O-002-036

much smaller potential impacts on salmon. *See* Lake Oswego, ESA Exhibits Folder.

Neither the Biological Opinion nor the FEIS address the state variance process for in-water work, and do not specifically or adequately address the increased impacts to wildlife from work during this time of special sensitivity to salmonids. This is a very significant and material omission from both the BiOp and FEIS. Indeed, the DEIS did not disclose that there would or could be a variance from the standard in-ware work window. Instead the DEIS actually suggested that the project would comply with that restriction. See DEIS Ecosystems Tech. Report at 1-10. This abrupt change between the DEIS and FEIS and lack of analysis regarding that change requires a SDEIS.

The Federal Agencies Have Failed to Consider Their Conservation Obligations Under ESA Section 7(a)(1)

The citizens of the Pacific Northwest understand that simply avoiding "jeopardy"-- the immediate extinction of our native salmon and steelhead -- is not a long-term strategy for protecting these important species. The ESA recognizes that reality as well, and, as is noted above, federal agencies have an obligation under 16 U.S.C.§ 1536(a)(1) to also consider and carry out programs for the conservation of listed species. However, apparently the CRC staff and the Federal agencies are not aware of this obligation or do not consider it to be important, because it is completely ignored in the FEIS. The CRC staff and those federal agencies were in fact made aware of alternatives, including alternative bridge designs, that would likely have reduced in-water impacts on threatened salmonids and possibly improved their existing habitat. Those federal agencies were required to at least evaluate such options and include that evaluation in the FEIS. Instead those options were dismissed because of concerns about Cessnas at Pearson Field and the "project schedule." The ESA and NEPA do not allow the Federal Agencies to summarily prefer Cessnas over salmon or to hide behind the project schedule when they have

O-002-036 already taken more than three years to finalize the FEIS.

INDIRECT IMPACTS—INDUCED GROWTH, TRAFFIC PROJECTIONS AND FINANCIAL ANALYSIS

Induced Growth: Metroscope 2010

O-002-037 The most significant addition to the induced growth analysis in the FEIS is the 2010 Metroscope model. Unlike project traffic models, Metroscope does not assume steady growth in Clark County regardless of whether the CRC is built.[172] Rather, it uses commute times and other factors to determine whether additional highway capacity will induce growth in Clark County.[173] Unfortunately, the model relies on problematic assumptions that lead to counterintuitive conclusions. First, the model assumes that Metro's Urban Growth Boundary and Clark County's Urban Growth Area will remain fixed until 2030.[174] For Metro, this is not an appropriate assumption given that the boundary was just expanded by 1,985 acres on October 20, 2011. Moreover, as a 2004 study published in the land use journal Urban Studies indicates, Portland's relatively tighter UGB has historically had a spillover effect into Clark County, where land use regulations have been less rigid, resulting in increased sprawl in that area.[175] Therefore, the assumption of fixed growth boundaries fails to account for historical trends and, as the Metroscope study admits,

> If Metro continues to follow a policy of maintaining a tight Urban Growth Boundary (UGB) and is not successful at accommodating growth through increased levels of

[172] CRC Responses to PEAC DEIS Comments, 54
[173] "Columbia River Crossing MetroScope Results Documentation" (2010), 4. Available at http://www.columbiarivercrossing.org/FileLibrary/TechnicalReports/CRC_Metroscope%20Results_120910.pdf in Indirect Effects Folder.
[174] *Id* at 5.
[175] Myung-Jin Jun, "The Effects of Portland's Urban Growth Boundary on Urban Development Patterns and Commuting." *Urban Studies* (June 2004), 1333-1348.

O-002-037

PEAC's comment regarding a fixed set of land use assumptions is a misinterpretation of the paragraph at the bottom of page 5. Specifically, the statement in the report: "This analysis assumed a fixed set of land use assumptions in both Metro and Clark County reflecting currently adopted plans" does not equate to assuming a fixed UGB through 2030. In fact, part of Metro's adopted plans acknowledge the state requirement to review the UGB every five years and take action to ensure there is a 20-year land supply to accommodate projected demand. As such, the Metroscope model for this analysis assumed a schedule of UGB and UGA expansions to 2030. Further, contrary to the comment, the analysis does account for historical trends in that the UGB assumptions in Oregon are conservative and rely upon more aggressive redevelopment and infill policies as contrasted by a somewhat more expansive UGA assumption in Clark County with less agressive assumptions on redevelopment and infill. Oregon assumptions are based upon Metro plans and policies while Clark County assumptions are based upon Clark County plans and policies.

What the paragraph in the report is attempting to indicate is that other factors besides building the CRC project have an impact on the prospect for induced growth and that this report does not attempt to evaluate those factors. For example, the analysis did not evaluate a conservative set of land use assumptions accompanying the No-Build Alternative in comparison to an aggressive set of land use assumptions (with considerably more UGA expansion in Clark County) in the Build alternative. The land use inputs of UGB/UGA area, vacant land, zoning, etc., are identical between alternatives, including the same UGB/UGA expansion schedule.

PEAC also misinterpreted the narrative in the report on page 14 regarding the 7 residential sites in Clark County and 50 employment sites in Oregon. These were selected to be representative of typical

O-002-037

> redevelopment and infill there would be greater pressure on Clark County and the cities of Clark County to expand their Urban Growth Area (UGA), and there could be significantly more induced household growth in Clark County than reflected in this analysis.[176]

In a 2001 paper written by two Metro analysts who helped develop Metroscope, the dangers of assuming fixed growth boundaries for studies of time-saving highway projects are discussed:

> When financially unconstrained systems are run with the same fixed land use, we generate the mirror image of the simulation of a congested system. Despite decreasing travel times and increasing speeds, commuters travel no further than they did on the congested system; per capita VMT and travel distances remain roughly the same as before. Again implicit transportation price changes up or down appear to have no effect on commuter behavior. In this instance, commuters pocket large amounts of "travel cost savings" though nothing in the model specifies what happens to these consumer surpluses.[177]

Due to Clark County's historical failure to maintain tight growth boundaries and the Metroscope creators' admission that fixed land use assumptions lead to inaccurate results, Metroscope's 2010 model is fundamentally flawed.

The model makes a second questionable assumption when establishing employment and residential locations for purposes of determining likely commute routes and times. The model assumes that all commutes occur between 7 residential locations in Clark County and 50 employment locations in Oregon, without providing adequate justification for the selections.[178] The locations are critical to model accuracy because they dictate the lengths and routes of trips that the model uses to compare impacts of increased capacity and tolling. If a given commute involves more time on I-5, it will experience a greater time savings and therefore an increased

[176] "Columbia River Crossing MetroScope Results Documentation." 5.
[177] Conder, Sonny. "Alternative Futures for Transportation and Land Use – Integrated Models Contrasted with "Trend-Delphi" Methods: The Portland Metro Results" (2001), 7. Available at http://library.oregonmetro.gov/files/altfuturesfortransandlanduse.pdf
[178] "Columbia River Crossing MetroScope Results Documentation." 14.

commutes across the I-5 Bridge to communicate the results of the analysis. The full model runs underlying the report are based upon a travel demand model for the four county area (Clackamas, Clark, Multnomah, and Washington) with trip movement between 1,998 different analysis zones, not just the 7and 50 representative zones described in the report. This accounts for all of the possible trip movements from every analysis zone in the region to every other analysis zone. Allocation of household and employment growth is through a land use allocation model for the five plus county area (Clackamas, Clark, Multnomah, Washington, Columbia and parts of Yamhill and Marion) to a set of zones that aggregates the travel zones to 425 residential zones (census tracts) and 72 employment zones.

PEAC's comment referencing the travel time savings is comparing a single specific travel time from one point to one point against the aggregate travel time difference perceived by all PM peak motorists from all origins to all destinations via either I-5 or I-205. It is the relative accessibility of different parts of the region that impacts growth allocation including the change in access to Clark County from Oregon regardless of which bridge they choose to use. In aggregate, the report documents that most of the accessibility to Clark County is already provided today with the existing I-5 and I-205 bridges.

O-002-037

likelihood of sprawl, whereas a commute that spends less time on I-5 will experience minimal benefit and therefore a lower likelihood of sprawl. Despite their importance to the model's success, the locations' selection was apparently based on merely what the authors considered designated work centers or typical residential locations:

> The Oregon employment locations are transportation analysis zones (TAZ) selected from areas in Oregon designated as Regional Centers, Town Centers, Central City, or regionally significant industrial areas. Clark County residential locations were identified to include the weighted residential centroid of the county and typical residential locations throughout the county.[179]

The lack of detailed justification for the selection of such important model inputs is disconcerting, particularly given that many locations are noticeably distant from the I-5 corridor (Figure 3.1-1), which would tend to underestimate induced growth.

Given that both assumptions mentioned would tend to downplay induced growth potential, the model's pro-CRC outcome is unsurprising. However, the model's bias reveals itself in Figure 3.3-1, which compares the number and duration of northbound commutes between 4 and 6 p.m. for the no-build alternative and the build-with-toll alternative.[180] The latter includes a "toll impedance" factor which adds time to the perceived commute duration in order to reflect the discouraging effect tolls have on driving. According to the model, the average commute length for the no-build alternative is 35.9 minutes and that for the build-with-toll alternative is 34.1 minutes (including toll impedance).[181] The model predicts that despite expanding Columbia River Bridge bottleneck from 6 to 12 lanes, the average commuter during afternoon rush hour would only perceive a time savings of 1.8 minutes.[182] While this conclusion suggests minimal

[179] "Columbia River Crossing MetroScope Results Documentation." 14.
[180] "Columbia River Crossing MetroScope Results Documentation." 26.
[181] "Columbia River Crossing MetroScope Results Documentation." 26.
[182] "Columbia River Crossing MetroScope Results Documentation." 26.

O-002-037

induced growth, it is wholly inconsistent with Figure 7-16 of the FEIS Traffic Technical Report, which indicates a 20 minute savings for the 2 hour P.M. peak trip from I-84 to 179th Street.[183] Applying the 6 minute toll penalty used in the FEIS Indirect Effects Technical Report, a 14 minute perceived time savings is realized.[184] Obviously, not all commutes will obtain the full 14 minute perceived benefit due to varying route selection. However, it is difficult to imagine the average commuter only realizes 1.8 minutes of the benefit, which indicates inherent flaws in the underlying assumptions of the Metroscope model. The FEIS contains large time savings (14 minutes) to justify the project, but minimal time benefits (1.8 minutes) to downplay the likelihood of induced sprawl.

Literature review

O-002-038

Another component of the FEIS induced growth analysis is a literature review of induced growth studies.[185] As in the DEIS, the literature review fails to explain why certain studies were chosen over others and why they apply to the particular facts of the CRC. In the FEIS, the review is distilled into 6 factors that influence induced growth, and each is addressed in Exhibit 2-1 in the FEIS Indirect Effects Technical Report.[186] Nearly every factor oversimplifies the facts of the CRC at the expense of complete evaluation of the project's induced growth impact.

The first two factors pertain to whether the CRC creates new access to underserved areas or areas on the urban edge.[187] The analysis finds that the CRC would not create new access because I-5 has been an interstate corridor since 1958 and the urban edge would not be more accessible because the project is 7 miles from the north edge of the Urban Growth Area. While the project

[183] FEIS Traffic Technical Report, Exhibit 7-16.
[184] FEIS Indirect Effects Technical Report, 2-7.
[185] FEIS Indirect Effects Technical Report, 2-2.
[186] FEIS Indirect Effects Technical Report, 2-2.
[187] FEIS Indirect Effects Technical Report, Exhibit 2-1.

O-002-038

The indirect effects analysis for CRC included an assessment of the project's effects on land use, a survey of academic literature and comparison to its relevant findings, a comparison and analysis of growth management regulations in the region, transportation demand modeling and traffic operations analysis, and advanced transportation-land use modeling. While it is generally acknowledged that transportation facilities can indirectly affect land use patterns, and some types of highway capacity improvements can promote "sprawl", it is also clear from the academic research that the particular characteristics of each project, and the context of each project, are critical to its likely indirect effects. This is summarized in the FEIS (pages 3-116 through 3-119) and further discussed in the Indirect Effects Technical Report. The analysis has been reviewed by an independent panel of experts who unanimously determined the methodology to be valid and reasonable. Additionally, the analysis has been validated by the results of the 2010 Metroscope modeling.

Regarding specific comments raised:

- the project would not provide new access to areas previously unserved or greatly underseverd by highways;
- the project would not provide new access to land on the urban edge;
- the analysis acknowledges that the project would improve travel times compared to No-Build;
- the LPA would reduce fuel costs and auto wear and tear for some drivers, but not enough to offset the increased cost from the toll;
- the analysis acknowledges that there are some real estate markets that support low density development; and,
- the analysis notes that local and regional land use regulations are not ineffective at managing growth (while the Portland area of the region has a longer history with growth management and more stringent controls on development outside the growth boundaries,

O-002-038

may not create *new* access, it does, according to traffic models, significantly increase access to areas all along the I-5 corridor, including access to the edge of the growth boundary. The failure of the analysis to acknowledge and discuss this important fact indicates an incomplete analysis. The next factor is whether the project would substantially improve travel times.[188] Rather than simply answer the straightforward quantitative question, the analysis immediately launches into an explanation of why an improvement in travel time would likely be minimized by an added toll. The analysis is analogous to an interviewee who asks himself a question then provides a non-responsive and evasive answer. The answer is simple: transportation models show that a round trip from 179th to I-84 during peak periods would be reduced from 90 minutes to 62 minutes.[189] That this fact was so abruptly downplayed indicates lack of objectivity persistent throughout the induced growth analysis.

Next, the analysis asks whether the project reduces auto travel costs. As described prematurely under the previous factor, the toll increases costs, making the 28 minute round trip savings feel like a 16 minute perceived savings, which the analysis claims, without further justification, "is not expected to have a significant impact on induced demand." However, while the analysis stresses the dampening effects of tolling, it completely fails to consider cost savings resulting from a shorter, less congested commute, which include improved fuel economy and less vehicle wear and tear. Absent is the question whether some of the 6 minute toll impedance effect would be counteracted by these savings. Ignoring the cost savings associated with a less congested commute is consistent with a theme prevalent throughout the analysis of downplaying factors likely to induce growth.

[188] FEIS Indirect Effects Technical Report, Exhibit 2-1.
[189] FEIS Traffic Technical Report, Exhibit 7-16.

Washington's growth management regulations and practices are clearly among the more effective nationally, which is the context of the academic literature from which these key variables associated with induced sprawl are drawn).

In addition, the academic literature regarding the indirect effects of highway construction on land is just half of the body of literature reviewed. The FEIS also draws from the findings of academic literature regarding the indirect effects of high capacity transit projects on land use.

See also the response to letter P-047-007 (regarding indirect effects analysis) and P-047-010 (regarding academic literature on indirect effects).

O-002-038

The fifth factor considers the impact of local land use regulations and concludes that due to the region's commitment to effective growth management the risk of sprawl is low.[190] As discussed, this assertion flies in the face of Clark County's history of expanding growth areas in response to Metro's relatively firm boundaries.[191]

The final factor looks at whether there are real estate markets supporting low density developments and concludes that while some low density areas exist, they are quite far from the project area and therefore unlikely to contribute to induced growth.[192]

The following comments, on pages 147- 175 regarding financing, traffic modeling and projections, and induced growth are adopted and incorporated from separate comments that Joe Cortright will also be submitting. The documents cited in this section are located in the Indirect Impacts Folder.

CRC project financing is highly uncertain, making it impossible to know what will actually be built and therefore what will be the actual environmental, social and land use impacts.

O-002-039

In order to assess the impacts of the project, you have to know what the project is. It is clear from the record that the scale of the project will be adjusted to fit available financing. But as yet, the project's financing is simply conjectural: none of the sources of funding (federal highway earmarks, FTA transit funding, Oregon and Washington gas tax increases, tolls, and a CTRAN sales tax) have been committed to the project. The Governors have directed that the project be phased, and the CRC has indicated that it is planning to break the project into phases, but as yet, no meaningful action has been taken.

[190] FEIS Traffic Technical Report, Exhibit 7-16.
[191] "The Effects of Portland's Urban Growth Boundary on Urban Development Patterns and Commuting."
[192] FEIS Traffic Technical Report, Exhibit 7-16.

O-002-039

As these comments are copied from Mr. Joe Cortright's submitted comment letter, please see the responses to his letter (P-047).

O-002-039

It is apparent from the staff report that the financial plan for the CRC is completely unresolved at this point. We have no idea what kind of project will actually be built, so we have no way of accurately assessing its impacts.

The CRC depends on a complex, multi-part financing plan. None of the parts of the plan have yet been approved by any of the bodies that must approve such funding. There are four key elements to this financing plan: toll bonds, Oregon and Washington appropriations, federal New Starts funding, and federal highway funding.

The CRC financing plan rests on seven key assumptions about decisions that will be made and amounts that will be provided for project funding:

1. Washington legislative approval of facility tolling.
2. Washington legislative approval of funding for the state share of the project.
3. Oregon legislative approval of funding for the state share of the project.
4. Earmarking or Federal Highway Administration approval of funding for the highway portion of the project.
5. Federal Transit Administration approval of New Starts Funding
6. Oregon and Washington Treasurers' approvals for the authorization of toll-backed revenue bonds
7. Voter approval in the CTRAN district or a portion thereof of operating funds for light rail.

In order to construct the project as currently described by the Project Sponsors Council, all of these financial approvals must be made, and made at the full amount budgeted. If any of these sources of funds or approvals is not made, or if funding is provided at less than the budgeted amount or if funding or approval is delayed, there is no assurance that all of the component parts of the project will be constructed.

O-002-039

There are major risks that one or several of these assumptions are incorrect and that expected sources of funding will not materialize, and additional risks that they will not materialize in the amounts budgeted or on the schedule currently planned.

In addition, it now seems certain that the project will need to be broken into a series of separate phases. The timing and the ultimate scope of the Columbia River Crossing project will depend upon the amount of funds received for project construction. There is no assurance at this time that any given component of the project will be completed.

At the present time, it is highly likely that funding will not be available to construct the entire project as described. Acknowledging this fact, on July 20 of this year, Governor John Kitzhaber directed CRC to develop a "sequencing" plan for the project (Kitzhaber 2011):

> The Treasurer also identified potential replacement revenue strategies, which I appreciate and am willing to explore. But I believe that if we are going to get the CRC done, it is time to start planning for a project that adapts to the available resources and fits into today's economic reality. To that end, I am going to ask the Oregon Department of Transportation and the CRC to prepare a sequencing plan that accommodates anticipated cash flow.
> (Kitzhaber 2011)

The need to sequence or phase the project to fit available funding is likely to result in major changes to the project's scope, timing and ultimate impacts. More than a year ago, the Independent Review Panel appointed by then-Governor Kulongoski and Governor Gregoire concluded that the project would need to be broken into phases because of the low likelihood of all of the projected funding materializing. The IRP recommended the project be broken into

O-002-039

three phases each of 1 to $1.5 billion (Independent Review Panel 2010, page 186). The IRP is particularly significant because the Directors of the Oregon and Washington Department's of Transportation both said that they accepted the report and agreed to implement its findings (Garrett and Hammond 2010). The IRP also recommended that phases be constructed to be independent and self-standing, so that the project would be functional regardless of whether funding for subsequent phases was ever realized.

The IRP warned that there may not enough money to complete the whole project and that it ought to be designed so that it could be built in phases, and that if subsequent funding did not become available—which it specifically identified as a possibility—that the project would be functional.

> There is a possibility that despite best efforts to assemble funding, the Project Sponsors may encounter a significant shortfall in funding to complete all of CRC as currently envisioned. There is also a possibility that a number of current uncertainties in design and schedule will adversely affect the total cost of the project. Projects of this size and scope are often planned and developed assuming a phased construction effort. Phasing (as opposed to staging) refers to the completion of some major portion of a total project, with such completion having meaningful value, yet deferring subsequent construction till later, often uncertain, dates when additional funding can be obtained.
> Independent Review Panel 2010, Page 185

Because the project will be phased or sequenced, and that phasing plan has not even been presented, much less adopted, no one has any assurance as to what portion of the project will actually be built. Because the project consists of a diverse array of components, some of which increase traffic (new bridge lanes, new intersection capacity), and others which reduce or divert it (light rail transit, tolling), not knowing which phases will actually be built means that the FEIS fails to disclose what will be the net environmental, economic and social impacts of this project.

CRC traffic and toll revenue forecasts are inaccurate, meaning traffic and traffic related impacts are not accurately assessed.

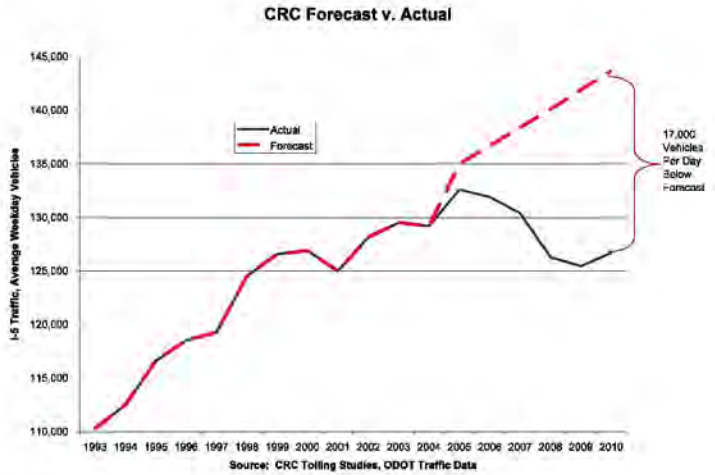
O-002-039

Assessing the environmental, social and land use impacts of the Columbia River Crossing project depends on accurate estimates of future traffic levels. The FEIS purports to offer very detailed estimates of traffic flows across the I-5 bridge and related roadways, through the year 2030.

The traffic and toll revenue forecasts prepared for the Columbia River Crossing are not accurate. The original forecasts were prepared based on 2005 base year data, and were published in 2007, and incorporated in the May 2008, Draft Environmental Impact Statement. The language in the FEIS and DEIS is virtually identical in many cases. The Columbia River Crossing has not produced new forecasts of travel since that time.

Actual traffic data show that CRC traffic projections are wrong. The CRC projections are that traffic on the I-5 bridges should have reached 143,700 vehicles per day in 2010. Actual traffic levels were 126,700 vehicles per day in 2010, 17,000 vehicles per day below the CRC forecast. These figures are based on our analysis of ODOT's data on traffic levels on I-5, through November 2010.

O-002-039



In addition, the question is not merely whether traffic is increasing again now, but whether they will recover to the previous levels, and whether they will grow at anything close to the rate CRC projected in the DEIS. The evidence shows the growth rate is much slower than forecast, raising serious questions about the project's financial viability.

The Treasurer's independent review of the traffic forecasts confirmed the flaws in CRC traffic forecasts. In 2011, the Oregon State Treasurer retained Robert Bain of RB Consult to review the CRC finance plan and traffic projections. Bain concluded that:

- Traffic and revenue analyses prepare for the CRC were unsuitable for credit analysis
- CRC traffic projections were confusing and outdated
- Authors of the traffic projections failed to examine historical data or verify their models against actual trends

O-002-039

- Diversion estimates to I-205 were "worrying."
- Overall, the CRC appears to have overestimated traffic.
- Toll revenue appears to be over-estimated by 25 percent.

(Bain 2011) in Indirect Impacts Folder.

Both ODOT and CRC consultants have concluded that the models used to estimate CRC traffic do not produce valid, accurate estimates of traffic for tolled facilities. In February 2009, the Oregon Department of Transportation received a report prepared by Parsons Brinckerhoff, David Evans and Associates Inc., and Stantec Consulting Services Inc. The authors of this report all happen to be contractors for the Columbia River Crossing project. The report is entitled *Tolling White Paper 3: Travel Demand Model Sufficiency*. This document is available on the Internet at the following address:

http://www.oregon.gov/ODOT/TD/TP/docs/LRPU/twp3.pdf in Indirect Impacts Folder.

ODOT's report finds that the current models used to forecast traffic in Oregon, and specifically in the Portland Metropolitan Area, including the Metro model, are inadequate to accurately predict traffic volumes on tolled facilities, such as the proposed Columbia River Crossing. Consider ODOT's summary of this report:

> Existing models in Oregon are rated as excellent for the purposes they were designed, and some are internationally recognized. However, Oregon models have not been specifically designed to evaluate toll projects, so **planners are not able to confidently forecast travel patterns for projects that are considering tolling/pricing. Existing models are not able to determine how travelers would change their mode, route, travel time, or destination in response to tolling/pricing.**
> Oregon Department of Transportation, Tolling and Travel Demand Model Sufficiency, Highlights of Tolling White Paper 3, March 2009, page 1, http://www.oregon.gov/ODOT/TD/TP/docs/LRPU/Highlight3.pdf#Tolling_White_Paper

O-002-039

_3 in Indirect Impacts Folder.
(Emphasis added)

As the ODOT study shows, the Oregon Department of Transportation and the principal contractors for the Columbia River Crossing concur that the traffic forecasting methods used by the CRC are not accurate or reliable. Accurate estimates of future traffic levels are central to assessing the need for this project, justifying its size, evaluating its environmental impacts, and most crucially, determining the viability of its financial plan.

The recession does not explain the decline in I-5 traffic, and in any case, CRC has not revised its traffic projections or impact analysis to reflect the much slower rate of growth.

It has been claimed that the decline in traffic since 2005 is attributable to the economic recession which began in December 2007. The current staff report alludes to this same argument, claiming that the traffic projections and financial documents need to be "recalibrated to reflect stalled economic growth." (Staff report, PDF page 30). Robert Bain, the consultant to the Oregon State Treasurer conclusively disposed of this argument in his report:

> Traffic volumes using the I-5 Bridge have flattened-off over the last 15-20 years; well before the current recessionary period. This is highlighted by the red dotted trend line in the chart below which was estimated up to and including the year 2006 (i.e. it omits the recent 2007 – 2010 period characterised by fuel price hikes and economic recession). The clear inference is that the flattening-off is a long-term traffic trend; not simply a manifestation of recent circumstances.
> (Bain 2011, page 3) in Indirect Impacts Folder.

And even though CRC financial plans now concede that DEIS projections are wrong, the traffic estimates in the FEIS—which form the basis of the claims about the project's environmental, social, traffic and economic impacts—have not been revised to reflect this new reality—they are essentially the same traffic figures given in the DEIS.

O-002-039

Most of the impact analysis in the FEIS is based, directly or indirectly, on comparisons of traffic levels between the no-build alternative and the proposed project, and these traffic level estimates are drawn from data that has been shown to be wrong, from models that are not even designed forecast traffic for tolled facilities like the CRC, and which have not been updated to reflect the acknowledged changes that have occurred since the DEIS was published. Consequently, the FEIS does not constitute a fair and reasonable analysis or disclosure of the environmental, social, and economic impacts of the CRC.

The FEIS fails to meet US DOT's own requirement that funding be reasonably available in the region's fiscally constrained transportation plan.

O-002-040

U.S. DOT policy requires that US DOT not approve a Final Environmental Impact Statement for any project for which reasonably available funding has not been identified in the region's approved fiscally constrained transportation plan. The US DOT's transportation planning requirements provide:

Table 2. Fiscal Constraint Requirement before Approving the NEPA Decision

Before a Final Environmental Decision (ROD, FONSI, CE) is approved in:	Fiscal Constraint must be demonstrated by:
Metropolitan Areas	• Entire Project is in the MTP • At least one subsequent phase of the Project is in the TIP (more if within TIP timeframe) • Full funding is reasonably available for the completion of the entire Project

Source: U.S. Department of Transportation, Office of Planning, Environment, and Realty, Supplement to January 28, 2008 "Transportation Planning Requirements and Their Relationship to NEPA Process Completion" February 9, 2011

Nearly all of the elements of the financial plan for the CRC are speculative or un-approved.

O-002-040

As these comments are copied from Mr. Joe Cortright's submitted comment letter, please see the responses to his letter (P-047).

O-002-040

A cornerstone of the CRC finance plan is the claim that $400 million will be available from the federal government as a result of an earmark or other discretionary funding, over and above funding that would otherwise come to the region, because of the alleged special character of this project. (The latest version of the plan actually assumes a $500 earmark in some scenarios).

For years, CRC advocates have traded on the idea that the CRC is a special project that will get funding from "a special pot" that wouldn't otherwise be available to the region, and that it wouldn't compete for dollars that could go to other projects, like federal formula funds. For example, earlier this year, Matt Garrett, ODOT director said:

> "Federal highway funds are being sought from a category known as Projects of National Significance. Very few projects in the country and no other projects in the region can compete for these funds . . . . These sources are unique to the CRC project and do not affect other Oregon projects."

Notice in particular three things about Mr. Garrett's statements. First, the passive voice and indefinite form "funds will be sought." Second, Mr. Garrett is silent on what would happen if these discretionary funds either aren't available, or fall short of the amounts being "sought." And third, Mr. Garrett in no way rules out seeking funding for CRC from other sources.

The just released FEIS Financial Plan, however, opens the door to using funding the CRC using federal formula allocations that are available for a wide range of projects in the region and the state. The financial plan tries to downplay the likelihood that these funds will be used.

"Federal Revenue and Financing Options"

Federal Formula Funds

O-002-040

ODOT, WSDOT, C-TRAN, TriMet, Portland's Metro Regional Government (Metro), and the Southwest Washington Regional Transportation Council (RTC) receive transportation funding from a variety of federal formula grant programs. In an urban area, the metropolitan planning organizations (MPOs) program these funds to specific eligible uses. In the Portland-Vancouver region, this is accomplished through Metro's or RTC's Metropolitan Transportation Improvement Program (MTIP) processes. State and federal funds are also programmed in ODOT's and WSDOT's State Transportation Improvement Programs (STIPs). While federal formula funds potentially could be used for the CRC project, many of these funds are currently programmed for other uses, and the finance plan for the CRC project does not anticipate reprogramming of these funds.
(Final Environmental Impact Statement, Finance Plan, Section 4.3.1, page 4-7)

It is clear from this wording that there is no definitive determination of whether any funds are actually available or committed for the CRC. The wording of the FEIS Financial Plan makes it clear that everything about the plan is effectively hypothetical, and will change later.

> As stated earlier, the financial plan scenarios discussed above are illustrative of the financial tradeoffs between the alternatives. The finance plan will be refined during final design, and the final plan may differ from the scenarios discussed above.
> (Final Environmental Impact Statement, Financial Plan, page 4-18)

The current illustrative financial plan scenarios are valid if, and only if, the CRC could obtain a $400 million to $500 million earmark or discretionary allocation. That was always at best just a speculation. Recent developments in Washington DC make it clear that it is a virtual impossibility.

ODOT Director Matt Garrett conceded there was currently no evidence that there would be any such funding available as part of the transportation reauthorization process:

> We thought there might be a specific project of national significance. At least with the language we have right now, the discretionary money is not really clear where that's going to present itself.

O-002-040

Matt Garret, Metro LUFO Hearing August 11, 2011

More recently, Peter DeFazio, a key legislator, whose support is vital to any federal funding, has repeatedly expressed his dismay about the size and cost of the CRC. On August 7, DeFazio told the Associated Press that the outlook for funding for the Columbia River Crossing is now "very, very, very, very grim." (Fought and Cooper 2011).

In the Oregonian on August 14, DeFazio said:

> "I kept on telling the project to keep the costs down, don't build a gold-plated project," a clearly frustrated DeFazio said. "How can you have a $4 billion project? They let the engineers loose, told them to solve all the region's infrastructure problems in one fell swoop... They need to get it all straight and come up with a viable project, a viable financing plan that can withstand a vigorous review."
> (Manning, Jeff. "Columbia River Crossing could be a casualty of the federal budget crunch", The Oregonian, August 14, 2011).

Later, DeFazio told Oregon Public Broadcasting:

> "I said, how can it cost three or four billion bucks to go across the Columbia River? . . . Now with the proposed Republican cuts in transportation . . . they want to cut this [transportation spending] by 35 percent, that means minimally we lose 600,000 to a million jobs and projects like this don't go forward. . . . Right now it's very problematic. . . . The Columbia River Crossing problem was thrown out to engineers, it wasn't overseen: they said solve all the problems in this twelve-mile corridor and they did it in a big engineering way, and not in an appropriate way.
> "Think Out Loud," Oregon Public Broadcasting, August 18, 2011.

Federal transportation funding faces major cutbacks. There are no earmarks or projects of national significance. As a result, CRC's funding strategy is tantamount to "bait and switch": advocates tell everyone that the federal money for the CRC will come from a "special pot" of earmarks that won't compete with other local projects, and but it should be increasingly clear that when this doesn't materialize, they will seek funding from all of the other sources of funds listed in the FEIS.

O-002-040

When they do, this will reduce the amount of money available for other projects in the region. Because the CRC is such a large project with a high risk of cost overruns, and because it faces revenue shortfalls from other funding sources, it would likely be a drain on the region's transportation financing capacity the next decade. Indeed, the recently released project schedule—which does not include phasing—extends the construction period to 2023. No one in the region has identified, approved, or committed funds for the construction of the CRC. Therefore, to move forward with this project would be a violation of US DOT's own policy requiring that the reasonable availability of funds for a project in a fiscally constrained plan be in place prior to approving the FEIS.

Historical data show that traffic levels on I-5 are declining, and prove that FEIS traffic estimates are inaccurate.

O-002-041

The levels of traffic crossing the I-5 and I-205 bridges are the central issue raised by this FEIS. The need for the project is predicated on the claim that traffic levels are steadily increasing, and that additional capacity is needed. The Environmental Impact Statement's claims hinge on a comparison of predicted future traffic levels with, and without the bridge.

Even though traffic is at the heart of the need for this project, and is central to evaluating and disclosing its environmental impacts, the FEIS contains a paucity of actual data on traffic levels. The baseline traffic levels reported in the FEIS are purported to represent 2005 "base year" conditions.

O-002-041

As these comments are copied from Mr. Joe Cortright's submitted comment letter, please see the responses to his letter (P-047).

O-002-041 The FEIS contains no actual data on current traffic levels over the I-5 bridges. The most recent data are from 2005.

According to the FEIS, the levels of reported traffic in 2005 was 134,000 vehicles per day. That figure is, in fact, not accurate. According to ODOT's published data, traffic in 2005 was 132,600 vehicles per day. If the FEIS does not even contain correct data about so-called "base year" traffic six years ago, how can anyone put any faith in the project's projections of traffic levels two decades hence?

We are a significant way (more than 20 percent) through the forecast period, and the FEIS contains no information that would enable one to validate the estimates contained in traffic projections. Actual data on traffic levels over the I-5 and I-205 bridges between 2005 and 2011 are omitted from the FEIS. The FEIS actually contains no historical time series data on traffic levels.

The CRC predicts sustained rapid growth in the no-build scenario, but has done nothing to validate its predictions, even though we have six years of actual experience since the base year of their projections. The base year for the forecasts of future traffic for the Columbia River Crossing is 2005, with a stated level of 134,000 vehicles per day. The CRC forecasts that traffic in the no-build scenario on the I-5 bridges will be 184,000 vehicles per day in 2030.

O-002-041

We now have nearly six years of experience—more 20 percent of the planning period--since the base year of the CRC traffic forecasts. CRC has done nothing to test whether their estimates have been borne out by actual experience.

The Oregon and Washington Departments of Transportation collect data that track the average level of traffic volumes on I-5 across the Columbia River. These data are reported by the Southwest Washington Regional Transportation Council. Data are from the council website: http://www.rtc.wa.gov/data/traffic/brdgawd.asp "Columbia River Bridges." The following table shows average annual traffic over the I-5 Columbia River Bridges for the past 15 years. It also displays the annual growth rate of traffic each year, compared to the preceding year, and the average annual growth rate for three five-year periods.

Average Daily Traffic, I-5 Bridges.

Year	Average Daily Traffic	Annual Growth Rate
1994	112,988	
1995	116,589	3.2%
1996	118,558	1.7%
1997	120,644	1.8%
1998	124,516	3.2%
1999	126,589	1.7%
2000	126,903	0.2%
2001	125,652	-1.0%
2002	128,162	2.0%
2003	129,657	1.2%
2004	130,279	0.5%
2005	132,603	1.8%
2006	131,916	-0.5%
2007	130,389	-1.2%
2008	126,278	-3.2%
2009	125,436	-0.7%

O-002-041

Annual Average Growth (Five-year Periods)	
1994-1999	2.3%
1999-2004	0.6%
2004-2009	-0.8%

This data shows several key trends. First, for the past four years, average traffic levels on the I-5 bridges have been declining, not increasing. Second, the growth rate in traffic on the I-5 bridges has been decelerating for the entire period shown in this table. Growth rates averaged 2.3 percent per year during the late 1990s, only 0.6 percent per year in the next five year period through 2004, and traffic decreased at an average rate of 0.8 percent per year for the past five years. Third, the slowdown in traffic growth rates and the annual decline in traffic clearly preceded the recession that began in December 2007.

It is apparent that the baseline forecast for growth of I-5 traffic included in the Final Environmental Impact Statement assumed a very dramatic acceleration in traffic growth from historical trends. To grow from a 2005 level estimated at 134,000 to a projected 2030 level of 184,000 in the FEIS base case, I-5 traffic would need to increase 1.3 percent per year over the 25-year period, 2005 to 2030. That would require more than doubling the rate of growth actually observed in the 1999-2004 period (0.6 percent). And as illustrated above, the historical data show that the rate of traffic increase has been decelerating (and now declining) and not increasing, as forecast in the FEIS. The FEIS and the traffic projections offer no explanation as to why the rate of increase of traffic should more than double from this long term trend.

Figure 1 shows the actual level of traffic reported by the Regional Planning Council (from the table above), and the forecast level of traffic growth required to achieve the 2030 projection of 184,000 vehicles per day. The actual level of traffic recorded in 2009 was roughly 14,000

O-002-041

vehicles less than the more than 140,000 vehicles per day implied by the CRC traffic forecasts. Whereas the CRC forecast implied that traffic over the I-5 bridges (in the no build scenario) would increase by almost 7,000 vehicles per day; in reality, the number of vehicles crossing the bridge declined by 7,000.

Figure 1: I-5 Bridge Traffic: Actual v. Predicted

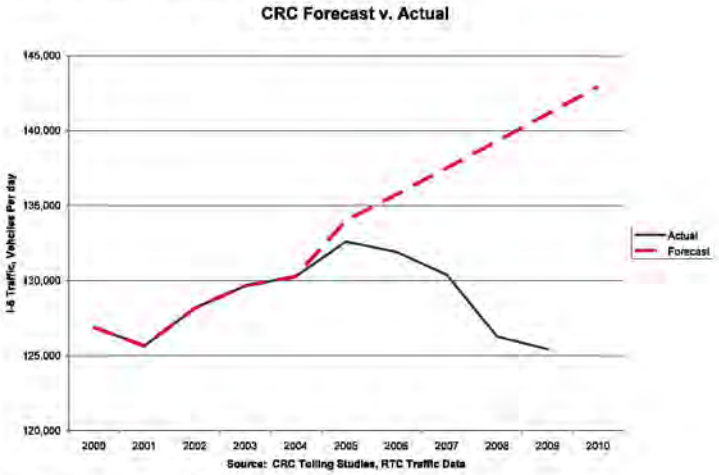
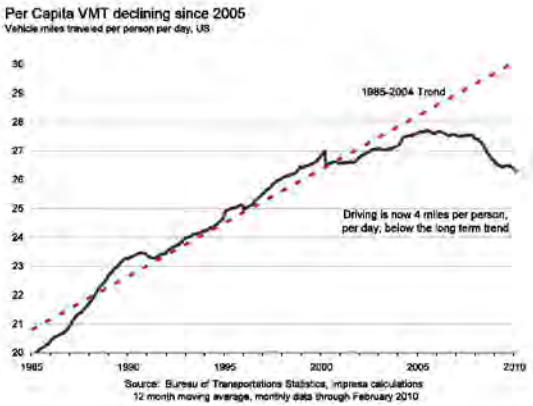


Figure 2: National Trends in Vehicle Miles Traveled

O-002-041



As Figure 2 makes clear, travel demand estimates based on pre-2005 trends are very likely to overestimate travel demand growth. Following the big increase in gas prices after 2004, American citizens began driving less. That trend has persisted over the past five years.

It might be argued that the past four years of declining traffic are a temporary aberration, and that in the longer term, forecast growth will make up for these declines. This is unlikely to be true for three reasons. First, as noted above, the trend has been for a decelerating rate of growth over the past 15 years. Second, as discussed below, changes in gas prices and consumer behavior that are very long term in nature are behind the decline in CRC traffic. And third, the departure from forecast experienced so far means it is likely impossible to make up the shortfall over the remaining time in the forecast period. In order to reach the expected No-Build 2030 traffic volumes of 184,000 from the actual 2009 level of traffic, traffic would have to increase by 1.85 percent per year for each of the next 20 years. That is a growth rate about forty percent faster

O-002-041

than the 1.30 percent forecast in the DEIS, and two and a half times faster than the 0.7 percent growth rate actually observed over the fifteen year period 1994 to 2009. The CRC project materials provide no basis for believing such a dramatic increase in driving will occur.

The tendency to overestimate future traffic levels in mature travel corridors is also apparently an endemic problem with the current methodology used to predict future transportation demand. After a careful review of the literature, the Government Accountability Office found:

> . . . current travel demand models tend to predict unreasonably bad conditions in the absence of a proposed highway or transit investment. Travel forecasting, as previously discussed, does not contend well with land-use changes or effects on nearby roads or other transportation alternatives that result from transportation improvements or growing congestion. Before conditions get as bad as they are forecasted, people make other changes, such as residence or employment changes to avoid the excessive travel costs. (Government Accountability Office, 2005)

The weakness of transportation models in accurately predicting future traffic levels is a continuing problem. So it is not merely the CRC traffic projection model that is problematic; rather the entire class of four-step (trip generation, assignment, mode, routing models) have proved inaccurate in practice. After an exhaustive review of the state of the art, the Transportation Research Board of the National Academies wrote:

> "In 2005, as has been true for the past four decades, these models could not provide accurate information to inform decision making on many transportation and land use policies or traffic operation projects."
> (Committee for Determination of the State of the Practice in Metropolitan Area Travel Forecasting, 2007)

While technology has allowed for faster computation, and more detailed mapping, they conclude:

O-002-041

> "The practice of metropolitan travel forecasting has been resistant to fundamental change. Every 10 years or so there begins a cycle of research, innovation, resolve to put innovation into practice, and eventual failure to affect any appreciable change in how travel forecasting is practiced."
> (Committee for Determination of the State of the Practice in Metropolitan Area Travel Forecasting, 2007) pages 123-124.

An "Investment-grade traffic forecast" would show substantially different traffic and pollution effects.

CRC has not prepared an investment-grade forecast. Investment grade forecasts use more realistic assumptions about travel behavior on tolled facilities. While in public statements, CRC officials have claimed that the investment grade forecast is a mere "refinement" of the forecasts contained in the FEIS, that is untrue. The investment grade forecasts show that traffic may be much more sensitive to tolls that allowed for in the FEIS models. For example, the Investment Grade Forecast prepared for the Washington State Department of Transportation showed that traffic levels on the 520 Floating Bridge would fall by almost half when tolls were introduced, because drivers would shift to the parallel and un-tolled I-90 bridge. (Wilbur Smith & Associates, Wilbur Smith Associates, "SR 520 Bridge Investment Grade Traffic and Revenue Study," Washington State Department of Transportation, August 29, 2011, http://www.wsdot.wa.gov/ NR/rdonlyres/A3B026EC-C9AF-4B43-BA31-4CB30FFD2CEB/0/SR520InvestmentGradeStudy. pdf,) in Indirect Impacts Folder.

The situation is nearly identical for the Columbia River Crossing. While the I-5 bridge is proposed to be tolled, the parallel I-205 bridge is not. Consequently, more traffic may be diverted from I-5 to I-205, producing much higher levels of congestion than estimated in the FEIS. The failure to accurately estimate traffic effects means that the FEIS does not comply

O-002-041

with NEPA because it doesn't reveal what the actual patterns of traffic will be under the LPA. CRC should be required to disclose the actual patterns of traffic than can be expected by undertaking an "investment grade" analysis prior as part of the NEPA review.

Metroscope estimates of induced demand effects are implausible and contradict FEIS travel estimates.

The FEIS relies for validation of its minimal impacts on land use on the Metro "Metroscope" model. The results of the Metroscope model are not plausible, and are not consistent with the literature on induced demand. The Metroscope forecast predicts that the existing 6 travel lanes on the I-5 bridge would accommodate 18,067 trips in the afternoon peak in 2030 under the No-Build alternative. In contrast, the LPA is predicted without tolls--with 10 lanes of traffic—is predicted would accommodate just 18,643 trips in the two hours of the afternoon peak in 2030. There is no reasonable basis for estimating that a 66% increase in capacity (3 lanes to 5 lanes) would produce only a 3% increase in traffic over the next decade compared to the no-build.

The Metroscope model is based in part on the Metro transportation forecasting model, which the Oregon Department of Transportation and CRC consultants have determined are not capable of accurately predicting traffic on tolled facilities.

In addition, there is no evidence that the Metroscope models are consistent with, or support the traffic forecasts contained in the FEIS. The FEIS claims that automobile traffic during the PM peak hour would be 33% higher under the LPA than under the No-build (FEIS, Summary, Exhibit 18). The Metroscope model claims that automobile traffic during the PM peak hour

O-002-041

would be 10% lower under the LPA than under the No-Build (Metroscope, Figure 3.3-1 2030 PM 2-Hour Travel Time Histograms by Alternative, page 25). Far from confirming the findings of the FEIS, the Metroscope model contradicts them. With plainly contradictory evidence that is unexplained by the FEIS, no one can reasonably assume that the FEIS accurately characterizes the environmental impacts of the LPA.

Projections grossly over-estimate base case traffic, and under-estimate induced demand, thereby biasing estimates and concealing the project's true environment impacts.

It is evident that the FEIS creates a fictitiously high level of predicted no-build traffic for two reasons. First, this creates a justification for the project. Second, it enables the project to claim that the traffic volumes created by the LPA will be less than the artificially inflated "no-build" scenario, and will therefore have fewer impacts.

Models fail to adjust for changing gasoline prices and dramatic shift in traffic trends.

The modeling for the CRC is based on 1994 vintage regional transportation surveys, and implicitly assumes that gasoline prices will be low and stable. It does not reflect the tripling of gasoline prices in the past decade or their effects on travel behavior, mode choice, and land use development patterns.

CRC traffic forecasts appear to be badly out of date, and there is no evidence that they have been adjusted to deal with current gasoline prices or development trends. The CRC traffic forecasts are poorly documented, and don't indicate what baseline data were used, what assumptions were

O-002-041

made, and what error and uncertainty factors are associated with these estimates. It appears from the documents included in the Draft Environmental Impact Statement that traffic projections were made in 2007, based on 2005 data. The key measures of traffic activity (184,000 crossings of the I-5 bridge in the no-build, and 178,000 in the build alternatives), have remained essentially unchanged for several years. (See for example, Draft Environmental Impact Statement, Summary, Exhibit 26 Summary of Transportation Effects and Cost for Each Alternative, Page S-30). The forecast documents, including those released in 2010, use the same numbers (184,000 in the no-build, and 181,000 for the LPA) as the project has publicly quoted since the DEIS was released in 2008. The forecast documents refer to the "current year" for traffic purposes as "2005." The modeling was based on Metro's transportation model (Columbia River Crossing, 2010f). The Metro model was calibrated based on behavioral data collected in 1994 and assumes that real gasoline prices would not increase at all, i.e. that gasoline prices increase no faster than the rate of inflation (Higgins, 2008) in Indirect Impacts Folder.

There is clear evidence that the persistently much higher level of gas prices since 2005 has produced a sea change in consumer behavior. Nationally, per capita driving has been in decline since 2004, and is now at 1999 levels.

Consumers are not only driving less, but are scrapping cars faster than they are buying new ones. Nationally, the number of vehicles in operation declined by four million in 2009 (Brown, 2010). In Oregon, vehicle registrations have declined by 30,000 compared to the previous year (Har, 2010).

O-002-041

The rise in gasoline prices and a growing interest in alternatives to car-dependent living has triggered a shift in housing markets within metropolitan areas. The biggest price decreases in housing and the highest foreclosure and default rates have been recorded in outlying suburban locations (Cortright, 2008) in Indirect Impacts Folder..

The CRC's transportation model is based on observations made in 2005, and assumes the consumers will continue to behave as they did in 1994 (when gasoline cost $1.10 gallon). As a result CRC predicts the rate of increase of vehicle travel will be double that of the previous decade. This is highly suspect in a world where gasoline prices have more than doubled, where driving is in decline, and consumer behavior patterns are obviously changing.

A wealth of evidence shows that car ownership is declining, the number of young drivers is declining, that vehicle miles traveled are declining, and that gasoline sales are declining, both nationally and in Oregon and Washington. The FEIS contains no analysis of these trends. See for example articles by Williams-Derry, 2011 in Indirect Impacts Folder.

FEIS claims about induced demand are incorrect and the FEIS summary of induced demand literature distorts the professional consensus.

O-002-042

The FEIS misrepresents the academic literature on induced demand and distorts the findings of its own literature review.

The FEIS report on Indirect Effects (Appendix A, page A-1) reports that the predecessor of the CRC commissioned Parsons Brinckerhoff to conduct a literature review of 75 studies of the effect of transportation facilities on demand. While the text of the report purports to summarize

O-002-042

As these comments are copied from Mr. Joe Cortright's submitted comment letter, please see the responses to his letter (P-047).

O-002-042

the findings of the report, the FEIS neither includes quotations from the actual report or the report itself. I obtained a copy of the report. Among its conclusions:

> 1.5. Households reinvest travel time savings in longer trips and more travel.
> Household location choice is influenced by many factors including: housing costs, access to jobs, access to goods and services, type of community, amenities/quality of life, public services/schools and property tax rates. The more numerous non-work trips for personal, family, civic, education, and recreation, may prove to be equally as significant as the work trip in housing location choice, especially for multiple worker households. Evidence suggests that households do not locate so as to minimize their travel distance from work; rather, they tend to keep their overall travel time within a certain amount, Despite differences in travel conditions and opportunities across US cities over the past 20-year, people spend the same amount of time per day, on average, in travel. The stability in commuting travel times suggests that transport accessibility improvements will allow households to locate further away from jobs, and that that any travel time savings may be used for more travel. (In the Vancouver-Portland region it may lead to household locations in outlying cities, rather than in the "rural sprawl" that typifies most other metropolitan areas.) The development shift to the suburbs in the past few decades initially reduced commute travel times as housing and jobs co-located along previously uncongested freeways. However, the increased traffic congestion of suburban areas has led to larger increases of late in suburban commute times.
> Parsons Brinckerhoff, Land Use-Transportation Literature Review For the I-5 Trade Corridor Regional Land Use Committee, September 17, 2001, page 12

The latest literature on induced demand—which is not addressed in the FEIS or DEIS—takes the very strong view that additional transportation capacity directly induces additional travel. One paper published by the National Bureau of Economic Research, elevates the proposition to a "fundamental law"—finding that for interstate highways in metropolitan areas distances traveled increase one for one with interstate highway lane miles. (Duranton & Turner, The Fundamental Law of Road Congestion: Evidence from US Cities, National Bureau of Economic Research, 2009, No. 15376).

Moreover, the FEIS too narrowly defines induced demand to be demand resulting from changes in land use patterns due to changes in accessibility. This is only one of several sources of

O-002-042

induced, or generated demand. Additional transportation system capacity can cause more and longer trips even without changes in land use patterns. See for example Litman:

> Traffic congestion tends to maintain equilibrium. Congestion reaches a point at which it constrains further growth in peak-period trips. If road capacity increases, the number of peak-period trips also increases until congestion again limits further traffic growth. The additional travel is called "generated traffic." Generated traffic consists of diverted traffic (trips shifted in time, route and destination), and induced vehicle travel (shifts from other modes, longer trips and new vehicle trips). Research indicates that generated traffic often fills a significant portion of capacity added to congested urban road.
> Litman, Todd, Generated Traffic and Induced Travel, Implications for Transport Planning, Victoria Transport Policy Institute, 8 June 2011, in Indirect Impacts Folder.

O-002-043

The results of regional travel demand models were manually adjusted by CRC advocates to shift additional traffic to I-5.

The models used to predict traffic are purported in the FEIS to be robust, verifiable, and scientific. But in fact, the Metro travel model is a black box, with the key factors driving predicted outcomes not accessible to outside scrutiny. In addition, the CRC officials concede having manually adjusted the outputs of the model to produce different results.

While the CRC traffic forecasts based their initial estimates on the regional transportation model, they adjusted these estimates to shift some forecast traffic from I-205 to I-5. The authors of the study labeled this manual adjustment "post-processing"—but it simply means that they used their own judgment to select higher values for I-5 than those produced by the regional transportation model. The reasonableness of this adjustment is debatable. The CRC claims that an analysis of 2005 actual traffic data shows that actual traffic on I-5 was underestimated, relative to I-205 by the regional model. The authors made no apparent attempt to see if their adjustment was supported by data in any subsequent year. But each year after 2005, traffic volumes have been

O-002-043

As these comments are copied from Mr. Joe Cortright's submitted comment letter, please see the responses to his letter (P-047).

O-002-043

proportionately higher on I-205 than I-5, undercutting the stated basis for this "post-processing" adjustment.

According to the report, the effect of the "post-processing" adjustment was to increase traffic volumes assigned to the I-5 bridges by 6 percent over the levels predicted by the regional transportation model without this modification.

The report concedes:

> However, the post processing methodology forecasts less traffic diversion from I-5 to I-205; forecasted 2030 average weekday volumes on the I-5 Bridge are about 6 percent higher with the post-processing methodology than with the regional travel demand models.
> (Columbia River Crossing, 2010b).

The effect of this adjustment is to understate the amount of diversion that will occur to I-205, even with the relatively high value of time estimates used in the travel demand model.

Despite its technical sounding name "post-processing" really represents a judgment on the part of the CRC to disregard the outputs of the Metro travel demand model, and to manually choose the values for traffic.

CRC has failed to disclose visual impacts.

O-002-044

The Columbia River Crossing will have an enormous impact on the views from downtown Vancouver and on Hayden Island. The project will cross the river approximately 70 to 80 feet in the air, and touch down up to a quarter mile away. Almost nothing in the Final Environmental

O-002-044

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O-002-044

Impact Statement reveals how this massive structure will affect the views and light of human beings standing on the ground anywhere near the structure.

The project's visual impact technical report contains only a handful of computer simulated images of the bridge. All of them are taken from distant points floating in the air (where no human being will ever actually perceive the structure). For example, Figure 4.8 shows the bridge from a point somewhere along Hayden Island riverfront, several hundred feet east of the bridge, using a "wide angle" perspective that diminishes the perceived height of the structure." Figure 4-12 shows the bridge from a point hovering several hundred feet above downtown Vancouver. Figure 4-13 shows a portion of the structure relatively close up, but again, from the perspective of someone floating somewhere in the air, and not on the ground. Figure 4-13 also depicts the now discarded open-web design, rather than the truss currently proposed.

The decision to present such a limited and artificial set of perspectives represents a conscious attempt on the part of the sponsoring agencies to conceal the project's visual impacts. It is a decades-old gambit: Robert Moses used the same scheme to try to sell the Brooklyn-Battery Bridge in the 1930s. He concealed the fact that the bridge would have obliterated views from the ground (and lower ten stories of buildings) in Lower Manhattan, by showing the bridge as it might be viewed, in the words of Robert Caro "by a high flying and myopic pigeon." (Caro, Robert. 1976. The Power Broker. Page 464) in Indirect Impacts Folder.

Under NEPA, the sponsoring agencies have an affirmative responsibility to disclose the impacts the project will have on the environment, including the viewshed. The presented FEIS not only

O-002-044

fails to do so, but presents evidence that conceals and distorts the bridge's visual impacts. As such, the FEIS fails to comply with NEPA, and the agencies should be directed to present a fair and accurate set of renderings disclosing the visual impact as it will be perceived by humans standing on the ground near the structure.

Despite making major changes to the project, the CRC did not undertake a supplemental environmental impact statement, as required by NEPA.

O-002-045

The FEIS claims:

Both agencies concluded from these determinations that these changes and new information would not result in any new significant environmental impacts that were not previously considered in the DEIS. These changes in impacts are described in Appendix O of this FEIS. (FEIS, page 2-86.)

The implication is that the standard is "new significant environmental impacts." But this is not the standard that triggers the need for a supplemental environmental impact statement. The standard is whether there are significant changes to the project.

The project is changed is several ways: The footprint on Hayden Island is significantly different. An arterial bridge is being built to Hayden Island. The bridge will be a composite truss, not an open-web. The number of lanes on the bridge will be different. AT least one of the garages in downtown Vancouver is proposed to be built partially underground, and not entirely above ground as in the DEIS. The size of the Clark College park and ride lot has been more than doubled. The new stacked design will have substantial adverse impacts on the bridge's highly touted bicycle and pedestrian facilities which are now reduced in size and relegated to the lower level of the stacked bridge. Moreover, because the project is likely to be phased, and there is no

O-002-045

As these comments are copied from Mr. Joe Cortright's submitted comment letter, please see the responses to his letter (P-047).

O-002-045

certainty as to which phases will actually ever be completed, the project as completed may be very different than the one described in the FEIS, with different environmental impacts.

CRC proponents have implied that the full build FEIS represents the envelope of maximum impacts, and that any smaller project would have lesser impacts, but that is not correct. Some aspects of the project have environmental benefits (tolling, transit), and others have negative environmental effects. Implementing just a portion of the project would likely divert traffic to different locations, with different effects. Prior to issuing a record of decision, DOT should prepare an FEIS that reflects the actual project proposed to be built, and not one that may include many components or features that may never be constructed.

The sponsoring agencies cannot know whether there are "significant impacts" from these changes without undertaking a supplemental environmental impact statement. Moreover, the objectives of NEPA—giving the public the opportunity to review and comment on this analysis of impacts—is thwarted if the sponsoring agency is allowed to make substantial changes to a project after the DEIS.

Conclusion

O-002-046

The CRC's LPA and FEIS are living proof that dinosaurs, at least transportation dinosaurs, are not extinct. Under NEPA, and the ESA, the citizens of Oregon and Washington are entitled to an FEIS that actually considers transportation options other than expanding highway capacity and that fully and objectively evaluates all of the adverse impacts, including in particular the impacts on threatened salmon, of the CRC's highway expansion proposals. The FEIS actually issued by the CRC and approved by the Federal agencies does neither of those

O-002-046

The FEIS and related documents, as well as the process of involvement, coordination and consultation, satisfy the requirements of NEPA and other environmental regulations for the proposed CRC project. Please see the findings in the Record of Decision, as well as responses to comments above.

O-002-046

things. For all the reasons set forth above, PEAC respectfully requests, on behalf of its clients listed below, that the responsible federal agencies and the CRC Task Force withdraw the CRC FEIS and issue a corrected Supplemental DEIS for public comment.

Respectfully submitted,

/s/Tom Buchele

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Dated: October 24, 2011

HAYDEN ISLAND LIVABILITY PROJECT

October 23, 2011

Columbia River Crossing
c/o Heather Wills
700 Washington Street, Suite 300
Vancouver, WA 98660

O-003-001 The following comments are submitting on behalf of the Hayden Island Livability Project in response to the Final Environmental Impact Statement for the Columbia River Crossing Project.

I. INTRODUCTION

The Hayden Island Livability Project (HILP) is an organization comprised primarily of residents from the Hayden Island Manufactured Home Community (HIMHC), a majority of who are elderly and low-income with increased rates of health concerns. Broadly speaking, HILP objects to the adequacy of the Final Environmental Impact Statement (FEIS) in that it fails to analyze and address the disparate impacts the project will have on the community, including but not limited to increased cumulative air toxics, decreased access to vital community resources and amenities, increased health risks and diminished quality of life. The methodology used by the Columbia River Crossing agency in determining the demographic characteristic of the community is invalid and masks the true nature of the community as significantly low-income relative to the City and County median household income. The FEIS fails to identify environmental justice impacts and fails to address appropriate mitigation of these impacts.

II. EXECUTIVE SUMMARY

A. Proximity of Staging Area

The FEIS is insufficient because there has not been a decision on the staging area location. The impacts to the HIMHC will be severe if the Thunderbird Hotel is chosen as the staging ground, yet the FEIS does not analyze these impacts. The Thunderbird Hotel likely contains asbestos, lead and other toxins and is on the community's fenceline, and the staging area activities will emit substantial air toxics and dust.

B. Loss of Safeway Grocery

The Safeway grocery store is the island's only source of fresh food and prescription medication. Many community residents are elderly with limited mobility, and rely on the Safeway for their basic food and medicinal needs. The analysis of the impact to the community due to the loss of Safeway is inadequate, as is the analysis of the alternatives and mitigation options.

O-003-001

Thank you for submitting comments. Specific responses to your comments are provided below.

C. Bridge Access and Utilities Interruption

O-003-001

The FEIS fails to sufficiently address impacts caused by diminished access for island residents and emergency vehicles on and off of the island, as well as disruption of vital utilities due to construction of the bridge and the Hayden Island interchange. CRC must commit to constructing the local access bridge first to ensure continued access on and off of the island.

D. Air Quality

The FEIS fails to consider baseline or existing levels of air toxics and therefore insufficient in its analysis of cumulative (and) health impacts as a result of increased air pollution, both due to construction and increased traffic. NEPA requires hot-spot testing and analysis for a construction project lasting longer than five years that could result in increased carbon monoxide and particulate matter emissions, and environmental justice requires identification and analysis of alternatives and mitigation measures.

E. Noise/ Vibration

Assuming the staging site is going to be at the Thunderbird Hotel, the FEIS fails to analyze the impacts due to noise and vibration stemming from the construction staging ground site, as well as the cumulative noise and vibration impacts in the surrounding community.

F. Hazardous Material

Assuming the staging site is going to be at the Thunderbird Hotel, the FEIS fails to analyze the impacts due to hazardous materials, namely asbestos and lead stemming from demolition.

G. Environmental Justice

The FEIS failed to use appropriate methodology to determine the median household income of the block groups comprising the Hayden Island Manufactured Home Community. The use of Census tract demographics for Hayden Island masks the true low-income characteristic of the 1,300 HIMHC residents, comprising two-thirds of the island's population. CRC was inconsistent in its methodology by relying on Census block group data for Vancouver and North Portland communities. CRC also failed to compare median household income to regional income data. The use of the federal poverty line is inadequate to determine whether potentially impacted communities are low-income environmental justice communities pursuant to Executive Order 12898 and the FTA's Draft Circular on Environmental Justice. HIMHC residents were also precluded from meaningful participation in the development process in violation of NEPA.

H. Project Scoping and Alternatives Analysis

Although the CRC project is a regional transportation project, he FEIS fails to adequately analyze regional impacts, particularly considering the I-205 freeway crossing that is at maximum capacity and the potential alternatives including enhanced railroad or third crossings that would avoid, reduce or mitigate impacts to the HIMHC.

III. SPECIFIC COMMENTS

A. PROXIMITY OF STAGING AREA

O-003-002

- The FEIS is insufficient because a staging area for construction has not been identified, therefore precluding analysis of the impacts due to the staging area.
- The FEIS fails to identify how long the staging area will be in operation, therefore avoiding the requirement to conduct a carbon monoxide and particulate matter analysis.

B. LOSS OF SAFEWAY GROCERY

O-003-003

- The Safeway grocery is the only store on the island serving fresh food and prescription medication. Of the approximate 1,300 HIMHC residents, approximately two-thirds are over the age of 65, and approximately one-third cannot drive. Many of the elderly residents have limited mobility and require mobility assistance devices. The FEIS identifies and acknowledges that residents living near the Safeway who have limited mobility or disabilities will be impacted by the loss of the Safeway, but fails to analyze the specific disproportionate impacts to the health and well-being of HIMHC residents.
- The FEIS fails to adequately analyze alternatives to avoid or mitigate the impacts due to the loss of the Safeway. The FEIS lists four alternative groceries, none of which are accessible without vehicle use, and it fails to analyze the specific disproportionate impacts to the elderly HIMHC residents with limited mobility or disabilities. These residents will not be able to access the alternatives listed in the FEIS.
  - Cash in Carry: primarily for restaurants and only sells in bulk
  - Fred Meyer (Vancouver): 4 miles away, residents will likely have to pay toll
  - Fred Meyer (Kenton): 4 miles away, residents must use light-rail and carry groceries
  - New Seasons (North Portland): 3.6 miles away, too expensive for HIMHC residents
  - Home delivery: too expensive for HIMHC residents, requires internet access, credit
- The FEIS incorrectly states that the project will not affect a resource of importance to a low-income population (Section 3.5, Question 2). A majority of the HIMHC residents are low-income, and have voiced their concern over losing the Safeway store to CRC for more than two years. CRC failed to analyze the community's reliance and dependency on the Safeway store as a critical resource providing access to fresh food and prescription medication necessary for their health and well-being.
- The FEIS incorrectly states that the project would not have disproportionately high and adverse impacts on a low-income population relative to more affluent populations (Section 3.5, Question 4). A basic review of the demographics of Hayden Island shows that the HIMHC residents comprise two-thirds of the total island population and that a majority of HIMHC residents are low-income while many of the residents living east of

O-003-002

There are five possible staging areas identified in the FEIS. Please refer to Section 2.3.3 for more detail about these areas. These staging areas could be used by a contractor, or they may choose their own. It is typical during the planning and NEPA environmental impact assessment stage to identify likely staging areas. The project has done so, assessed potential impacts in and near these areas, and has sought to balance many criteria in this selection process, including minimization of impacts to adjacent neighborhoods.

A contractor will determine the exact activities that will occur on any of these sites, or any other site to be used for staging or casting. The contractor, working closely with the DOTs, will evaluate impacts and apply appropriate mitigations, in compliance with applicable federal, state and local regulations. It has been thought that activities at any one staging area would occur for less than five years, for which no CO, PM10, and PM2.5 hot-spot analyses would be required. The project will work closely with contractors to determine a use plan for each area. If any site is to be used for more than five years, there will be a hot-spot analysis completed.

O-003-003

The project has attempted to avoid the displacement of any businesses, though it is not always possible. The project will continue to look for ways in which impacts can be avoided and minimized. The displacement of Safeway is documented in the FEIS (sections 3.3.3, 3.4.3 and in numerous places in 3.5). Mitigation for this impact is governed by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. The project will suggest that Safeway relocate on Hayden Island, but cannot require them to relocate in any specific location. The eventual relocation will be a business decision by Safeway. We have been informed that there will be a Target grocery store and pharmacy as part of the redevelopment plan for the Jantzen Beach Super Center. We

O-003-003

the bridge project are more affluent. The project will disproportionately impact the majority of low-income HIMHC residents, who cannot take advantage of alternative groceries or pharmacies off the island to the same degree of the more affluent residents east of the bridge project, who have greater mobility and transportation access.

C. BRIDGE ACCESS & UTILITIES INTERRUPTION

O-003-004

- HIMHC has a high percentage of elderly and disabled residents and residents with poor health, thus necessitating unmitigated access to emergency medical vehicles. Any delay in the arrival or departure of emergency medical service could result in permanent injury or death. The I-5 freeway interchange on Hayden Island is currently the only on/off access to the island. The FEIS acknowledges that the project will result in temporary closure of interchange ramps due to demolition and construction. Even if only one directional ramp is closed at a time, the additional time needed to go north into Vancouver and turn around could be the difference between life and death.

- Option A (the Locally Preferred Alternative), contains a local access bridge that would provide alternative access for residents and emergency medical vehicles. Option B does not contain this local bridge, and the FEIS fails to analyze the impacts to HIMHC residents.

- The FEIS fails to identify phased construction alternatives as mitigation for the disproportionate impacts borne by HIMHC residents, and to analyze the disparate impacts of those alternatives. Building the local access bridge first is necessary to ensure uninterrupted access for emergency medical vehicles.

- The FEIS acknowledges that CRC is "especially aware of the sensitive circumstances on Hayden Island" regarding utilities interruption (including water, electricity and sewage services). Yet the FEIS fails to analyze the potential significance of these impacts on HIMHC residents. Given the "sensitive circumstances," namely, elderly and young residents with limited mobility, disabilities and poor health, CRC should analyze the health impacts caused by interruption of utilities, and identify alternatives and mitigation.

D. AIR QUALITY

O-003-005

- The FEIS failed to adequately analyze the potential significance of impacts from air toxics because it does not establish the staging area for construction. The FEIS identifies the current site of the Thunderbird Hotel, on the fenceline of HIMHC, as a possible staging area location, reinforced by informal discussion with CRC staff over the past two years. The FEIS fails to adequately analyze the health and cumulative impacts to HIMHC residents from construction equipment and off-road mobile emissions. CRC should have conducted such analysis in advance of the FEIS to determine whether alternative sites exist that would not result in such disproportionate impacts.

- The FEIS fails to identify and analyze the impacts to HIMHC residents as a result of both air toxic emissions from project construction as well as increased traffic after the bridge

understand that officials representing the Super Center initiated a site plan review with the City of Portland for a relocation and expansion of the Target store. Plans submitted to the City of Portland's Bureau of Development Review indicate that the store could include a grocery and a pharmacy. The plans show, for the Super Center as a whole, a space for a pharmacy, and at least one space for a grocer. We will continue to track this as redevelopment occurs.

O-003-004

The project will work with emergency service and utility providers as the design for the LPA and the approach to construction is further refined. The project has already made commitments to maintaining three through lanes, and to construction-period transit enhancements. The possibility of early construction of the local multimodal bridge will continue to be a consideration by the project as project sequencing is refined. It is discussed in Chapter 2 of the Draft FEIS, (Section 2.3.1), but not as mitigation.

O-003-005

The bullet points below respond directly to your comments (in order):

- See the response to comment O-003-002.
- The air quality evaluation presented in the DEIS assessed how emissions would be expected to change by 2030 and how the project would affect emissions of pollutants regulated by state and federal standards as well as vehicle emissions that are not regulated. Oregon and Washington, as well as the federal government, have established ambient air quality standards for criteria pollutants. These standards are based on human health risks. The DEIS evaluation included an analysis demonstrating that the CRC project would allow the region to retain conformity with state and federal air quality standards for relevant criteria pollutants. See the Air Quality Technical Report for a detailed explanation of

O-003-005

project is completed. CRC is required to analyze both the health and cumulative impacts of the project. Analyzing cumulative health impacts requires analysis of the background, or existing, pollution in the community. The community is currently adjacent to a major construction redevelopment project at the Janzten Beach Mall. CRC failed to conduct a baseline assessment of air quality in order to determine if the construction project will result in additional air toxics above health-based benchmarks. CRC also failed to assess mitigation alternatives such as on-site air quality monitoring.

- The FEIS fails to take into account the particular susceptibility of the community. The majority of elderly residents with existing health concerns or disabilities (a significant number of residents depend on oxygen tanks) are likely more susceptible to any increase in air toxics. Air toxics from demolition, non-road mobile emissions (construction), and on-road mobile (vehicles) will disproportionately impact HIMHC.

- The FEIS fails to adequately analyze the wind patterns on the island to determine the degree of air pollution impacts. HIMHC is directly downwind from the Thunderbird Hotel, the likely staging area for the construction, and in close proximity to the major construction of the Hayden Island interchange and bridge project itself. HIMHC residents will suffer a disproportionate adverse impact due its proximity to this construction.

- The FEIS fails to provide any specific details regarding "prompt removal" of dust pursuant to the dust control plan, nor does it specify the types of chemicals that will be used to control dust. The HIMHC contains significant elderly and young populations who are more susceptible to dust inhalation, and the CRC must analyze the likely impacts to the community and identify mitigation alternatives.

- Under the transportation conformity rules (40 CFR 93.123(c)(5)), CRC must conduct carbon monoxide and particulate matter hot spot analyses for any construction activity lasting more than five years. CRC did not conduct a hot spot analysis for the potential staging areas, the Hayden Island interchange site or the local access bridge site, yet the FEIS fails to analyze the likelihood of concentrated construction activity lasting longer than five years. The health of HIMHC residents will be disproportionately adversely impacted should concentrated construction activity at the Thunderbird Hotel staging area, the Hayden Island interchange or local access bridge last longer than five years.

E. NOISE/VIBRATION

O-003-006

- The FEIS acknowledges potentially significant impacts from noise pollution and identifies noise-dampening walls to mitigate this impact for Vancouver residents, but does not identify specific impacts or mitigation for HIMHC residents. HIMHC residents are likely more susceptible to chronic noise impacts given the average age and health of residents. The FEIS fails to adequately analyze cumulative health impacts, including long-term impacts, and alternative actions or mitigation for HIMHC residents.

- The FEIS fails to analyze the degree to which contributing noise from staging area activities are likely to exceed DEQ Noise Source Standards, disproportionately impacting

5

the state and federal regulations concerning air quality and the evaluation of how the project complies with relevant air quality regulations. See Section 3.10 of the FEIS for an updated explanation of the pollutants regulated by state and federal law.

- Projected reductions in vehicle fleet emissions would result in a 25% to 90% reduction in I-5 related criteria pollutant emissions over existing conditions, even with the anticipated growth in population, employment and VMT. In addition, the build alternatives would provide small further reductions in vehicle emissions at the regional level and for most pollutants in each of the subareas along I-5. CO and NOx emissions would be slightly higher with the project than with No-Build (but still lower than existing conditions) in the I-5 subarea between the SR 14 and SR 500 interchanges, as discussed in DEIS Chapter 3 (Section 3.10) and FEIS Chapter 3 (Section 3.10). The updated analysis conducted for the FEIS resulted in very similar findings to those in the DEIS.
- The project has committed to the following mitigation measures as described on pages 3-283 to 3-285 of the FEIS:
  - Control dust and exhaust emissions from demolition and construction activities.
  - Require contractors to comply with State of Oregon standard specifications (Section 290) fordust, diesel vehicles, and burning activities.
  - Follow State of Oregon's specifications for truck staging areas for diesel-powered vehicles.
  - Use ultra low sulfur diesel for diesel construction vehicles and equipment, or otherwise comply with any new, more stringent regulations in place at the time of construction.
  - Pursue emerging technologies for cleaner construction emissions, like the use of diesel scrubbers for compatible equipment, and continue to encourage and require those types of technologies as bidding laws allow.
  - Require stationary sources, such as concrete mix and asphalt

O-003-006

HIMHC. The FEIS fails to identify and analyze mitigation measures for noise impacts as a result of the use of the Thunderbird Hotel as the primary staging area.

- The FEIS fails to analyze the potential significant impacts from vibration due to project construction and staging area activities on the HIMHC residents. Specifically, the homes in HIMHC are not secured to a foundation and the island itself is fill. Residents' homes, other real and personal property, and residential health and safety could be impacted by vibration caused by project activities.

- The FEIS acknowledges that HIMHC residents are concerned about proximity to the staging area site, yet does not adequately analyze the potential impacts. A statement that "the project has organized many meetings to hear and address these concerns" is inadequate.

F. HAZARDOUS MATERIALS

O-003-007

- The FEIS acknowledges that the Thunderbird Hotel, the likely site for the project staging area, is a former landfill, former site of an auto service station, and is known or suspected to contain pre-existing soil and/or groundwater contamination. CRC has not conducted any testing or screening of this site to determine the extent of contamination. The structure itself may contain asbestos and/or other hazardous toxic materials, all of which may be released into the air, soil and groundwater if the structure is demolished. The FEIS has therefore failed to adequately analyze cumulative health impacts of the project.

- The FEIS acknowledges that the project will result in a minimum of three hazardous materials sites impacting the HIMHC, yet does not identify or commit to remediation of these sites during and after construction.

- The FEIS fails to identify exact locations of the 23 properties older than 1980 being demolished due to the project. These properties are more likely to contain asbestos and lead paint, which may become airborne or contaminate the soil or groundwater. HIMHC residents have been precluded from meaningful participation in the NEPA process with respect to hazardous materials due to CRC's failure to disclose specific necessary information.

G. ENVIRONMENTAL JUSTICE

O-003-008

- The FEIS in inadequate because it fails to recognize the HIMHC as an environmental justice community. There are approximately 1,300 residents of the HIMHC, the majority of which are low-income, elderly residents with limited mobility and/or disabilities with exacerbated health concerns living on social security disability or fixed incomes. CRC utilized an inconsistent and inadequate methodology to determine the demographics of Hayden Island residents. Despite the use of Census block groups to determine the race and income demographics of potentially impacted Vancouver communities and the racial composition of potentially impacted North Portland communities, CRC used the entire Census tract, comprising the entire island, to determine demographics of island residents.

plants, to obtain an Air Contaminant Discharge Permit from either DEQ or SWCAA and to comply with regulations for controlling dust and other pollutant emissions.
    - Manage construction materials and activities to minimize dust, glare and smoke.
- The dust management plan for construction will establish specific protocols for these potential impacts. And the project will coordinate closely with the public on these plans.
- See the response to comment O-003-002.

O-003-006

The noise study in the FEIS was performed in accordance with regulations from the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Oregon Department of Transportation (ODOT), and the Washington State Department of Transportation (WSDOT). The regulations are designed to protect the health and welfare of communities with maximum allowable noise levels from transportation noise. For highway noise in Oregon, the state and federal criteria for consideration of noise abatement is a peak hour Leq of 65 dBA. A detailed traffic noise analysis was performed for the nearest homes at the Hayden Island Manufactured Home Community represented by receivers PD-9 and PD-10. Under the full Build Alternatives, the future noise levels are predicted at 61 dBA Leq, an increase of 4 to 5 dB over the current levels of 56 to 57 dBA. Therefore the future noise levels are within the federal and state criteria and no noise abatement measures are required. Noise levels in Vancouver, where noise abatement is recommended, range from 66 to 77 dBA Leq or more; therefore, noise barriers are recommended. This is because the residences are as close as 50 feet from the highway, while the residences at the HIMHC are over 500 feet from the new bridge. Also, the noise impact criteria does not differentiate residences based on age, race, religion, or other demographics. All residences are treated equally under the noise impact criteria.

O-003-008

This incorrect methodology masks the significant disproportionate adverse impacts to the HIMHC residents due to the more affluent residents living east of the bridge project.

- Through the public participation, HIMHC residents voiced their environmental justice concerns numerous times, including conducting their own residential survey in determining that approximately 50% of the 1,300 residents are low-income. If CRC was unable to identify the demographics of HIMHC at the block group level, CRC should have conducted a residential survey – similar to what they conducted in potentially impacted Vancouver communities and the small Janzten Beach Moorage community just to the south of HIMHC. Such an analysis reveals that HIMHC has a significant low-income population that qualifies as an environmental justice community, requiring more specific identification and analysis of disproportionate impacts and available alternatives and mitigation and more substantial public notice and participation.

- The FEIS fails to use the correct comparison population in conducting a demographic analysis of the HIMHC. CRC should use regional median household income data (i.e., City of Portland, Multnomah County or Portland Metro region) in comparing the median household income of HIMHC residents. Use of the federal poverty standard cannot adequately determine whether potentially impacted communities are low-income relative to non-impacted communities in the project area.

- The FEIS fails to use the most current and accurate income data in determining the median household income of HIMHC residents. At a minimum, CRC must use 2005-09 American Community Survey data, published in 2010. Due to the substantial concerns raised by HIMHC regarding environmental justice, CRC staff should have conducted a door-to-door residential survey to determine the most accurate household income data. The HIMHC is a discrete, compact community that can be easily surveyed, and does not therefore present an undue burden on the agency.

- By failing to conduct appropriate methodological studies of the HIMHC, CRC has failed to comply with Executive Order 12898, requiring each federal agency to identify and address "disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

- While CRC staff engaged in significant interaction with the HIMHC over the three years of project proposal development, the opportunities for meaningful public participation were in fact limited. CRC initially convened a Community and Environmental Justice Group (CEJG) comprised of community residents and representatives from both Vancouver and Portland communities, including residents of diverse economic backgrounds and ethnicities. While agency obtained a veneer of diversity, the CEJG was not given a basic environmental justice training until two years into the process and precluded CEJG discussion of environmental justice concerns, including specific impacts, mitigation measures and community benefit agreements. CRC disbanded the CEJG prior to release of the DEIS.

7

The Noise and Vibration Technical Report, an Appendix of the FEIS, contains a section that is specific to the potential noise related to construction. See Section 5.2, Construction Activities, and Section 6.3, Proposed Mitigation for Adverse Effects during Construction. The governing criteria for noise related to construction in the City of Portland can be found in City of Portland Municipal Code Title 18, Noise Control. Chapter 18.10.060 provides the criteria for construction noise. Under the City's noise control ordinance, virtually all major construction projects require a noise variance if work is planned during nighttime hours or on Sundays. Daytime construction activities are limited to 85 dBA at 50 feet with the exception of trucks (see Section 18.10.020), pile drivers, pavement breakers, scrapers, concrete saws, and rock drills.The contractor would be required to meet the City of Portland Municipal Code Title 18, Noise Control, if the contractor elects to use the site for a staging area. Additionally, the project will require a temporary noise wall be constructed to protect the Hayden Island Manufactured Home Community residents from noise at the Thunderbird staging area.

O-003-007

The FEIS contains a summary of the information obtained during preparation of the Hazardous Materials Technical Report. The Report does have some specific information and research regarding potential contaminants for identified sites. However, it is only for sites identified in regulatory databases, not every property within the corridor. The scope of an environmental impact statement in a large corridor does not include specific on-site investigation of hazardous materials on every single property. It generally looks at summary information for the entire corridor (i.e. regulatory database, aerial photos, Sanborns, and windshield survey) to provide an overview of potential issues and how that could impact the various alternatives. The FEIS recommends a Phase I/II environmental site assessment in any case of acquisition or property use. These site assessments will include different analyses to determine

H. PROJECT SCOPING AND ALTERNATIVES ANALYSIS

O-003-009

- The FEIS fails to analyze an adequate scope of project impacts due to a limited scope of review. The project purpose is unjustifiably limited to improving freight and traffic conditions along the I-5 freeway corridor, yet the north-south flow of traffic through the Portland-Vancouver metropolitan area is regional in nature, with an additional crossing along the I-205 freeway. By failing to consider regional alternatives, and therefore, regional impacts, the FEIS has insufficiently analyzed the ecological, health-based and cumulative impacts of the project.

- Due to the significant disproportionate impacts on a low-income population, Executive Order 12898 and NEPA require CRC to conduct an alternatives analysis that avoids, reduces or mitigates such impacts. The FEIS fails to consider alternatives including improvements to the downriver railroad bridge such that ships can navigate the high passage point of the existing Columbia River bridge, allowing for more modest development and avoiding the need to raise the draw bridge, which forces cars to idle and emit increased air toxics into the HIMHC.

8

the possible contaminants at each site. Contaminants may include asbestos in buildings, leaking underground storage tanks, and other toxics. Any identified toxics will be treated appropriately, in accordance with federal, state, and local regulations.

O-003-008

The demographic data presented for the Hayden Island Neighborhood in Chapter 3 (Section 3.5) of the DEIS was taken from the 2000 U.S. Census and cut to the neighborhood boundaries. The U.S. Census estimated a total of 2,071 residents on the Island, which is in-line with the population estimate of 2,155 residents conducted in 2007 by the City of Portland for the Hayden Island Planning process. In an effort to more accurately reflect the Island population, the FEIS assessment is based on data from the 2010 Census, the American Community Survey, and a project-specific survey of potentially displaced households. Updated population and demographic information can be found in Chapter 3 (Section 3.5) of the FEIS.

The displacement survey (which focused on the most directly impacted households) was undertaken in response to assertions that the Census data misrepresented the affected community. The project utilized the recommended methods for assessing area demographics. In order to better understand the potential disproportionality of impacts, the project went well beyond the standard methods. The displacement surveys were one of the specific ways in which the project assessed the potential disproportionality of the most direct impact a household can experience (a residential displacement). Unlike other populations in the study area, the Manufactured Home Community will not experience any residential displacements. The US Census data indicate that, as a whole, the Hayden Island neighborhood has a lower proportion of minority and low income households than in the City of Portland, Multnomah County, or in the Project study area. Hayden Island ranks near the lower end of the spectrum in both minority and low income household composition when

compared with all other neighborhoods in the study area. Households within the Hayden Island Manufactured Home Community were not surveyed; but these households also will not be displaced. The impacts to these households will result from dust, noise, traffic delays, and other effects during construction. Because many areas along the corridor will experience similar or more severe impacts from construction, there is very little potential for the impacts on Hayden Island to be determined as being disproportionately high and adverse.

The CRC recognizes that there are low income and minority households on Hayden Island. Any individual households, regardless of the demographics of the surrounding neighborhood, have and will be considered as EJ populations and covered by the Executive Order on Environmental Justice. The implementing federal and state guidelines on Environmental Justice have and will guide the project's consideration of, outreach to, and mitigation of impacts for these households.

Since the CRC is a DOT project, the DOT standard for low-income must be used. That standard is the federal poverty guidelines. But the project has gone beyond the use of just this standard and has, as you suggest, compared the neighborhood's demographics with those in the City, County, and study area.

O-003-009

The comment regarding regional alternatives, issues, and impacts is addressed in the responses to the letter from PEAC.

The project would not have disproportionately high and adverse impacts to minority or low income populations (see Section 3.5 of the FEIS).

Downriver railroad bridge improvements were considered and dropped prior to the Draft EIS.

October 24, 2011

Nancy Boyd
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RE: CRC PROJECT COMMUNITY CONCERNS
FEIS COMMENT SESSION

Dear Nancy,

Thank you for coming to our recent Hayden Island Livability Project meeting.

The Hayden Island Manufactured Home Community (1300 people approximately) is largely in favor of the LPA. We live in the "traffic congestion zone", would like improvements in the highway system, and would enjoy light rail to the island.

Our Homeowners Association has a few concerns about the FEIS and the project in general.

Safeway / Full Grocery Store Loss

O-004-001
- Target will NOT be a total substitution for the loss of Safeway on the island
- Target has only marginal fresh meats and vegetables department
- The FEIS states that the addition of light rail will mitigate the loss of Safeway, this is not a logical argument as the people that 'need' Safeway the most will not be riding light rail to the next grocery store. This argument is false.

Arterial Bridge

O-004-002
- Needs to be moved up to the first stages of construction
- Will assure ease of getting to and from our homes during years of major road construction
- Will assure more availability of emergency responders for our aging community
- Needs to NOT be an 'option' in the FEIS

Air Pollution / Noise / Vibration / Utility Services Impacted By During Construction

O-004-003
- Manufactured homes are unique, do not have full foundations, and may not make it through the construction phasing, CRC needs to work with LauTrec to assist homeowners if problems occur

O-004-004
- Air / Noise impacts to community will be high during years of construction, specifics are needed on impacts, mitigation, respiratory clinic for local residents

O-004-005
- Utility Services will be greatly impacted locally, assurance is needed that seniors (many on life support machines) will not suffer needless because of disrupted services

Local Transportation Concerns

O-004-006
- Handicapped parking, "senior citizen" parking needs to be confirmed at light rail station, our community is not in "walking distance" to the station
- Island-wide shuttle during construction (to lessen local traffic) as well as after to get people to light rail needs to be guaranteed

O-004-001

The project has endeavored to avoid the displacement of any businesses, though it is not possible to do so within the densely developed corridor. The project will continue to look for ways in which impacts can be minimized and avoided. The displacement of Safeway is documented in the FEIS. Mitigation for this impact is governed by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. The project will suggest that Safeway relocate on Hayden Island, but cannot require them to relocate in any specific location. The eventual relocation will be a business decision by Safeway.

O-004-002

The local multimodal bridge is part of the Selected Alternative, and the project will consider and seek opportunities to build and open it during, rather than at the end of, overall project construction. However, limited construction funding could lead to some elements being built before others.

O-004-003

There will be monitoring for any structures at risk of being damaged by vibration construction. Damage is highly unlikely for the manufactured homes on Hayden Island.

O-004-004

The project does not plan to build a respiratory clinic but has committed to air and noise reduction mitigation during construction that can help minimize impacts.

O-004-005

The project team, through coordination with the utility owners and construction staging planning, will develop a Conceptual Utility Relocation Plan that indicates how utilities will be relocated, where they

Environmental Justice Community Recognition

O-004-007

- This community was not surveyed (like the Jantzen Beach Moorage), this community was hardly counted in the 2000 census, it's numbers were rolled together with the numbers from the wealthier side of the island, and this segued the island's numbers for the FEIS
- Our community IS an environmental justice community – many of our residents are living at or below the poverty line – we need protection, we are in the impact zone, we need special considerations
- Jobs need to be generated from this community – flaggers, etc.
- Enhancement fund needs to be guaranteed for use to mitigate the liabilities that this community (and Hayden Island as a whole) will bare for this project

Thank you for hearing our comments and concerns and relating them to the FEIS.

Signed,

Pamela Ferguson
President, Home Owners Association
HAYDEN ISLAND MANUFACTURED HOME COMMUNITY
2270 North Broughton Drive
Portland, OR 97217
503-265-9479
pamfergusonpdx@aim.com

and other community members .....

Print Name	Street Address	Signature
PAMELA FERGUSON	2270 N. Broughton Drive, PDX	[signature]
Linda Caso	1501 N. Hayden Island Dr. #14B	Linda Caso
RUSS HOWERTON	12241 N WESTSHORE OR	[signature]
DELBERT LOREE	1503 N. HAYDEN IS. D.R #247	Delbert Loree
Roger STAVER	11638 N Island Cove Ln	[signature]
Richard T. Carhart	134 N. Tomahawk Island Dr.	Richard T. Carhart
~~[illegible]~~	Brad Houton - PDX -	[signature]
Victor Viets	421 N. Tomahawk Is. Dr, 97217	Victor Viets
Tom DANA	1501 N Hayden Island Dr #110	[signature]
Jason Botel	1501 N Hayden Island Dr #38	Jason Botel
MARY LEVINER	12462 N WESTSHORE DR	Mary Leviner
LUCINDA KARLIC	1503 N. HAYDEN IS. DR #28	Lucinda A. Karlic
STEFAN KARLIC	1503 N. HAYDEN IS. DR #28	[signature]
Esther Wright	2630 N. Hayden Isl. Dr. #9	Esther Wright
Kathleen DORR	1503 N. Hayden Is. Dr. #249	Kathleen A. Dorr
Cheryl K. Lund	Slip 17, 2630 N Hayden Island Dr.	Cheryl K. Lund
David Rothenden	1503 N Hayden IS DR #229	[signature]
Kimberly Wing	12730 N Scouler Ave, Portland, OR	Kimberly Wing
Mike Lewis	1501 N. Hayden Island Dr	[signature]
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Dani Johnson	1503 N. Hayden Island	[signature]
Deborah L. Heckhausen	12870 N Image Cahoe Ave, Portland OR 97217	Deborah L. Heckhausen

will be relocated to, how much the relocation will cost, and who is responsible for the relocation (i.e., the DOT or the utility owner). This plan will also propose a schedule for when the utilities should be relocated in coordination with the construction to minimize any potential temporary impacts to utility services. The project team will also work closely with the utility owners to ensure that any temporary outages are communicated to their customers.

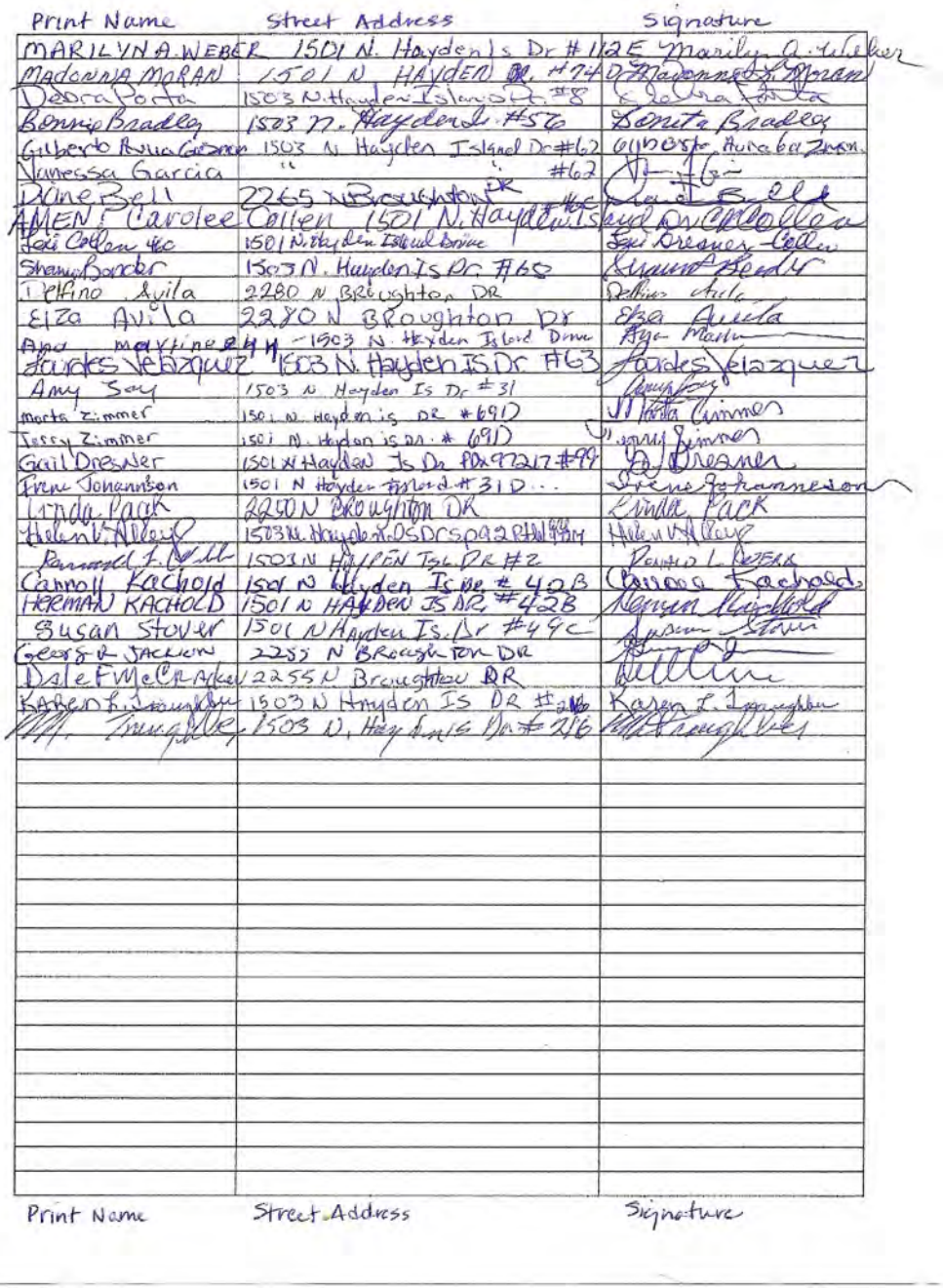
O-004-006

The Hayden Island LRT station cross-section illustrations in the FEIS show a conceptual design with placeholders for station elements. CRC is committed to working with the community to advance the station design. Station design work will take place during final design.

At the December 2010 Portland Working Group (PWG) meeting, TriMet representatives discussed bus service. TriMet will work closely with the contractors during CRC construction to ensure that Line 6 service continues to Hayden Island. When developing a bus service plan along a new light rail line, TriMet re-evaluates all bus service within the vicinity of the new line with the intention of maximizing ridership and limiting service duplications. As part of this process, TriMet conducts ridership, cost, and operational analyses.

The project will work with TriMet and the Hayden Island community to develop a bus service plan during construction and after light rail opens in 2019. Circulator service will be part of this program, though the details will not be finalized without more coordination with Island residents, businesses, and organizations.

On-street parking is shown in the current roadway designs for Tomahawk Island Drive. The project will work with the City of Portland and the Hayden Island community to refine the parking designations near the LRT station. Delta Park will serve as the nearest park and ride



Print Name	Street Address	Signature
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Gilberto Rivera Garcia	1503 N. Hayden Island Dr #62	Gilberto Aurelia Garcia
Vanessa Garcia	" #62	
Diane Bell	2265 N Broughton DR #6	Diane Bell
AMEN! Carolee Collen	1501 N. Hayden Island Dr #6	
Lori Collen 460	1501 N. Hayden Island Drive	Lori Brewer-Collen
Sherry Border	1503 N. Hayden Is Dr #65	Sherry Border
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marta Zimmer	1501 N. Hayden is DR #691	Marta Zimmer
Jessy Zimmer	1501 N. Hayden is DR. # 691	Jessy Zimmer
Gail Dresner	1501 N Hayden Is Dr PDX 97217 #99	Gail Dresner
Irene Johannson	1501 N Hayden Island #310	Irene Johannson
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HERMAN KACHOLD	1501 N HAYDEN IS DR #42B	Herman Kachold
Susan Stover	1501 N Hayden Is. Dr #49C	Susan Stover
George R. JACKSON	2253 N BROUGHTON DR	
Dale F McCrakin	2255 N Broughton DR	
Karen I. Broughton	1503 N Hayden Is Dr #216	Karen I. Broughton
[illegible] Broughton	1503 N. Hayden Island Dr #216	[illegible] Broughton

disproportionately more severe than those experienced elsewhere in the project area.

However, the project recognizes that there are low income and minority households on Hayden Island. And the project will remain open to the potential for specific, vulnerable populations to be present in the HIMHC. The project has worked closely with the community on Hayden Island to identify unique impacts and develop mitigations for these. The implementing federal and state guidelines on Environmental Justice have and will continue to guide the project's consideration of, outreach to, and mitigation of impacts for these households.

The project will be working with the construction contractors to develop means by which local companies can participate in the project and, to the extent allowable by law, will encourage the hiring of local residents.

In the last three years the CRC project team, the Project Sponsors Council, and CRC advisory groups have focused on incorporating a wide range of community enhancements into the project. The project has looked for ways to leverage the highway and transit investments into additional improvements for project neighbors and local communities. These improvements are beyond the benefits identified as the project's purpose and need. These tangible improvements include new local roads, improved local flow, and improved connections for Hayden Island residents; better bike and pedestrian access to the improved facilities; new bike and pedestrian trails; and a separate bridge for local auto access from North Portland to Hayden Island. We know there is more to be done. The CRC remains committed to aggressively maximizing and leveraging resources to bring additional benefits and improvements to our community. Two options have been identified for further exploration; both include a financial set-aside of a specific amount dedicated to a specific purpose. One approach is a project-specific community enhancement fund. There is some history with such an approach - the

Delta Park 1-5 widening project (2006) and Metro's solid waste program (1991) are two examples. The other approach is a different concept, a regional fund established by the state to benefit the neighborhoods and communities in close proximity to 1-5 and the CRC project. Both approaches have been successfully implemented in the Portland region and will help inform this effort. We need to be clear about both of these approaches - neither will be easy. Both approaches have limitations and legal restrictions associated with anticipated funding sources. Both will require legislative support. Both will likely need enabling legislation, and both will require funding.

Hines, Maurice

From: Mike Connors [MikeConnors@hkcllp.com]
Sent: Monday, October 24, 2011 3:39 PM
To: Columbia River Crossing
Cc: Dawn Fulps
Subject: CRC FEIS Comment letter
Attachments: Hayden Island.pdf

O-005-001 I represent Hayden Island Enterprises, the owners and operators of the Hayden Island Manufactured Home Community located on Hayden Island. I am submitting the attached FEIS comment letter on behalf of my client. Thanks, Mike

E. Michael Connors
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O-005-001

Thank you for your comments, which are addressed below.

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October 24, 2011

VIA EMAIL & U.S. MAIL

Columbia River Crossing
c/o Heather Wills
700 Washington Street, Suite 300
Vancouver, WA 98660

Re: Comments on FEIS for CRC project
Hayden Island Manufactured Home Community

To whom it may concern:

O-005-001 This firm represents Hayden Island Enterprises, the owners and operators of the Hayden Island Manufactured Home Community (the "Community"). The Community consists of 440 manufactured home sites, 169 RV sites and a total of approximately 1,500 residents located on East Hayden Island. Hayden Island Enterprises is submitting the following comments on the Final Environmental Impact Statement ("FEIS") for the I-5 Columbia River Crossing ("CRC") project. We spoke with representatives of the Community Homeowners Association about the FEIS and it is apparent that the residents share many of our views and concerns. We request that you forward our comments to the Federal Highway Administration ("FHWA") and Federal Transit Administration ("FTA") as part of their consideration of the FEIS.

1. **LPA Option A – local multimodal bridge.**

O-005-002 Hayden Island Enterprises strongly urges the FHWA and FTA to select LPA Option A because it is the only viable option. The Integrated Project Staff and the Project Sponsors Council recommend LPA Option A after an extensive public process. Hayden Island Enterprises, the Community residents and the public in general overwhelmingly favor LPA Option A. LPA Option B has not been sufficiently vetted or evaluated, and therefore LPA Option B should be removed altogether.

The LPA Option A proposal to include a local multimodal bridge over North Portland Harbor is particularly important to the Community. It is imperative that the CRC project include a local multimodal bridge so that residents are not limited to using the I-5 freeway ramps for access on and off the island. It is also imperative that the local multimodal bridge be built as part of the initial construction phase and not deferred until the later phases of the project. The need for the local multimodal bridge will be even more important during the I-5 bridge construction.

O-005-002

The project is eager to work with emergency service and utility providers as the design for the LPA and the approach to construction is further refined. The project has already made commitments to maintaining three through lanes, and to construction-period transit enhancements. The possibility of early construction of the local multimodal bridge will continue to be a consideration by the project as project sequencing is refined. It is also discussed in Chapter 2 of the FEIS, (Section 2.3.1), but not as mitigation. Although it is not appropriate to describe the early construction as mitigation, it is discussed as something we will explore as we further refine construction staging. Specifically Section 2.3.1 of the FEIS states:

> Similarly, the Marine Drive interchange construction would need to be coordinated with construction of the southbound lanes coming from Vancouver. While this interchange can be constructed independently from the work described above, the completion and utilization of the ramp system between Hayden Island and Marine Drive requires the work to occur in the same period. Early construction of the local multimodal bridge between Marine Drive and Hayden Island, so that it can be used as an alternate access route during the remaining construction period, will be analyzed during final design. The interchange reconstruction also needs to occur so that Marine Drive can be elevated, allowing the light rail extension to cross under Marine Drive. The Marine Drive interchange is expected to take a little more than 3 years to construct, including work at the Victory Boulevard interchange.

2. N. Hayden Island Drive intersection improvement.

O-005-003 Based on our review of the FEIS and conversations with CRC staff at the October 13th drop-in session, it is our understanding that the FEIS proposes to improve the intersection of N. Hayden Island Drive and B Street as a staggered signalized intersection. This intersection design is substantially the same as Concept 4.02 from ODOT's 2009 draft I-5: Hayden Island Interchange Are Management Plan (IAMP).

Hayden Island Enterprises strongly supports this intersection improvement proposal because it is the only proposal considered thus far that maintains the Community's eastern access. This option maintains the Community's existing access and improves the intersection operations and safety. Other options considered by ODOT require the removal of manufactured homes and/or relocation of the access to an area that is not acceptable to Hayden Island Enterprises. This is an extremely important issue for Hayden Island Enterprises and we strongly encourage the specific adoption of this proposed improvement as a necessary mitigation for the CRC project.

3. Use of the adjacent Thunderbird Hotel site.

O-005-004 The vacant Thunderbird Hotel site should not be used for major construction staging because it is adjacent to the Community and will cause substantial impacts to its residents. The FEIS proposes to use the Thunderbird hotel site for major construction staging, but acknowledges that it will exceed acceptable noise levels within the Community and that there is insufficient mitigation proposed. The FEIS provides:

> "The western boundary of the Thunderbird Hotel Site is within 50 feet of the adjacent Hayden Island manufactured home community. Depending on the scheduling of staging activities, the particular equipment used, and the location of the activities on the staging site, the DEQ Noise Source Standards could be exceeded at locations within the adjacent neighborhood. If this site is selected for project staging activities, additional construction noise monitoring and mitigation measures, beyond those discussed in Section 3.11.5, could be required." FEIS, Chapter 3.11, p. 3-303.

The Thunderbird Hotel site cannot be used for major construction staging if it will exceed acceptable noise levels within the Community and adequate mitigation has not been proposed.

If the CRC project insists on using the Thunderbird Hotel site, additional mitigation must be provided. The use of this adjacent site will have substantial noise, vibration, visual and dust related impacts on the residents of the Community. In addition to the construction–related mitigation proposed in Section 3.11.5 of the FEIS, the CRC project should limit the type of construction activity on this site to low impact activities, provide noise and visual mitigation walls and screening, and provide large buffers between the construction activity and the Community.

O-005-003

Thank you for your comments. We will work closely with the community as the designs for the Island are refined.

O-005-004

There are five possible staging areas identified in the FEIS. These staging areas could be used by a contractor, or they may choose their own. This is typical during the planning and NEPA environmental impact assessment stage.

A contractor will determine the exact activities that will occur on any of these sites, or any other site to be used for staging or casting. The contractor, working closely with the DOTs, will need to identify potential impacts and appropriate mitigation, in accordance with applicable federal, state and local regulations.

The project has committed to the following mitigation measures as described on pages 3-283 to 3-285 of the FEIS:

- Control dust and exhaust emissions from demolition and construction activities.
- Require contractors to comply with State of Oregon's standard specifications (Section 290) for dust, diesel vehicles, and burning activities.
- Follow State of Oregon's specifications for truck staging areas for diesel-powered vehicles.
- Use ultra low sulfur diesel for diesel construction vehicles and equipment, or otherwise comply with any new, more stringent regulations in place at the time of construction.
- Pursue emerging technologies for cleaner construction emissions, like the use of diesel scrubbers for compatible equipment, and continue to encourage and require those types of technologies as bidding laws allow.

4. The FEIS is inconsistent with the Hayden Island Concept Plan.

O-005-005 The City of Portland recently adopted the Hayden Island Concept Plan to plan for the future growth and development of Hayden Island after an extensive public process. The Hayden Island Concept Plan provides for a self-sustaining community consisting of mixed-use residential and retail commercial developments with an integrated transportation network that provides better connectivity on the island for vehicles, bicycles and pedestrians.

Although the FEIS claims that the final design will be consistent with the Hayden Island Concept Plan, it is in fact inconsistent with the Hayden Island Concept Plan in several regards. The CRC project will effectively split Hayden Island in two and it fails to address the lack of adequate east-west connections. This will be particularly problematic during the construction phase which will last for several years. The FEIS does not adequately address this issue or offer mitigation to maintain the connectivity on Hayden Island.

The CRC project will eliminate numerous commercial retail businesses on the island, including the Safeway, the Chevron station, the car wash, restaurants and the Wells Fargo Bank. Safeway is the only major grocery and pharmacy option, Chevron is the only gas station on Hayden Island and the Wells Fargo Bank is one of only two banks on the island. The proposed stormwater treatment wetlands will occupy the entire site of the future local retail center shown on the Hayden Island Concept Plan. Removing these important retail businesses will force island residents to travel off Hayden Island to obtain basic retail items, which is wholly inconsistent with the Hayden Island Concept Plan's fundamental goal of creating a connected and self-sustaining community on the island. Although mitigation is offered to the business owners who will be displaced, no mitigation is offered to island residents who will lose a large percentage of their local service businesses. The FEIS fails to address this impact or propose adequate mitigation.

The Hayden Island Concept Plan provides for future waterfront park areas under the CRC landings that are not discussed in the FEIS. It is important that right-of-way lands under the landings of the existing and new bridges be made available for shoreline access and park use. The failure to provide public access is not identified as an impact on the community and is in violation of the Hayden Island Concept Plan.

5. Air, noise and vibration impacts.

O-005-006 Hayden Island Enterprises does not believe the FEIS adequately evaluated and proposed mitigation for construction related air, noise and vibration impacts. The CRC project will impact Hayden Island more than any other stretch of the project. The CRC project should be required to provide a baseline air quality test (as opposed to modeling) and air quality monitoring equipment to monitor air quality during construction. Additional noise and vibration mitigation should be

O-005-007 provided. Hayden Island is more susceptible to noise and vibration impacts due to the soils and geography. Several residents have commented that recent construction activity on the island has had significant noise and vibration impacts even though this construction activity is much smaller in scale than the CRC project. Therefore, noise and vibration mitigation beyond those measures typically provided for such a project should be provided for Hayden Island.

- Require stationary sources, such as concrete mix and asphalt plants, to obtain an Air Contaminant Discharge Permit from either DEQ or SWCAA and to comply with regulations for controlling dust and other pollutant emissions.
- Manage construction materials and activities to minimize dust, glare and smoke.

The Noise and Vibration Technical Report, an Appendix of the FEIS, contains a section that is specific to the potential noise related to construction. See Section 5.2, Construction Activities, and Section 6.3, Proposed Mitigation for Adverse Effects during Construction. The governing criteria for noise related to construction in the City of Portland can be found in City of Portland Municipal Code Title 18, Noise Control. Chapter 18.10.060 provides the criteria for construction noise. Under the City's noise control ordinance, virtually all major construction projects require a noise variance if work is planned during nighttime hours or on Sundays. The contractor would be required to meet the City of Portland Municipal Code Title 18, Noise Control, if the contractor elects to use the site for a staging area.

O-005-005

The project's commitment to construct Tomahawk Island Drive, as identified in the Hayden Island Plan will substantially improve east-west connections on the island. Other improvements will result from reduced congestion and the significant improvement to be made to sidewalks.

Yes refinements and new information resulted in additional displacements. We do not expect that all the businesses assumed to be displaced will necessarily have to be displaced, but it is prudent to be conservative about impacts in the NEPA process. Also, some of the displacements would be affected only by diminished access, not by demolition. It is possible that some of these properties and buildings could be re-occupied by other businesses that would not be so affected

October 24, 2011
Page 4

6. Sound reducing walls along Hayden Island stretch of I-5 freeway.

O-005-007 The CRC project should include sound reducing walls along the section of I-5 that goes over Hayden Island. The FEIS proposes sound reducing walls along several sections of I-5, but not the section that goes over Hayden Island. This section of I-5 will be in close proximity to the Community and several other residences. The CRC project should provide additional noise mitigation to minimize the noise impacts to these residents.

We appreciate your consideration of our comments and request that these proposals be incorporated into the final design of the CRC project.

Very truly yours,

HATHAWAY KOBACK CONNORS LLP

E. Michael Connors

EMC/df

Cc: Hayden Island Enterprises

by the revisions in access.

The transfer of 0.4 acre of surplus land to the City of Vancouver is mitigation for the project's direct impact on the City's existing Waterfront Park, an existing public park and a Section 4(f) resource. The project has no impact to public parks on Hayden Island and therefore no need for such mitigation. The CRC project does not currently propose to convert the existing Thunderbird site on Hayden Island into a public park, but it also does not preclude it from becoming a public park in the future. Decisions regarding the disposal of surplus property after project construction will be made at a later date.

O-005-006

The project has committed to the construction air quality mitigation measures described in response to comment O-005-004.

O-005-007

The Noise and Vibration Technical Report, an Appendix of the FEIS, contains a section that is specific to the potential noise related to construction. See Section 5.2, Construction Activities, and Section 6.3, Proposed Mitigation for Adverse Effects during Construction. Also, the governing criteria for noise related to construction in the City of Portland can be found in City of Portland Municipal Code Title 18, Noise Control. Chapter 18.10.060 provides the criteria for construction noise.

Section 5.2.2 and Section 6.3.2 of the Noise and Vibration Technical Report provide a section on construction vibration. Although there are no state or federal regulations related to construction vibration, the contract specification will have a section that would likely limit the contractor to a maximum vibration level. The majority of major vibration-producing activities will be more than 300 feet from the nearest home on the Island. Therefore, it is unlikely that vibration levels at that distance will be of sufficient magnitude to result in any structural issues, even for the

manufactured homes.

However, the project also will work to avoid and minimize any vibration which would adversely affect the quality of life for Island residents. The project will work with contractors, especially in regards to activities at the Thunderbird Staging area, to minimize the vibration impacts for residents. Further analysis and vibration monitoring will be completed, and these analyses will take into consideration the specific soil structure of different areas.

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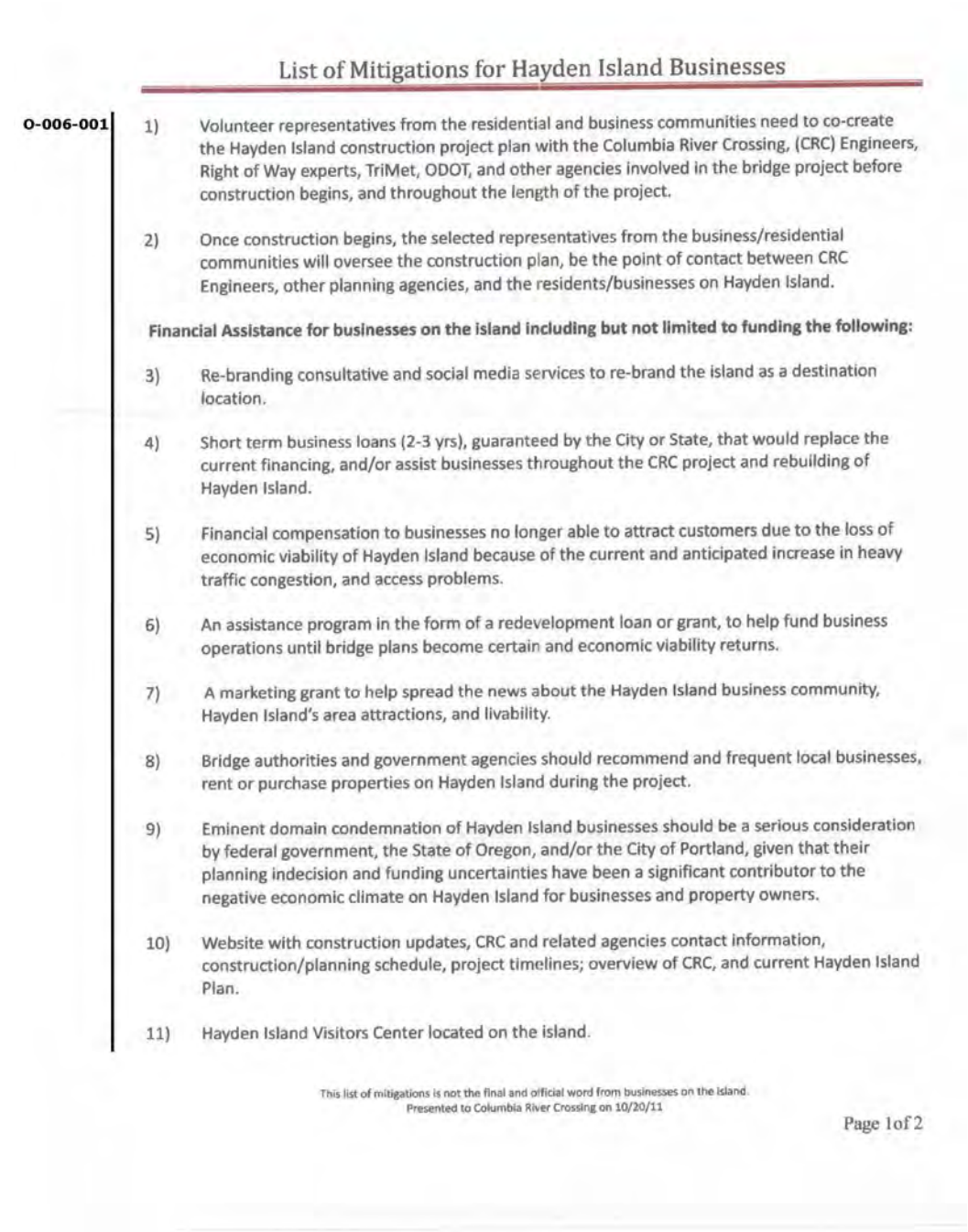

List of Mitigations for Hayden Island Businesses

O-006-001

1) Volunteer representatives from the residential and business communities need to co-create the Hayden Island construction project plan with the Columbia River Crossing, (CRC) Engineers, Right of Way experts, TriMet, ODOT, and other agencies involved in the bridge project before construction begins, and throughout the length of the project.

2) Once construction begins, the selected representatives from the business/residential communities will oversee the construction plan, be the point of contact between CRC Engineers, other planning agencies, and the residents/businesses on Hayden Island.

Financial Assistance for businesses on the island including but not limited to funding the following:

3) Re-branding consultative and social media services to re-brand the island as a destination location.

4) Short term business loans (2-3 yrs), guaranteed by the City or State, that would replace the current financing, and/or assist businesses throughout the CRC project and rebuilding of Hayden Island.

5) Financial compensation to businesses no longer able to attract customers due to the loss of economic viability of Hayden Island because of the current and anticipated increase in heavy traffic congestion, and access problems.

6) An assistance program in the form of a redevelopment loan or grant, to help fund business operations until bridge plans become certain and economic viability returns.

7) A marketing grant to help spread the news about the Hayden Island business community, Hayden Island's area attractions, and livability.

8) Bridge authorities and government agencies should recommend and frequent local businesses, rent or purchase properties on Hayden Island during the project.

9) Eminent domain condemnation of Hayden Island businesses should be a serious consideration by federal government, the State of Oregon, and/or the City of Portland, given that their planning indecision and funding uncertainties have been a significant contributor to the negative economic climate on Hayden Island for businesses and property owners.

10) Website with construction updates, CRC and related agencies contact information, construction/planning schedule, project timelines; overview of CRC, and current Hayden Island Plan.

11) Hayden Island Visitors Center located on the island.

This list of mitigations is not the final and official word from businesses on the island.
Presented to Columbia River Crossing on 10/20/11

Page 1of 2

O-006-001

Thank you for the constructive suggestions. While some of these measures are likely not feasible, many of them are possible and will be included in discussions with Hayden Island business owners as a detailed plan for supporting businesses during construction is developed. Please see the response to comment letter N-003.

List of Mitigations for Hayden Island Businesses

O-006-001

12) A hotline for people to call about CRC construction, theft, vandalism, an accident, or if there is a problem associated with the construction.

13) Financial Assistance to attract new businesses to Hayden Island before and during construction.

14) Early construction of the Hayden Island local arterial bridge to ease traffic bottlenecks on/off the island during construction.

15) Create reliable transportation during the construction.

16) Ensure traffic can enter and exit the island with ease.

17) Enhanced security services for vacant residential and business properties. More police presence on the West & East sides of Hayden Island.

18) A satellite police station needs to be placed in a visible location on Hayden Island with routine daily and nightly island patrols!

19) Home and business inspections before and after construction for any possible damages caused by construction vibrations especially for those that are closer to the staging areas and river.

20) Additional streetlights need to be added to ensure safety at night for pedestrians and motorists. Especially on the newly created "main street" of town.

21) City/State/Federal Government need to supply a large billboard alerting drivers on I-5 South and I-5 North that "Businesses Are Open." Also, small signs strategically located throughout Hayden Island and on the West and East sides of the Island for pedestrians, bike riders and slow moving motorists.

22) The Island Community made up of residents and businesses expects support from the City, State, Federal Government, Portland Development Commission; Metro, Business Oregon, Venture Portland, TriMet, and other governing agencies to financially assist in ways to attract more business to the island.

This list of mitigations is not the final and official word from businesses on the island.
Presented to Columbia River Crossing on 10/20/11

Page 2of 2

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Sent via Electronic and Regular Mail

Ms. Wills, Mr. McAvoy and Mr. Saxton:

O-001-001 The Pacific Environmental Advocacy Center (PEAC) submits this request on behalf of the following organizations: Northwest Environmental Defense Center (NEDC), Coalition for a Livable Future and Rosemere Neighborhood Association. PEAC requests a 60-day extension of the deadline for public comments on the Final Environmental Impact Statement (FEIS) of the Columbia River Crossing (CRC). The current 30-day comment period is wholly insufficient for the public to analyze the massive FEIS, which is a significantly different from the DEIS.

O-001-001

FTA and FHWA sent a formal reply to PEAC's request, declining to extend the deadline for public comments on the FEIS.

O-001-001

To illustrate some changes, both the "Ecosystems" and the "Air Quality" sections of the FEIS are significantly different from the DEIS. The "Ecosystems" section in the FEIS contains more than 400 pages of new material compared to DEIS. Furthermore, the FEIS includes a Biological Opinion located at Appendix N which was not available with the DEIS. The "Air Quality" section also contains significant changes from the DEIS. Specifically, the FEIS introduces new points of discussion that were not presented in the DEIS (e.g. the Ruby Junction Maintenance facility). The FEIS also significantly expands both subsection 3.10.4 (Temporary Effects) and the "Temporary Effects" portion under subsection section 3.10.5 (Mitigation or Compensation) of the "Air Quality" section. A 90-day comment period would ensure that public participation in the National Environmental Policy Act (NEPA) process is meaningful and not merely a procedural formality for approving the CRC.

CRC circulated the DEIS in May of 2008. Three years and four months later, CRC then released the FEIS. In this time, CRC illegally did not supplement the draft EIS. A 90-day comment period is imperative considering the substantial changes from the DEIS to the FEIS. If supplements had been provided to allow the public to analyze new materials in a timely fashion, perhaps a 30-day final comment period would be sufficient. Where, as here, however, the FEIS is significantly different from the DEIS, a 90-day comment period is essential for meaningful public participation.

O-001-002

Concerned citizens and implicated agencies cannot adequately participate in the NEPA process if they are only given 30 days to analyze and comment on the thousands of pages of the highly technical document. Meaningful public participation is central to the NEPA process. NEPA requires the sponsoring agencies to "make diligent efforts to involve the public in preparing and implementing their NEPA procedures." 40 CFR § 1506.6(a). The Federal Highway Administration's (FHWA) NEPA regulations further reflect the need for genuine public input, stating FHWA's policy that "[p]ublic involvement and a systematic interdisciplinary approach be essential parts of the development process for proposed actions." 23 CFR § 771.105(c). FHWA cannot seriously assert that a 30-day comment period meets its requirement to make public input an essential part of the finalizing the FEIS.

O-001-003

While CRC's CD containing the FEIS also contains responses to comments it received on the DEIS, that fact alone does not demonstrate that public concerns were adequately addressed. To fully complete the NEPA process, CRC must "provide a 'meaningful reference' to all responsible opposing viewpoints concerning the agency's proposed decision;" see *State of California v. Block,* 690 F.2d 753 at 773 (1982), see also 40 CFR § 1503.4. For the public to intelligently review over 1,600 public comments from the DEIS and CRC's responses to those comments within 30 days places an unreasonable burden on the interested public's efforts to ensure that CRC has satisfied the relevant regulations.

O-001-002

The project has been soliciting public input and providing public information throughout the process of developing the FEIS. The FEIS describes specific outreach and involvement efforts that occurred and how they have influenced the project. The locally preferred alternative was selected in the summer of 2008 and has been the subject of extensive public and agency coordination and input since then. The findings and conclusions in the FEIS are not fundamentally different from the DEIS. Many of the changes in the FEIS were in response to input received from citizens and other stakeholders. While the FEIS is not subject to a formal public comment period as the DEIS is, FTA and FHWA solicited comments on the FEIS prior to finalizing the NEPA process.

O-001-003

Please see responses above.

Whether or not citizens read the entire FEIS, all DEIS comments, and all responses to DEIS comments is not really the test for determining whether or not public concerns were adequately addressed. As noted in the responses above, there has been extensive public outreach and input during the preparation of the FEIS, many of the findings were released to the public before the FEIS was published, and many of the meaningful refinements since the DEIS have been the result of public outreach.

In addition, each person who commented on the DEIS was provided reasonable opportunity to review the response to his or her comments, as well access to any other comments and responses. For those who did not wish to review all 1,600 comments, the FEIS provided a summary of the most common comments received and responses to them (Chapter 6--Public Input on the Draft EIS).

O-001-004

FHWA and the Federal Transit Authority (FTA) have the authority to extend the commenting period beyond the 30-day public comment period. 40 CFR §§ 1506.10 (d), 23 CFR § 771.125; 23 CFR § 771.127(a) The circumstances of the FEIS makes such an extension particularly appropriate here. NEPA implementing regulations stipulate that in determining the appropriate time limit for a comment period, an agency may consider several factors, including: the potential for environmental harm, 40 CFR § 1501.8(b)(1)(i), the size of the proposed action, 40 CFR § 1501.8(b)(1)(ii), the number of persons and agencies affected, 40 CFR § 1501.8(b)(1)(v), and the degree to which the action is controversial, 40 CFR § 1501.8(b)(1)(vii). The CRC implicates each of these factors.

The CRC is a major transportation project with the potential to cause significant environmental harm to the water quality and ecosystems of the Columbia River, a vital habitat for fish species protected under the Endangered Species Act; the air quality of the Portland metropolitan area; wetland areas; environmental justice communities; local parks and green spaces threatened by urban sprawl; and historic preservation areas. If FHWA does not extend the comment period, citizens will not be able to consider all environmental impacts and will only be able to superficially analyze even the most apparent issues. Providing an extra 60 days is a minor delay given the CRC's potential environmental harms.

The CRC is one of the largest public works project to ever affect this region, and thus warrants a commensurately substantial comment period. The minimum estimated cost of $3.1 billion will tap into a significant portion of the region's transportation budget. This lengthy construction project will have significant impacts immediately and long into the future in two states, two cities and a major regional waterway. The invested parties bearing the brunt of these impacts deserve a legitimate opportunity to carefully analyze the changes from the DEIS to intelligently comment on the FEIS.

Further, the comment period the comment should be extended because the project directly affects millions of citizens and dozens of local, state and regional agencies. CRC has already included twelve local, regional and national agencies in addition to nine federally recognized and non-federally recognized tribes on this project. More than 12,000 community members have engaged in the CRC process since 1995. While the involvement of these agencies, tribes and citizens in the initial planning stages has been beneficial, the public still needs adequate time to comment on the FEIS after the September 23, 2011 publication.

Finally, the CRC is a controversial project that is at the forefront of public attention in the Portland/Vancouver area. Several affected groups have developed passionate and diverse opinions about the project that must not be stifled. The stakes of this project, and thus of the FEIS, are high and CRC needs to allow sufficient time to consider the issues presented by those affected. With groups positioned on all sides of the proposal, some positions will inevitably lose

O-001-004

The fundamental finding of impacts did not change meaningfully between the DEIS and FEIS. Both documents disclose that the project will not cause significant harm to water quality, ecosystems, air quality, wetlands, EJ communities, or induced sprawl. The project would have significant impacts to parks and historic resources, although the impacts were reduced through project refinements following the DEIS. This information was the subject of public outreach, and the revisions were made in part to reflect public and agency input during the preparation of the FEIS.

FTA and FHWA previously sent a formal reply to PEAC's request regarding the comment period.

O-001-004

to others. When this happens, CRC will face scrutiny by unsatisfied parties that feel the participating agencies did not provide them an opportunity to meaningfully comment on their concerns. CRC should respect the controversial nature of the project by allowing for a more appropriate time period to explore all aspects of it. The current 30-day comment period will limit commenting parties to superficial analyses, heightening tensions and unjustly serving all.

In short, all parties involved will benefit from an extension of the public commenting period, and the project will not be adversely affected by an extension. Therefore, CRC should grant an extension of the public comment deadline until December 23, 2011.

Sincerely,



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RE: Comments on September 2011 Final Environmental Impact Statement for the Interstate 5 Columbia Crossing Project

Introduction

O-002-001

The Pacific Environmental Advocacy Center ("PEAC") submits the following comments on behalf of its clients Coalition for a Livable Future, the Northeast Coalition of Neighborhoods, the Rosemere Neighborhood Association, Northwest Environmental Defense Center, Columbia Riverkeeper, the Portland Audubon Society, Oregon Public Health Institute, Upstream Public Health, and Association of Oregon Rail and Trail Advocates. These comments will refer to these groups collectively as "PEAC" but, to be clear, "PEAC" is in fact representing the concerns and views of a broad and diverse coalition of groups.

The voluminous Columbia River Crossing ("CRC") Final Environmental Impact Statement ("FEIS"), approved by the Federal Highway Administration ("FHWA") and the Federal Transit Administration ("FTA") (collectively "the Federal agencies"), purports to analyze and disclose the impacts of what can best be described as a massive monument to the mid-twentieth century motor vehicle mentality. The CRC's Locally Preferred Alternative

O-002-001

Each of the points in the introduction is expanded upon in the later comments in this letter. Several key points in this letter's introduction are:

1. The LPA has too many environmental impacts and is not sustainable;
2. There should have been a Supplemental DEIS;
3. Traffic projections are wrong; and
4. Alternatives with fewer impacts weren't considered, and alternatives were dismissed with just a checklist.

The following provides responses to the issues listed above. Additional information can be found in the responses to the subsequent and more detailed comments in this letter.

The LPA's and other alternatives' environmental impacts are described in the FEIS and detailed in the CRC FEIS technical reports and other project reports as referenced in the FEIS. Considerable work and coordination went into refining designs in order to avoid impacts where possible, minimize those that could not be avoided, and mitigate the remaining impacts where practicable. Chapter 2 of the FEIS describes how alternatives evolved and were refined over time. Chapter 3 describes the impacts.

See responses below regarding sustainability, GHG emission reductions, water quality improvements, and the minimization of and mitigation for impacts to fish.

Regarding a supplemental DEIS, new information and design refinements completed after the DEIS were considered and reviewed by FTA and FHWA, consistent with 40 CFR 1502.9(c)(1) and 23 CFR 771.130(a). See the discussion on page 2-86 and the documentation in Appendix O (NEPA Determinations) of the FEIS. None of the project

O-002-001

("LPA") sprawls across north Portland, Hayden Island, the Columbia River, and into Vancouver, Washington, dwarfing the bridges it intends to replace, adding substantial new motor vehicle capacity and multiple new or enlarged highway interchanges, covering many additional acres of land with new impermeable surfaces, and creating a new, much larger obstacle that migrating salmon will have to maneuver under and around. Adding a light rail line and "improved" bicycle facilities is simply putting green lipstick on an environmental pig. Those "add-ons" do not change the fact that this project is, and from the beginning has been viewed by its proponents as, primarily a major highway expansion project. On its face the CRC certainly looks like the exact opposite of what many individuals, groups and governmental bodies in Oregon and Washington have been trying to promote, encourage and legally require in terms of sustainable development, sustainable transportation solutions, actual reductions in water pollution and air pollution (including greenhouse gas emissions) and real improvements in salmon habitat.



Model on Display at CRC Headquarters, October 2011

refinements made after the DEIS would result in new significant environmental impacts that were not previously evaluated in the DEIS. New information and design refinements were shared with the public, and much of the work was in response to public and agency input. There is no need to prepare a supplemental DEIS. See responses to PEAC's specific comments below.

The traffic forecasting methodology used for the CRC project is based on regional growth plans and uses the same models used for all transportation projects undertaken for the Portland-Vancouver region. CRC did not assume uniform growth of traffic from year to year. Estimating future traffic volumes requires a dynamic model with inputs on land use, socioeconomics, trip origins and destinations, and travel mode and route choice. The traffic forecasts used for the CRC project are based on the regional transportation forecasting model developed and operated by Metro and the Southwest Washington Regional Transportation Council (RTC). A multi-jurisdictional team, including all of our local partners, has reviewed CRC traffic modeling forecasts. In addition, an expert review panel composed of national experts in the field of traffic modeling conducted an independent analysis in 2008 and validated the methods and results. The panel found that the travel demand model used for CRC is an advanced trip-based tool and that it was a valid tool for a project of this type. See further discussion below and in responses to letter P-047.

See also the January 21, 2011 memorandum from ODOT Director Matt Garrett to members of the Oregon legislature. This memo responds to comments that Mr. Chris Gerard sent to members of the Oregon legislature in October 2010. The memo is located on the CRC website at:
http://www.columbiarivercrossing.org/FileLibrary/Memorandums/PlaidPantry_Response.pdf

O-002-001

But not to worry, throughout the FEIS the public is told that the LPA is the best, "sustainable" way to address future transportation needs in the "Bridge Influence Area" ("BIA"), and will supposedly have much lower environmental impacts on most resources and, at worst, essentially the same adverse impacts on significant resources like the region's threatened salmonid species. Such counter-intuitive conclusions should, consistent with the specific requirements of the National Environmental Policy Act, 42 U.S.C. § 4321, *et seq*., and its implementing regulations, 40 C.F.R. §§ 1500.1-1508.28, ("NEPA") be supported by extensive and well-documented analysis using the best available information. The Draft Environmental Impact Statement ("DEIS") failed miserably in that regard as PEAC's DEIS comments, and the comments of many others, documented. More than three years later the FEIS attempts to address those failings in the DEIS by adding the "refined" LPA, and substantial additional analysis, including, in particular, analysis regarding impacts on salmon. There are at least two problems with this "cure" for the inadequate DEIS.

First, as explained below, it is illegal under NEPA to issue a cursory DEIS for public scrutiny and to then, more than three years later, dump much of the detailed analysis that NEPA requires of the DEIS into the FEIS. Such a process does not give the public a meaningful opportunity to scrutinize and comment on the CRC's actual analysis and reasoning regarding their assertions of insignificant or improved impacts. Curiously, although the CRC spent millions of dollars on new and updated analyses, it refused to update the DEIS's incorrect and inflated traffic projections even though new, contradictory traffic information was available and consultants hired by the state of Oregon both concluded that the DEIS's traffic projections were significantly overstated.

Almost all of the other descriptions, quantifications and analyses of environmental impacts depend upon the reliability of CRC's traffic projections. Thus, CRC's refusal to update the

A wide variety of components, proposals, and other ideas were proposed and considered. Proposals that did not meet the fundamental needs of the project were not reasonable and did not need be further evaluated. The AORTA alternative had many elements in common with ideas that had been previously evaluated--and dropped--prior to the DEIS because they could not meet the purpose and need and/or had significant feasibility problems. The AORTA alternative did not correct these deficiencies. The "Straight Alternative" emerged after the DEIS and had some concepts similar to previously evaluated ideas, as well as some unique elements. The Bridge Expert Review Panel reviewed the "Straight Alternative" and did not recommend that CRC advance it. The CRC staff also reviewed it and found that it had substantial performance deficiencies, additional constructability issues, and additional impacts, as outlined in an August 25, 2011 memorandum from Frank Green and Casey Liles to Nancy Boyd, CRC Project Director. See additional discussion in the following responses to PEAC comments. The checklist in Appendix D (Early Screening of Project Components and Evaluation of Alternatives Packages) of the FEIS summarizes the results of an initial screening test of a long list of proposed ideas for the river crossing and for transit. This pass/fail test eliminated proposed ideas that could not adequately address the relevant elements of the purpose and need for the proposed action. The remaining ideas (components) were passed forward to the next evaluation step, as discussed in Chapter 2 of the FEIS.

O-002-001

DEIS information that most clearly needed to be updated ignores NEPA's requirement that an EIS include "high quality" information, and causes many of their conclusions and assertions in the FEIS to be arbitrary and capricious. This combination of a cursory DEIS, significant new information regarding traffic forecasts, the significant new analyses added to the FEIS and the substantial changes to the LPA combine to trigger the federal agencies' obligation under 40 C.F.R. § 1502.9(a) and (c) to prepare a supplemental draft EIS so that the public will have a meaningful opportunity to scrutinize and comment on all of these changes and new information. Rather than doing that, the CRC actually went out of its way to limit its consideration of alternatives and changes to the project to only those that arguably would not trigger the need for an SDEIS. Those efforts violated both the letter and spirit of NEPA generally and 40 C.F.R. §§ 1500.2, 1502.9 and 1502.14, specifically.

Second, despite taking more than three years to prepare the FEIS, that NEPA document still fails to adequately address many of this massive project's impacts and still fails to satisfy many of NEPA's very specific requirements. Despite numerous comments criticizing the CRC's overly narrow definition of the project's purpose and need, that portion of the DEIS remains essentially unchanged in the FEIS, in violation of 40 C.F.R. §§ 1502.3 and 1502.14. That unreasonably narrow statement of purpose and need continues, in the FEIS, to lead to an impermissibly narrow range of alternatives.

The FEIS considers only alternatives that focus on highway capacity expansion and still fails to consider any alternative that attempts to address the area's transportation needs by focusing on things other than adding additional traffic lanes over the Columbia River. In DEIS comments, the CRC was presented with multiple viable alternatives, and has continued to receive viable alternative bridge proposals during the more than three years between the DEIS and FEIS,

O-002-001

including at least one that would have addressed even the CRC's overly narrow purpose and need statement without building a sprawling replacement bridge. A vigorous comparison of alternatives is the heart of an EIS and the public was entitled to see and compare alternatives that approached the transportation needs of the area in different ways. Instead the CRC unilaterally made judgment calls about what tradeoffs were appropriate and what impacts were acceptable or necessary and limited the FEIS's comparison to one between no action whatsoever and spending billions of dollars on expanding highway capacity.

Indeed one tradeoff that was not disclosed in the DEIS, but that became apparent when the DEIS bridge design was reexamined, was the CRC's decision not to even consider bridge design alternatives that may have significantly decreased impacts on salmon. The CRC had before it bridge designs that would have required far fewer in water piers and a much narrower "footprint" over the river. The CRC, however, failed to even disclose such potentially beneficial designs in the DEIS and refused to include them in the FEIS or a supplemental DEIS, even after they were put forth by an independent review panel as viable options. This failure to consider such viable, less environmentally harmful options violates 40 C.F.R. §§ 1500.2(e), 1502.14, and the federal agencies' endangered species conservation obligations under 16 U.S.C. § 1536(a)(1).

The FEIS also fails to adequately and properly consider the likely adverse impacts to many of the regions resources, in part because it often improperly limits analysis to the BIA even though the potential adverse impacts from this proposal will clearly cascade far beyond that artificial boundary. In terms of the duty to evaluate cumulative impacts, the FEIS merely contains a series of conclusory assertions regarding the supposed absence of such impacts. But conclusory and unsupported assertions do not satisfy NEPA's requirement for a detailed statement. *Trout Unlimited v. Morton,* 509 F.2d 1276, 1284 (9th Cir. 1974). The analysis of

O-002-001

impacts to water resources, including both surface and groundwater, is still quite incomplete and fails to support many of its assertions of no or limited impacts. That is simply unacceptable for a proposal that will create at least 43 acres of new impermeable surfaces and their associated storm water runoff. The air analysis in the FEIS was significantly revised, but in part because of its invalid traffic forecasts and assumptions, still fails to address many of the localized impacts to the neighborhoods along the I-5 corridor including in particular impacts from hazardous air pollutants. The traffic forecasts in the FEIS, as already noted, are hopelessly flawed and those flaws infect the related and new tolling and financial analysis. Rather than address the likelihood of induced growth, as 40 C.F.R. § 1508.8(b) requires, the FEIS includes a new report "explaining' why there will be no induced growth from the LPA's added highway capacity. The FEIS also fails to adequately address human health issues and improperly refuses to treat neighborhoods in Vancouver as environmental justice communities.

Finally, and perhaps most significantly, the FEIS fails to acknowledge and independently analyze all of the adverse impacts that the LPA and other action alternatives would have on salmon, specifically, and aquatic resources generally. The FEIS's analysis of these important issues is significantly expanded from the DEIS, and there is no excuse whatsoever for why all of this new analysis was not contained in the DEIS, as is strongly encouraged by 40 C.F.R. § 1502.25, and required by 40 C.F.R. § 1502.9(a). But this new analysis, partly contained in the Biological Opinion ("BiOp") prepared by the National Marine Fisheries Service ("NMFS"), also completely misses the mark by failing to address all impacts on salmon, including cumulative impacts from this huge project and the many other projects on the Columbia and Willamette Rivers that are already adversely affecting salmon. Indeed a complete analysis is especially important when the CRC is seeking to kill and harass salmon in the Columbia well outside the

O-002-001

standard in-water work window that has been put in place specifically to prevent such adverse effects. The federal agencies' obligations under NEPA and under Section 7(a)(1) and 7(a)(2) of the ESA clearly requires a much broader and more comprehensive analysis of all adverse impacts on salmon than is contained in the FEIS or the BiOp.

Overall it is remarkable how much incomplete and missing analysis is found when the public reviews this FEIS, which has already cost Oregon and Washington taxpayers more than $130 million. This would be Oregon's largest public works project, and its taxpayers and the taxpayers of Washington are entitled to a much more thorough and complete analysis, a true comparison of all reasonable alternatives that "sharply defines the issues and provide[s] a clear basis of choice among options" (40 C.F.R. § 1502.14), and a meaningful opportunity to review and comment on all of those things in a supplemental DEIS.[1]

Failure to Prepare a Supplemental DEIS

O-002-002

The CRC staff's and the federal agencies' explanations for why a supplemental DEIS is not required ignore and misconstrue numerous regulations and statutes. More importantly their arguments focus on only one of the several factors that combine to make a supplemental DEIS the only possible course that complies with both the specific language of the applicable laws and their spirit.

NEPA's disclosure goals are two-fold: (1) to insure that the agency has carefully and fully contemplated the environmental effects of its action, and (2) "to insure that the public has sufficient information to challenge the agency." *Idaho Sporting Congress v. Thomas*, 137 F.3d

[1] When responding to PEAC's FOIA requests the Federal agencies improperly withheld a large number of documents. PEAC administratively appealed that decision on July 5, 2011, and the Federal agencies have not yet responded to that appeal. *See* NEPA Process/FOIA Appeals Materials Folder. When PEAC obtains the improperly withheld documents it reserves the right to submit additional comments based on those documents.

O-002-002

The new information and design refinements completed after the DEIS were the types of changes commonly made between a draft and final EIS. The revisions to the alternatives reflected community and agency input intended primarily to reduce impacts, lower costs, or further advance the design in order to better identify appropriate mitigation and to comply with other environmental regulations. These refinements have not significantly changed the alternatives that were included in the DEIS nor have they resulted in any meaningful changes in the analytical findings from the DEIS.

These refinements were considered and reviewed by FTA and FHWA, consistent with 40 CFR 1502.9(c)(1) and 23 CFR 771.130(a). See the discussion on page 2-86 and the documentation in Appendix O (NEPA Determinations) of the FEIS. None of the project refinements would result in new significant environmental impacts that were not previously evaluated in the DEIS. New information and design refinements were shared with the public, and many of the project refinements were made in response to public and agency input. See responses to PEAC's specific comments below. See responses to later comments in this letter that expand upon the points made in this comment.

O-002-002

1146, 1151 (9th Cir. 1998) (overruled on other grounds by *The Lands Council v. McNair,* 537 F.3d 981 (9th Cir. 2008); Robertson *v. Methow Valley Citizens Council,* 490 U.S. 332, 349 (1989); *see also* 40 C.F.R. §§ 1500.1 and 1500.2. The CRC's refusal to prepare a SDEIS implicates both of those goals, but it falls most heavily on NEPA's requirement that the analysis be subject to vigorous and meaningful public scrutiny. NEPA's public scrutiny requirement is most directly implemented by the CEQ regulations requiring: (1) that agencies first prepare a draft EIS that "fulfill[s] and satisf[ies] to the fullest extent possible the requirements established for final statements," 40 C.F.R. § 1502.9(a); (2) that federal agencies must solicit public comment on that statement, 40 C.F.R. § 1503.1; and (3) that agencies must respond to those comments from the public (in its FEIS) and if necessary make changes to the DEIS. 40 C.F.R. § 1503.4. There is no requirement that agencies must respond to comments on an FEIS and because it is final, changes to an FEIS in response to comments are not possible. Thus the only meaningful opportunity for the public to scrutinize and challenge an agency's NEPA analysis is when the public reviews the analysis put forth in the DEIS.

Contrary to repeated assertions by CRC staff at public hearings, there is absolutely nothing in NEPA, CEQ's regulations, or FHWA's NEPA regulations, that allows, or even suggests, that a DEIS can contain less rigorous or detailed analysis than an FEIS. Moreover there is also nothing in those regulations that says an agency can wait until after it publishes a DEIS to prepare the analyses necessary to support or explain its conclusions regarding all of the impacts that it must consider under NEPA. In fact 40 C.F.R § 1502.25 requires that, "to the fullest extent possible" the analysis required by statutes like the ESA shall be prepared concurrently with and integrated into the draft EIS. Indeed, if a draft EIS could be issued quickly and initially without all of the necessary analysis, and the agency could then take its time to add all of the detail into the FEIS,

O-002-002

there would be no need for a regulation like 23 C.F.R. § 771.129, which requires a written evaluation of the DEIS when the agency takes more than three years to issue the FEIS. If it was standard practice to produce a cursory DEIS and to do all the required analysis later and include it in the FEIS, it would not matter how much time had passed between the publication of a DEIS and the publication of the FEIS.

Finally, although the Federal Agencies have cited 23 U.S.C. §139(f)(4)(D) to support their argument that detailed analysis of the LPA can wait until the FEIS, that statute in fact says no such thing. It does say that an agency can decide to provide more detail regarding a LPA, but an LPA usually should be identified in the DEIS, *see* 40 C.F.R. § 1502.14(e), and any additional detail included in the DEIS. More specifically, there is nothing in NEPA or any other applicable law that allows the CRC to issue a DEIS with technical reports that cite nothing specifically in support of its "analysis" and to then include revised technical reports with the FEIS that suddenly include the citations required by 40 C.F.R. § 1502.24. This is not simply adding "detail" or "refinements" regarding the LPA. This is suddenly including the very basic analysis and support for an agency's assertions, assumptions and conclusions only in a FEIS and thereby avoiding any real public scrutiny of that essential analysis.

There is no reason most if not all of this new analysis could not have been included in the DEIS. The CRC staff and Federal Agencies simply chose not to include it and to issue a woefully incomplete DEIS. Indeed the fact that it has taken the CRC staff more than three years to issue the FEIS clearly shows that they decided to issue a cursory DEIS, that is really only a very lengthy scoping document, and to then prepare some of the detailed supporting analysis that NEPA requires. But NEPA does not allow them to make such an anti-democratic choice that essentially cuts the public out of the analytical processes underlying the FEIS. Under NEPA you

O-002-002

cannot let your DEIS horse out the barn for public scrutiny unless it is pulling a fully-loaded and detailed analytical cart.

As was explained in PEAC's DEIS comments, the DEIS was a completely inadequate document lacking much basic and essential analysis to support its repeated assertions of no or limited impacts. What analysis there was often lacked supporting citations, even in its so-called "technical reports." It was impossible for the public to meaningfully scrutinize the CRC staff's assertions and conclusions without this underlying analysis and support. Thus, under 40 C.F.R. § 1502.9(a), a supplemental DEIS was necessary.

The CRC has now done some of the necessary, detailed and supporting analysis for its conclusions and assertions. For example it has prepared a more detailed tolling, financial and air analysis. It has prepared a Biological Assessment ("BA") regarding impacts on ESA species and MSA fisheries, it has added more detail to the FEIS and its appendices regarding impacts on species like salmon and it has consulted with NMFS regarding that analysis and NMFS has issued a BiOp. This new analysis, for the first time, discloses that the standard in-water work window designed to protect salmon will be suspended for much of the time the new proposed bridge is under construction. (This new disclosure and analysis by itself is enough to justify a Supplemental DEIS.) CRC has prepared a completely new and lengthy Metroscope 2010 modeling report that supposedly supports its assertions of no induced growth. A sustainability strategy has suddenly appeared as an appendix to the FEIS. FEIS Appendix C. New bridge designs were identified and evaluated in a lengthy report. *See* BRP Report, Non-NEPA Reports Folder. The CRC staff also made numerous changes to the DEIS alternatives when developing the LPA in the FEIS. Additional detail and changes from the DEIS are set forth in FEIS Changes, contained in the NEPA Process Folder. These are all just examples of the many

O-002-002

changes to the FEIS, and PEAC has simply not had enough time during the very limited FEIS 30-day comment period to identify and list all of those changes.

CRC has argued repeatedly at public hearings that all these changes are simply refinements to and added detail regarding the LPA and that such changes are normal between the DEIS and FEIS.[2] The Federal Agencies have prepared several "NEPA Determinations" finding that some of the design changes in fact do not have "significant impacts," and thus do not trigger the need for a SDEIS under section 1502.9(c).[3] There are at least two problems with these arguments and findings. First they ignore the fact that much of the newly added analysis and information has absolutely nothing to do with the specific changes made to the LPA. The DEIS was required to have a detailed analysis regarding, among other things, tolling, finances, induced growth, air impacts and impacts on threatened salmon. The delay in providing that detailed analysis (which in any case is still quite inadequate) has nothing to do with changes made to the LPA. Section 1502.25 required that this detailed analysis regarding threatened and endangered species, including the BA and BiOp, must, "to the fullest extent possible," be prepared and included in the DEIS. PEAC sees no valid explanation for putting off all this ESA and detailed NEPA analysis until the FEIS. Indeed the real explanation for this delayed analysis appears to be the CRC's choice to put out a cursory DEIS before sufficient planning and analysis had been done regarding the LPA and mitigation measures.

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[2] Far from being normal, these changes to the DEIS action alternatives were necessitated in part by a clear legal error by the CRC regarding what alternatives must be presented and evaluated in the DEIS. Then CRC Executive Director Brandman repeatedly stated, in response to criticism regarding the size and cost of the DEIS replacement bridge alternatives, that NEPA regulations required the CRC to develop DEIS alternatives without regard to cost. Brandman e-mail in NEPA Process Exhibits Folder, and Oregonian Traffic Estimates in Media Folder. There is, of course, no such regulation.

[3] Although these evaluations are prominently included with the FEIS, Appendix O, PEAC has not found the specific certification required by 23 C.F.R. § 771.129(a).

O-002-002

Second, the Federal Agencies' reports examine the various changes in isolation and do not really consider the cumulative impacts of all the changes and new information. When considered together, and in light of the incomplete and unsupported DEIS, all of these changes and new information clearly trigger the need for a SDEIS under 40 23 C.F.R § 1502.9(c) and 23 C.F.R § 771.130.

The Federal Agencies' decisions not to require a SDEIS also ignore new, very significant information regarding environmental impacts that most certainly had to be evaluated in a SDEIS. First, the new traffic data and expert evaluations criticizing the DEIS's traffic estimates show very real, significant effects that the FEIS simply ignores. *See generally*, INDIRECT IMPACTS—INDUCED GROWTH, TRAFFIC PROJECTIONS AND FINANCIAL ANALYSIS Exhibits Folder. By over-estimating future traffic over the I-5 bridge, the DEIS, and now the FEIS, seriously over-estimate the adverse impacts from the no action alternative and significantly overstate the supposed benefits from the proposed action alternatives. For purposes of the required alternatives analysis, and the required analysis of many other direct and indirect impacts like air emissions, such erroneous over-estimates are clearly significant impacts that the FEIS now fails to address and that the public should have seen in a SDEIS.[4] Second, when reevaluating the replacement bridge's design, that analysis disclosed, for the first time, that there are alternative bridge designs available that could have far fewer adverse impacts on salmon and other aquatic species. In addition, the Peterson alternative presented to the CRC in 2010 confirms that alternative designs are available that require far fewer in water piers and create less shade

[4] There is simply no legal basis for the assertions in several government reports downplaying these errors that such erroneous traffic estimates are "good enough" for NEPA (*see* OST Review in INDIRECT IMPACTS—INDUCED GROWTH, TRAFFIC PROJECTIONS AND FINANCIAL ANALYSIS Exhibits/Sources Folder) and that accurate or the best traffic estimates are only necessary for the financial analysis that will be prepared for prospective bondholders.

O-002-002

over the river. The Federal Agencies' NEPA and ESA responsibilities (see 40 C.F.R. § 1500.2 and 16 U.S.C. § 1536 (a)(1)) do not allow them to summarily dismiss such less harmful alternatives and those alternatives had to be presented to the public for its evaluation in a SDEIS. Under the ESA, it is not enough for the Federal Agencies to simply avoid jeopardy (and the BiOp and NEPA analysis in the FEIS do not even show that). The Federal Agencies had to at least acknowledge and consider alternatives—here bridge designs—that could actually enhance salmon habitat and increase the chances for recovery. See *Sierra Club v. Glickman*, 156 F.3d 606 (5th Cir. 1998). Instead, those designs appear to have been summarily dismissed primarily because of concerns about aviation use at Pearson field. Such concerns, even if valid, (and the bridge design report questioned those concerns, *see* BRP Report, Non-NEPA Reports Folder), are not enough to justify the CRC FEIS summarily choosing to put the interests of Cessnas ahead of salmon.[5] The public was entitled to a SDEIS with a complete analysis of the tradeoffs involved and the impacts of such choices and alternatives. Rather than considering such alternatives and other environmentally friendly changes in good faith, as NEPA requires, CRC and state officials publicly stated that they would only consider changes to their LPA that, at least arguably, would not require a SDEIS. *See* Bailey CRC Letter in NEPA Process Folder. Such an approach to NEPA analysis violates both the spirit and specific requirements of that statute and its implementing regulations.

Overall, the missing analysis in the DEIS, new analysis and changes in the FEIS that could have been put into the DEIS, the cumulative impacts of all the changes to the action alternatives, and the failure to address significant new information showing materially incorrect traffic

[5] Agencies must consider otherwise reasonable alternatives even though they would require action by another agency or even legislative action to change current law. *Envir. Defense Fund v. Froehlke,* 473 F.2d 346 (8th Cir. 1974); *Muckleshoot Indian Tribe v. USFS,* 177 F.3d 800, 814 (9th Cir. 1999).

O-002-002

forecasts and less harmful alternatives for salmon, all combine to trigger the need for a supplemental DEIS under 40 C.F.R. § 1502.9 and 23 C.F.R. § 771.130. Absent a SDEIS, the public will not have a meaningful opportunity to comment on all of this significant information and these significant impacts.[6] Indeed the federal agencies desire to avoid such public scrutiny is so determined that those agencies even rejected a request to give the public an additional 30 days to comment on the substantially changed and very lengthy FEIS. *See* FEIS Comment Extension and Denial of Extension in NEPA Process Folder. Apparently even though they are proposing to spend over $3 billion on the largest public works project in the history of Oregon and the largest in-water project in the Columbia River since salmon were listed under the ESA, an additional 30 days is just too much to ask.[7] Additional exhibits supporting these SDEIS Comments can be found in the Media Folder, the Non-NEPA Reports Folder, the NEPA Process Folder, and the Other Comments.

[6] Posting some of this information and analysis on its website or disclosing it at public meetings during the more than 3 years between the DEIS and FEIS is no substitute for the opportunity to comment as part of the official and required NEPA process. Until analysis appeared in or was incorporated into the FEIS the public had no way of knowing what analysis the CRC considered final and a part of the required NEPA analysis. For example, the Independent Review Panel went out of its way to assert that its findings and hearing were NOT part of the NEPA process. NEPA does not provide for or allow a "rolling evaluation." None of these interim documents or interim analysis was released as part of an arguably NEPA compliant document until they were expressly used by or incorporated into this FEIS, and agencies can only use such NEPA compliant documents to satisfy NEPA's requirements. NEPA requires a comprehensive EIS that gathers all of the relevant analysis and information in one place for public comment precisely to avoid such confusion and obfuscations regarding what is and is not final and relevant to the required NEPA evaluation.

[7] Indeed the Federal Agencies also rejected a request for additional time to comment on the DEIS. They rushed through the DEIS comment process and then took more than three years to finalize the FEIS. Apparently an additional 30 days for public comment is unreasonable but more than three years to revise an FEIS is reasonable.

Purpose and Need

O-002-003

The FEIS did not change the purpose and need statement from the DEIS despite many comments, from PEAC and others, that the purpose and need were improperly narrow. Nor did the CRC sufficiently respond to the genuine concerns presented in PEAC's comments. The purpose's scope is still geographically limited to the Bridge Influence Area (BIA) rather than focusing on broader transportation concerns between Portland and Vancouver. The purpose and need were not expanded to address the region's commitment to sustainable development but rather were maintained in a way that only allows alternatives that increase car capacity. The FEIS fails to analyze an adequate scope of project impacts due to a limited scope of review. The project purpose is unjustifiably limited to improving freight and traffic conditions along the I-5 freeway corridor, yet the north-south flow of traffic through the Portland-Vancouver metropolitan area is regional in nature, with an additional crossing along the I-205 freeway. By failing to consider regional alternatives, and therefore, regional impacts, the FEIS has insufficiently analyzed the ecological, health-based and cumulative impacts of the project. Given the crucial role that the purpose and need statement plays in directing the range of the alternatives, a fuller explanation of the decisions that went into the development of the purpose and need statement is necessary.

The CRC's responses to PEAC's comments were vague and unhelpful.

O-002-004

The CRC responded to a wide range of PEAC comments with a formulaic answer that did not adequately address PEAC's concerns. When an agency has decided to not take action in response to a comment, such as by modifying the proposed action, it must "explain why the comments do not warrant further agency response, citing the sources, authorities, or reasons which support the agency's position." 40 C.F.R. § 1503.4(a)(5). The CRC did not meet this

O-002-003

See below for responses to these and subsequent comments on purpose and need. Some of these comments are similar in content to the comments PEAC submitted on the DEIS. See the FEIS, Appendix P (CRC DEIS Comments) (on the CD included with the FEIS and with the FEIS Summary) for responses to PEAC's DEIS comments. Additional information is provided below.

O-002-004

Responses were provided directly to all comments received on the DEIS. Where the information in the EIS itself provided the requested information or explanation, the responses to comments referred to the EIS rather than repeating that text in the response itself. The FEIS includes information relevant to PEAC's purpose and need comments. Chapter 1 includes the purpose and need itself, as well as a description of how the purpose and need were developed (Section 1.2). Section 3.1 includes a more detailed discussion of the transportation needs that the project is intended to address. The following responses also provide more information relevant to the points raised in this comment.

O-002-004

standard of explanation but rather used a blanket response to concerns that ranged from the failure to integrate sustainability into the purpose to the claim that the purpose and need statement led to an inappropriately narrow range of alternatives. *See, e.g.,* responses 035-032; -036; -038; -041. The responses addressed this entire range of comments by claiming that the purpose and need were based on "extensive analysis." *Id.* However, the law requires a more detailed response that vague references to an analysis in order to demonstrate that the CRC truly considered the legitimate concerns raised in the comments.

Rather than providing helpful explanation, the CRC's responses contained circular and confusing logic. PEAC commented that a broader purpose and need statement is necessary in order to allow consideration of a wider range of alternatives. PEAC Comments at 27. In response, the CRC consistently stated that the initial assortment of alternatives was limited prior to the DEIS in order to meet the project's purpose and need, which are best met by a multimodal alternative including highway improvements. *See, e.g.,* Responses 035-029; -034; -42. This response does not address PEAC's concern but rather supports its argument that having a properly defined purpose and need is essential to the creation of an appropriate range of alternatives. Because the purpose and need is crucial to shaping the ultimate range of alternatives, there should be a detailed explanation of how they were developed, in order to allow true public evaluation of the process and decisions that produced the purpose and need statement.

The purpose and need were inappropriately focused on the BIA.

O-002-005

The CRC failed to explain or justify the narrow restriction of the purpose and need to concerns at I-5 river crossing. Rather, the responses refer to an "extensive analysis" of transportation problems identified in earlier studies. Responses 035-032; -036; -038; -041; -051. The only specific study cited in the responses is the Transportation and Trade Partnership Study

O-002-005

As discussed in the FEIS (Chapters 1 and 2), the I-5 Transportation and Trade Partnership studied transportation problems in the I-5 corridor between Portland and Vancouver, and in 2002 recommended specific projects and additional studies to address those problems. CRC was one of the projects identified (see Section 2.7.3 of the FEIS) to address a specific set of needs.

The project is not intended to address region-wide transportation needs; it is intended to address six needs in the I-5 corridor, as discussed in Chapter 1 of the EIS. The purpose and need, and the project itself, cover a wide range of transportation issues in a very problematic section of a significant corridor.

While the purpose and need focus on addressing issues primarily within the bridge influence area (BIA), the project considered a wide range of potential solutions, including actions well outside the BIA, during the early stages of the CRC study as well as in studies that preceded the CRC. The early screening of alternatives demonstrated that none of the alternatives that were outside the BIA could adequately address the project's purpose and need, and thus they were not carried forward into the DEIS. This is discussed in the FEIS as well as in responses to comments.

O-002-005

and Strategic Plan. Response 035-051. This study identifies the importance of the I-5 corridor and the need for improvements to meet growing demand and recommends a multimodal approach. PORTLAND/VANCOUVER I-5 TRANSPORTATION AND TRADE TASK FORCE, FINAL STRATEGIC PLAN 3- 4 (June 2002) in Traffic and Induced Growth Folder. However, the study does not explain the decisions behind the development of the purpose and need which were done by a separate agency at a separate time and the CRC cannot claim that the study restricts its ability to shape an appropriate purpose and need. The CRC must explain why the purpose and need were so narrowly focused on the BIA in order to allow a true evaluation of the process.

The CRC relied on this same "extensive analysis" to respond to PEAC's claim that the true purpose of the project was to increase car capacity. PEAC DEIS Comments at 20; Responses 035-032; -036. The responses recognized the importance of the purpose and need in shaping the range of analysis as the responses consistently justified highway improvements as necessary in order to meet the stated purpose and need. Because the purpose and need are so influential in directing the course of the project, how they were developed should be fully explained in order to ensure a thorough and impartial process. Merely referring to earlier studies and an extensive analysis is insufficient because that only describes the process through which the purpose and need were narrowed not the actually decisions behind the final purpose and need statement or any justifications for its narrow scope.

The purpose and need statement ignores the region's deep commitment to sustainable development.

O-002-006

PEAC commented that the purpose and need were focused narrowly on increasing car capacity and thus failed to reflect the strong state, local, and community support for sustainable development. PEAC Comments at 21. The CRC did not specifically address why sustainability was not included in the purpose and need but merely discussed how projects that did not include

O-002-006

Sustainability is one of many regional public policy goals; that alone does not warrant it being included in the stated purpose and need for this proposed action. Sustainability issues (related to community, the environment, and financial considerations) were reflected in the CRC project Vision and Values, and included in the evaluation criteria used to determine which options and alternatives would be advanced to the DEIS, as discussed in Chapter 2 of the FEIS. While the project does aim to promote sustainability principles, and has developed a Sustainability Strategy, sustainability is not among the fundamental needs for this project.

Regarding vehicle miles travelled (VMT) and greenhouse gases (GHG) in particular, analysis in the FEIS demonstrates that the LPA would reduce regional VMT and GHG emissions compared to No-Build. Regional VMT is reduced as a result of mode shift to transit and the elimination of some trips due to highway tolling. The reduction in congestion on I-5 also shortens some trips that would otherwise use the longer I-205 route to avoid the I-5 congestion, although this is partially offset by trips that divert to I-205 to avoid the toll on I-5, as discussed in Section 3.1 of the FEIS. GHG emissions are reduced as a result of mode shift to transit, the elimination of some trips due to highway tolling, and the reduction in congestion on I-5. There is no requirement that the EIS evaluate alternatives that reduce GHG emissions below current levels. The project is included in the Portland area's Regional Transportation Plan (RTP) and the Vancouver area's Metropolitan Transportation Plan (MTP), and is in both state transportation improvement programs.

O-002-006

highway improvements did not meet the purpose and need.[8] This response emphasized again the importance of having a properly defined purpose and need in order to develop a true range of alternatives. Responses at 035-038; 041 (stating that a multimodal approach best meets the project's purpose and need). Failing to include the region's commitment to sustainable development in the purpose and need statement meant that, from the outset of the project, alternatives would be biased toward increasing car capacity rather than proactively moving the region toward meeting its emission reduction goals. If the purpose and need had recognized sustainable development as an essential purpose of the project, more innovative and environmentally low impact projects could have been evaluated as alternatives.

The CRC also failed to respond to how the narrow purpose and need led to a selection of alternatives that did not include an option that would actively reduce vehicle miles traveled (VMT) and greenhouse gas emissions. Rather, the CRC argued that there is "no requirement that any action by itself reduce future emissions and that broad reductions only come from a wide variety of actions" and that a build alternative is a step in the right direction. Response 035-037. While there is no requirement that a single project *by itself* reduces future emissions, a project of this scale and investment must at least contribute to the regional sustainability and climate change goals. Transportation is a major source of emissions and the CRC crossing is currently the region's most significant and expensive transportation project. Every alternative presented in the FEIS only reduces emissions below the no-build, business-as-usual scenario, and does not proactively reduce emissions. This is not consistent with the regional goals of mitigating climate

[8] The CRC staff did include a new "Sustainability Strategy" with the FEIS. FEIS, Appendix C. This approach to sustainability is the equivalent of buying a Hummer and then insisting that you will drive it "sustainably." The new CRC "strategy" is an interesting exercise in creative writing, but this post hoc (post-alternatives analysis) action is no substitute for making sustainability an important part of the CRC's purpose and need statement.

O-002-006 change by reducing VMT and GHG emissions by 75 percent from 1990 levels by 2050. In order to explore the relationship and trade-offs between increasing car capacity and increasing VMT and emissions levels, a viable alternative should have been evaluated that actively decreased emissions and VMTs, such as a plan that focuses on decreasing car use through tolling, transit investments, and adjusting regional transportation management. By narrowly restricting the purpose to focus on congestion in the I-5 corridor, viable alternatives that could truly decrease emissions and VMT were excluded without true consideration.

The purpose and need statement inappropriately limits the range of alternatives.

O-002-007 Federal agencies must include in an EIS a statement that "briefly specif[ies] the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action." 40 C.F.R. §1502.13. The required purpose and need statement is critical because it determines the scope of reasonable alternatives. *See Nat'l Parks & Conservation Ass'n v. BLM,* 586 F.3d 735, 746 (9th Cir. 2009); *Simmons v. U.S. Army Corps of Engineers,* 120 F.3d 664, 666 (7th Cir. 1997) (noting that "[o]ne obvious way for an agency to slip past the strictures of NEPA is to contrive a purpose so slender as to define competing 'reasonable alternatives' out of consideration (and even out of existence)"). In evaluating a claim that an agency failed to consider a reasonable range of alternatives, "a court begins by determining whether or not the Purpose and Need Statement was reasonable." *Westlands Water Dist. v. U.S. Dept. of Interior,* 376 F.3d 853, 865 (9th Cir. 2004).

The CRC's responses never refuted that the narrow purpose and need statement led to an inadequate range of alternatives. Rather, the responses merely asserted that the alternatives were created by an "evaluation and screening of a wide array of possible solutions" which revealed that capital improvements were necessary within the I-5 corridor in order to meet the purpose and need. Responses 035-029; -034; -042; -45; -047; -048. This response did not demonstrate

O-002-007

The DEIS and FEIS considered a wide array of improvements, including significant light rail transit improvements, highway improvements, bicycle and pedestrian improvements, tolling, and other TDM/TSM measures. The LPA includes all of these elements. The purpose and need allowed for a wide range of potential solutions to meet the various needs. For example, the test of whether or not certain types of components could meet the congestion-related need allowed flexibility in how it could be met. Components could either "increase vehicular capacity or decrease vehicular demand" to meet the congestion- and mobility-related needs, as described on page 2-72 of the FEIS. See all of section 2.5 of the FEIS and the responses to your comments on the DEIS. See also the responses above and below regarding the range of alternatives evaluated.

O-002-007 that the alternatives were adequate, but supports the argument that drawing the purpose and need too narrowly results in the inappropriate exclusion of disfavored ideas and concepts. Here, by focusing the purpose and need solely on increasing mobility in the I-5 BIA, many alternatives that would have less environmental impact while still relieving congestion were rejected out of hand. The CRC cannot write off the crucial interaction between the purpose and need and the range of alternatives by referring to vague screening processes. It must acknowledge and explain why the purpose and need were drawn so that the only alternatives, from a very wide initial array, focused exclusively on highway improvements that would increase car capacity.

The CRC failed to justify the impermissible narrow range of alternatives evaluated in the DEIS and FEIS.

O-002-008 The range of alternatives in the DEIS and FEIS was not reasonable and only presented an extreme choice between expensive build options and the untenable no-action, do nothing alternative. PEAC Comments at 28-31. The CRC did not respond to this comment but only insisted that alternatives that did not include highway improvements did not meet the project's purpose and need, specifically traffic congestion and safety problems. Response 035-042. These conclusory statements were insufficient explanation of why certain alternatives were dropped from a full evaluation in the DEIS and FEIS.

Rather than explaining the justification for dropping certain aspects of the project the responses only mention vague "analyses and input" that indicated certain alternatives would not meet the project's purpose and need. Response 035-042. The response referred the reader to Appendix C of the DEIS for a more thorough explanation of the early screening process. This two-page document explains the process that components went through and includes a conclusory chart showing which early components failed the six pass/fail screening questions. However, this document does not contain any analysis or explanation for why certain

O-002-008

Please see the response to comment O-002-007 above.

O-002-008

components were deemed to have failed these threshold questions. NEPA requires that both conclusions and the underlying analysis appear in the EIS.

The Development of Alternatives Memo suffers from the same problems of superficial analysis rather than actual discussion. Response 035-053. The document identifies that its purpose is to "briefly summarize the process" through which the alternatives were developed. COLUMBIA RIVER CROSSING, DEVELOPMENT OF THE RANGE OF ALTERNATIVES MEMO [MEMO] 1 (June 2007) in Alternatives Folder. True to its word, the memo focuses entirely on process, rather than in-depth discussion of why the range was so restricted. *Id.* at 3 (noting that "analysis revealed" in Attachment G that the replacement bridge was the best option). The analysis contained in Attachment G to the Memo, titled Component Findings, only evaluates 12 option packages that combined a supplemental or replacement bridge with different transit options. *Id.* Thus, the only explanation for the early dismissal of other options, such as opening up a new corridor or improving I-205, is the checklist in Appendix C. This is simply inadequate to explain the limited options the CRC evaluated in the DEIS and FEIS.

The DEIS and FEIS should have included a fuller range of alternatives in order for the public to truly examine the pros and cons and trade-offs of different potential solutions. The decision to focus exclusively on build alternatives that involved massive new bridge construction meant that the CRC failed to evaluate a full range of alternatives as required by NEPA and inadequately justified this limited range. NEPA requires that an EIS must consider a reasonable range of alternatives. 40 C.F.R. §1502.14. This analysis is the "heart" of the NEPA process, *Center for Biological Diversity v. U.S. Dept. of Interior,* 623 F.3d 633, 642 (9th Cir. 2010), and the federal agencies must "rigorously explore and objectively evaluate *all* reasonable alternatives." 40 C.F.R. §1502.14(a) (emphasis added); *Muckleshoot Indian Tribe v. USFS,* 177

O-002-008

F.3d 800 (9th Cir. 1999). "The existence of reasonable but unexamined alternatives renders an EIS inadequate." *Friends of Southeast's Future v. Morrison,* 153 F.3d 1059, 1065 (9th Cir. 1998). While NEPA does not require a specific number of alternatives,[9] "[a]n agency must look at every reasonable alternative, with the range dictated by the nature and scope of the proposed action, and sufficient to permit a reasoned choice." *Alaska Wilderness Recreation & Tourism Ass'n v. Morrison*, 67 F.3d 723, 729 (9th Cir. 1995).

The CRC did not explain why it excluded discussion of available alternatives with less environmental impact.

O-002-009

In both the DEIS and FEIS, the CRC only considered options that increased highway capacity. It did this despite being presented with viable alternatives that were both cheaper and had potentially less environmental impact. The CRC did not attempt to honestly evaluate these options but merely responded that other alternatives had been dropped in the early stages of the screening process. *See, e.g.*, Responses 035-042; 004-011; 004-016; 034-005.[10] Rather than just issuing conclusory rejections of these alternatives, the CRC, consistent with 40 C.F.R. § 1500.2, should have honestly considered these options' impact on the environment and compared that with the replacement and supplement bridge alternatives. These or similar low-impact alternatives should be evaluated in a SEIS so that the public can compare these options to the LPA and comment on the different approaches.

The CRC was aware of the following sophisticated alternatives:

a. The Association of Oregon Rail and Transit Advocates had developed a detailed, phased approach to addressing the project's purpose and needs. See attachments to AORTA

[9] 42 U.S.C. § 4332(2)(C); 40 C.F.R. § 1502.14; *Native Ecosystems Council v. USFS,* 428 F.3d 1233, 1246 (9th Cir. 2005).

[10] The CRC cannot dismiss or refuse to consider options that include tolling the existing bridges and I-205. Either the FHWA of Congress could approve such an option, and an agency must consider options that would require a change in the law or other agency action. *See id.*

O-002-009

A wide variety of components, proposals, and other ideas were proposed and considered. Proposals that did not meet the fundamental needs for the project were not reasonable and did not need to be further evaluated. For example, the AORTA alternative had many elements in common with ideas that had already been evaluated--and dropped--prior to the DEIS because they could not meet the purpose and need and/or had significant feasibility problems. The "Straight Alternative" emerged after the DEIS and had some concepts similar to previously evaluated ideas, as well as some unique elements. The Bridge Expert Review Panel reviewed the "Straight Alternative" and did not recommend that CRC advance it. The CRC staff also reviewed it and found that it had substantial performance deficiencies, additional constructibility issues, and additional impacts, as outlined in an August 25, 2011 memorandum from Frank Green and Casey Liles to Nancy Boyd, CRC Project Director.

O-002-009

Comments; www.aortarail.org/. The approach would likely be cheaper overall and allow for continuing evaluation of the impact of gradual improvement. The proposed steps are: 1. Fix the rail bridge, which will decrease the use of the I-5 drawbridge and decrease the number of lifts by 95%. 2. Construct multi-modal bridge to Hayden Island. 3. Construct a new bridge for commuter trains, intercity trains, car, bikes and pedestrians that would open up more track capacity for freight trains. Correct Mill Plain and Marine Drive to allow trucks to bypass I-5. Enhance commuter rail between Vancouver and Union Station in Portland. This new bridge could be located far from Pearson Field so that it could be a suspension bridge design without piers in the water. 4. Upgrade the I-5 bridges to current seismic standards. 5. Build a new bridge between Hayden Island and Vancouver.

AORTA's well thought out plan was dismissed in the responses by claiming it did not meet the project's purpose and need. *See, e.g.*, response 034-005. This assertion is a conclusion not a discussion. The Development of the Range of Alternatives Memo referred to only evaluated a small range of options after more than half of the components had been removed due to early screening. MEMO at 3.

b. The CRC also failed to adequately address the recommendations of the Portland Pedestrian Advisory Committee that were aimed at limiting environmental impacts and enhancing the urban landscape. PAC's recommendations included: providing HOV or truck lanes to access port facilities, encouraging long distance freight use of I-205, capping the number of lanes at 4, expanding the light rail options, using congestion pricing as the primary means of regulating traffic flow, including both light rail and express buses, including traffic calming elements in the design, reducing lane widths, adding a local street along the Columbia, increasing bike and pedestrian network connectivity, and creating world class bike and

O-002-009

pedestrian routes. PAC Comments at 6-10. The CRC's responses did not show that the CRC seriously considered these options but reveal the same assumptive attitude that focused on highway construction. Response 004-011; 004-016. The CRC cannot simply ignore low-impact alternatives without presenting thorough analyses to the public. [11]

c. A third viable lower-impact alternative was presented to the CRC by Kevin Peterson, an accomplished bridge architect, which at least appears to meet the project's purpose and need statement. *See* Peterson Alternative Folder. This plan proposes a straight alignment bridge with a four lane collector-distributor serving Marine View Drive, Hayden Island and the SR-14 interchanges on a separate lower level below six lanes of thru traffic on the upper deck. *Id*. This new bridge would be place upstream of the existing I-5 bridges rather than the current downstream replacement bridge being suggested. This upstream alignment would allow for different bridge designs, such as a cable suspension bridge. Light rail transit and a bike and pedestrian pathway are included in the design, with the possibility of adapting the through lanes on the upper deck to light rail or high speed transit at a later time because of the straight alignment and the lack of cars merging onto the upper decks.

The potential benefits of this alternative include a substantially reduced footprint and less use of urban land, greater safety benefits by not having local traffic merge into interstate traffic, ability to expand transit options in the future, the potential to avoid piers in the water, and lower costs. *Id*. The potential benefits of this plan are extensive suggesting that the proposal deserved detailed review and should have been presented to the public. Indeed the potential that this

[11] The CRC's Executive Director told Metro and the Portland City Council that even measures to maximize use of the light rail line that is a part of the LPA would be "outside the scope" of the project. See attached videotape of 1/26/09 Hearing, NEPA Process Folder. Thus highway expansion rather than other transportation options was the clear and primary focus of the LPA and CRC's "alternatives analysis."

O-002-009

proposal has to reduce impacts on environmental justice communities, on Hayden Island and on Vancouver communities and to reduce impacts on salmon legally required that it be thoroughly and publicly analyzed. The CRC instead appears stubbornly wedded to traditional highway construction and unwilling to rigorously analyze more innovative solutions.

The CRC must develop an alternative that proactively reduces the factors, such as emissions, contributing to climate change.

O-002-010

PEAC and other groups commented that an alternative should have been presented that proactively reduced climate change factors, such as emissions and VMTs, given the region's commitment to reducing emissions. PEAC Comments at 33; Portland Planning Commission Comments at 9; Sustainable Development Commission at 2. Given that cars are a major source of emissions, a viable alternative should have been presented that reduced future emissions from current levels, not just from a future no-build, business-as-usual scenario. This would allow the public and agency to evaluate a side-by-side comparison of the different alternatives and compare the trade-offs present in each scheme.

The CRC failed to adequately respond to this assertion, using the same formulaic response that alternatives that did not involve highway construction failed to meet the project's purpose and needs. Response 035-045. It further claimed that the DEIS and FEIS demonstrated that the project would not increase greenhouse gas emissions. Response 035-044. This ignores the point that not increasing emissions is not the same as an alternative that would actively reduce emissions, such as one that involved larger investment in transit or other methods of reducing single occupancy vehicle use. Given the region's ambitious emission goals and public interest in climate change, an option should have been presented that moved the region toward meeting these goals.

O-002-010

Please see the response to comment O-002-006 above.

Regarding project design speed, it is 60 mph through most of the project, including the river crossing, and 70 mph for the Oregon section south of Hayden Island. Design speeds are lower on ramps. Significantly lower design speeds on the mainline would not be appropriate for an interstate highway and would have only minimal reductions in property acquisitions. The posted speed for the mainline is expected to be 60 mph or less, which is within the range of high fuel efficiency speeds for most vehicles.

O-002-010

The CRC also disregarded arguments about decreasing design speeds, asserting that increased design speeds reduce congestion and thus emissions. Response 035-004. It also noted that design speed is different than actual posted speed, which will remain lower. Response 035-040. However, this does not justify the fact that having higher design speeds necessitates a larger structure with the resulting environmental and community impacts and that reducing speeds is another way to reduce emission levels distinct from reducing VMTs. In the middle of a congested urban area, it is logical to design a bridge at a lower design speed potentially resulting in a smaller structure, decreased emissions, and safer conditions. The CRC should not have cursorily rejected a lower design speed but must seriously evaluate the benefits of a reduced speed and a resulting smaller footprint fro the project. ODOT and WashDOT clearly prefer a massive, sprawling structure that is simply not appropriate for densely populated urban areas. But the preferences of those highway agencies should not dictate the full range of alternatives presented in the EIS. But that appears to be exactly what happened here.

The CRC must develop an alternative that does not include highway construction.

O-002-011

A full range of alternatives should have included at least one option that did not include highway construction. PEAC comments at 36. Components that could have been combined to produce this alternative include increased transit, increased TMD/TSM, improvements to the rail bridge, tolling, strengthening the current bridge to meet seismic standards, and other structural or non structural solutions in the region. Additional options include a land use alternative where congestion is addressed through land transformation, such as having people work and live in close proximity. It is possible that a combination of these could satisfy the project's purpose and

O-002-011

Alternatives that did not involve highway construction were included in the early stages of alternatives analysis and screening. They were dropped from further evaluation when it became clear that they could not adequately address the project purpose and need. The EIS only includes alternatives that can meet the purpose and need, as discussed in Chapters 1 and 2 of the DEIS and FEIS. An alternative based on solely on land use controls intended to have "people work and live in close proximity" would also, by itself, not address the purpose and need. The region already promotes jobs/housing balance and has robust growth management, as discussed in Chapter 3. These land use policies are assumed in the No-Build and the build alternatives.

Transit, tolling, and other TSM/TDM measures were incorporated into the alternatives that were evaluated in the EIS, including the LPA. See Section 2.7 of the FEIS, and the responses to related comments on the DEIS, for further discussion.

O-002-011

need but the CRC did not ever evaluate these components in combination instead inflexibly insisting that alternatives that do not include highway improvements did not meet the project's purpose and need. *See, e.g.*, response 035-042. The CRC's intransigence prevented the consideration of more creative, innovative solutions. At the very least, a more complete range of alternatives would allow a more accurate comparison of the trade-offs involved in the different projects.

By focusing exclusively on the BIA, the range of alternatives did not evaluate the I-5 CRC project in the context of regional transportation. The DEIS and FEIS failed to evaluate how the alternative would impact the regional transit network or redistribute congestion problems. Merely shifting traffic and congestion would not serve the Portland and Vancouver communities or through freight carriers. More consideration should have been given to changes outside the I-5 corridor that could impact congestion in the BIA. For example, simultaneous investment in other routes between the Portland and Vancouver areas, mainly the I-205, should have been evaluated. These options were excluded from thorough consideration through a screening process that was not adequately explained or justified. Overall, the CRC presented a range of alternatives that precluded the discussion of more innovative solutions that could have addressed broader regional transportation concerns by consistently averring the necessity of highway improvements. The CRC must go back and provide greater analysis of a wider range of alternatives and more explanation of its decision-making process.

The FEIS Does Not Provide the Alternatives Analysis Required for a CWA 404 Permit.

O-002-012

The FEIS suggests that it may be used by the U.S. Army Corps to evaluate the CRC's future application for a Section 404 permit under the Clean Water Act. In performing its substantive review of an application, the Corps would be required to undergo a "public interest

O-002-012

Compliance with the alternatives analysis requirement for Clean Water Act 404 permits will be documented as part of the Section 404 permitting process, expected to occur in 2012.

O-002-012

review," which requires a determination of the "extent of public and private need for the proposed work," "the practicability of using reasonable alternative locations and methods to accomplish the objective of the proposed ... work," and "the permanence of … detrimental effects." 33 C.F.R. §§ 320.1(a)(1), 320.4(a)(2)(i)-(iii). In making these determinations, the Corps must consider "[a]ll factors which may be relevant to the proposal," including "the cumulative effects" of the project. 33 C.F.R. § 320.4(a)(1). In reviewing a Section 404 application, the Corps must also follow rules developed by EPA under Section 404(b) of the CWA, 33 U.S.C. § 1344(b), which are known as the "404(b)(1) Guidelines." 33 C.F.R. § 320.4(a). The 404(b)(1) Guidelines are codified at 40 C.F.R. Part 230. The Corps is prohibited from issuing any permit if, among other requirements:

> (i) There is a practicable alternative to the proposed discharge that would have less adverse effect on the aquatic ecosystem, so long as such alternative does not have other significant adverse environmental consequences; or
>
> (ii) The proposed discharge will result in significant degradation of the aquatic ecosystem … ; or
>
> (iii) The proposed discharge does not include all appropriate and practicable measures to minimize potential harm to the aquatic ecosystem; or
>
> (iv) There does not exist sufficient information to make a reasonable judgment as to whether the proposed discharge will comply with these Guidelines.

40 C.F.R. § 230.12(a)(3).

Where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge that do not involve a discharge to the special aquatic site "are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise." 40 C.F.R. § 230.10(a)(3). The FEIS does not come close to providing the necessary information to satisfy these requirements for a 404 permit application.

CUMULATIVE IMPACTS

O-002-013

This section of PEAC's comments focuses on the FEIS' general discussion of cumulative impacts, FEIS 3-429 to 3-460, and its related technical report. Other sections of this comment address other resource specific cumulative impacts issues, such as the significant omissions regarding cumulative impacts in the FEIS' discussion of impacts to threatened salmonid species.

NEPA documents must "provide full and fair discussion of significant environmental impacts." 40 C.F.R. §1502.1. Agencies must "consider every significant aspect of the environmental impact of a proposed action," *Ore. Natural Desert Ass'n v. BLM*, 625 F.3d 1092, 1100 (9th Cir. 2010), which includes the cumulative effects of a proposed action. *See* 40 C.F.R. §1508.25(c)(3). A "cumulative impact" is "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. 40 C.F.R. 1508.7. "Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." *Id.* A proper consideration of the cumulative impacts of a project requires "some quantified or detailed information; ... [g]eneral statements about possible effects and some risk do not constitute a hard look absent a justification regarding why more definitive information could not be provided." *Ocean Advocates v. U.S. Army Corps*, 361 F.3d 1108, 1128 (9th Cir. 2004)(*amended opinion*, 402 F.3d at 868). The analysis "must be more than perfunctory; it must provide a useful analysis of the cumulative impacts of past, present, and future projects," *Kern v. U.S. Bureau of Land Mgmt.*, 284 F.3d 1062, 1075 (9th Cir. 2002), and explain "how [] individual impacts might combine or synergistically interact with each other to affect the [] environment." *Klamath-Siskiyou*

O-002-013

The FEIS Section 3.19 and the Cumulative Impacts Technical Report address cumulative impacts for the project. For resources where the project would clearly have positive impacts, such as with the clean-up of existing hazardous materials, extensive discussion was not warranted. In cases where the project contributes to an existing and growing problem, such as climate change or declining salmon runs, greater detail was provided, even when the project has fewer impacts than the No-Build Alternative.

Regarding the geographic scope of the cumulative impacts analysis, the scope was not limited to the bridge influence area (BIA) or any other single geographic area. Rather, the geographic scope differed based on the resource in question. For example, the cumulative impacts of climate change is largely based on a global phenomena and the cumulative impacts on aquatic species included an analysis of impacts to affected fish runs, including an in-depth discussion of the primary drivers of fish health in the entire Columbia River basin--such as the hydropower and hatchery systems that extend outside the BIA.

Regarding the Bradwood LNG project, CRC staff was aware that the previous Bradwood proponents had ceased pursuing it in 2011 while we were preparing the CRC FEIS. However, we chose not to remove it from the cumulative impacts analysis because the likelihood of a new proponent coming forward to take advantage of that site or another similar site seemed reasonably foreseeable. From a cumulative impacts perspective, the impacts of the Oregon LNG proposal in Warrenton would be very similar to those considered from the Bradwood LNG project in the CRC cumulative impacts analysis.

The impacts from CRC construction on fish and other aquatic species are discussed in Section 3.16 of the FEIS and in the Ecosystems Technical Report. The cumulative impact analysis in Section 3.19 does

O-002-013

Wildlands Ctr. v. BLM, 387 F.3d 989, 997 (9th Cir. 2004). Under NEPA, the federal agencies must to take a "hard look" at significant environmental consequences. *Kern*, 284 F.3d at 1066. "A 'hard look' does not dictate a soft touch or brush-off of negative effects." *Native Ecosystems Council v. USFS*, 428 F.3d 1233, 1241 (9th Cir. 2005).[12]

The Ninth Circuit has underscored the importance of cumulative impact analysis. *See Kern*, 284 F.3d at 1076 (EAs require "adequate consideration of cumulative effects" and must be addressed "fully"). This is particularly true in an EIS, which "more thoroughly than an EA, [explores] the environmental consequences of a proposed action." *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1216 (9th Cir. 1998). The burden on a commentor to demonstrate inadequate cumulative impacts analysis is a low one, *Te-Moak Tribe of Western Shoshone of Nevada v. U.S. Dept. of Interior*, 608 F.3d 592, 605 (9th Cir. 2010), not even requiring that commentor to specify a particular project implicating cumulative impacts. *See, e.g., City of Carmel-By-The-Sea v. U.S. Dept. of Transp.*, 123 F.3d 1142, 1161 (9th Cir. 1997). PEAC need "show only the potential for cumulative impact." *Te-Moak Tribe*, 608 F.3d at 605.

When PEAC looked for a cumulative effects "analysis" that satisfies the Ninth Circuit case law in the "cumulative effects" section of the FEIS and its "Cumulative Effects Technical Report, " PEAC discovered (quoting Gertrude Stein) that "there is no there there." The FEIS's cumulative impacts "analysis" violates virtually every requirement for such analysis set out in the Ninth Circuit's case law. In this section of the FEIS, FEIS 3-429 to 3-460, the reader finds a series of conclusory assertions about no or limited cumulative impacts. The "analysis" simply

[12] Although a proposed action's impact may be minor, combined actions over time may be significant. 40 C.F.R. § 1508.7. Analysis must address combined or synergistic effects in addition to isolated effects. *See Klamath-Siskiyou Wildlands Ctr. v. BLM*, 387 F.3d 989, 997 (9th Cir. 2004). Analysis must be based on quantified or detailed information rather than vague or general statements about possible effects. *Ocean Advocates v. U.S. Army Corp of Engineers*, 361 F.3d 1108, 1128 (9th Cir. 2004) (*amended by* 402 F.3rd 846 (9th Cir. 2005)).

not repeat that text but does consider the project's impacts in the context of other past and reasonably foreseeable impacts. NMFS also considers cumulative impacts to threatened and endangered species as part of the ESA Section 7 process, and in its Biological Opinion and determination regarding incidental take. As discussed in the Ecosystems Technical Report and Section 3.16 of the FEIS, the project has sought to avoid and minimize impacts to the greatest extent practicable, and for those construction impacts that cannot be avoided, mitigation was proposed.

O-002-013

lists other projects with potential cumulative effects but makes no attempt to analyze or quantify such effects in any way. Other than an occasional general citation to a "technical report", the "analysis" cites nothing to support its repeated conclusory assertions about limited or no cumulative impacts. And when the public goes to the Cumulative Effects technical report, remarkably it is similarly devoid of specific citations to research or other analysis to support its assertions. What is the point of preparing a "technical report" that cites no technical information? This lack of cited support violates the above-cited case law and 40 C.F.R. § 1502.24.

Several statements in the cumulative effects "analysis" merits special attention. This section of the FEIS repeatedly refers to the "CRC project area." *See, e.g.,* FEIS at 3-429. The term is undefined and it is unclear how that area differs from the BIA. The technical report compounds this confusion by using the term "study area." Overall the geographic scope of the cumulative effects analysis is completely unclear. Although the Bradwood LNG proposal is discussed, apparently the CRC staff is unaware that in March of 2011 the Ninth Circuit vacated FERC's license issued to Bradwood. However, another LNG proposal for a terminal on the Columbia River, Oregon LNG, is moving forward and that proposal is not mentioned in the FEIS. The FEIS asserts that tolling will have "no negative impacts" on low-income populations. FEIS at 3-436. That assertion is completely unsupported and is in fact simply outrageous.

Perhaps the single most significant omission from the cumulative impacts discussion is the total failure to mention the impacts from construction activities on aquatic species, including the impacts when construction continues outside the in water work window. Years of in-water work, including substantial periods of work outside the protective in-water work window, will have significant cumulative impacts on aquatic species including all the species of threatened salmon. The analysis also erroneously asserts that the LPA, once constructed, would have the

O-002-013

same adverse impacts on salmon. In fact the LPA would have much larger in-water piers, and would cast a much larger shadow on the river, and would create many more acres of impermeable surfaces and their associated storm water run off. It will be one more large obstacle that migrating salmon must maneuver under and around, and the FEIS fails to discuss how the cumulative impacts of the ever increasing number of such obstacles in the Columbia and Willamette Rivers and how such repeated additions to and degradations of salmon is consistent with the federal agencies' responsibilities under sections 7(a)(1) and (2) of the ESA.

DIRECT IMPACTS—AIR, WATER, AQUATIC SPECIES, and ENVIRONMENTAL JUSTICE/COMMUNITY/PUBLIC HEALTH IMPACTS

WATER QUALITY

O-002-014

The FEIS water quality section, like the water quality section in the DEIS, fails to provide the public with essential basic information about the project.

One of the primary purposes of an environmental impact statement is to "provide full and fair discussion of significant environmental impacts" that "inform[s] decisionmakers and the public."[13] Where an EIS fails to provide basic information about a proposed project that is essential for decisionmakers and the public to make an informed decision about the project, it fails to meet the requirements of NEPA and its implementing regulations. The CRC FEIS has failed to provide important information to the public in a number of circumstances. This puts the burden on the public to seek out relevant information needed to come to conclusions and meaningfully comment on the proposed project.

The FEIS water quality section fails to adequately quantify the total number of acres of impervious surfaces created by the project. On this point, the FEIS continually hides the ball. Exhibit 3.14-4 indicates the amount of pollutant generating impervious surfaces (PGIS) that will

[13] 40 C.F.R. § 1502.1.

O-002-014

Section 3.14 of the FEIS discusses the water quality conditions and proposed treatment in adequate detail for the FEIS. Additional technical information is provided in the Water Quality and Hydrology Technical Report and Appendix A (Stormwater Management Memorandum). The commenter notes the addition of both pollutant-generating impervious surfaces and non-pollutant-generating impervious surface throughout the project area.

The FEIS and its technical reports and appendices discuss the use of water quality treatment scenarios and provide results of models tailored to roadway projects and their runoff. The use of the WSDOT-FHWA model is summarized on page 3-341 of the FEIS and discussed in further detail on page 4-6 of the Water Quality and Hydrology Technical Report. This discussion is refined in the technical report errata. As summarized on 3-341 and 3-342 of the FEIS, LPA Option A would increase total impervious surfaces by 42 acres from approximately 239 acres currently. Of these 42 acres, only 28 acres are anticipated to be pollutant-generating, with the remainder being surfaces such as bike/pedestrian and LRT facilities. Therefore, although an increase of 11 percent of pollutant-generating impervious surface would occur, a decrease of untreated stormwater runoff would also occur, from approximately 219 acres to zero. The analysis using the available models and the discussion associated with stormwater treatment BMPs (in the Appendix to the Water Quality and Hydrology Technical Report) show that overall pollutant loading will decrease and that stormwater treatment will treat at least 80 to 90 percent of annual runoff. The project has committed to increasing that treatment rate wherever practicable, and is required in Washington to treat 91 percent of annual runoff (page 4 of Appendix A of the Water Quality and HydrologyTechnical Report). The BMPs proposed for stormwater treatment are designed specifically for treatment of roadway runoff and are effective in reducing sediments, particulates, and dissolved metals (Page 10 of Appendix A of

O-002-014

be created. The provided estimate of the proposed increase in total impervious (PGIS and non-PGIS) area is approximately 42 acres.[14] However, this estimate does not include all areas that may create impervious surfaces.[15] Further, Exhibit 3.14-4's claim that the untreated PGIS area will drop from 219 acres under the no-build alternative to zero for the LPAs seems to be directly contradicted in the Water Quality and Hydrology Technical Report.[16] These inconsistencies fail to disclose to the public essential information about the actual impacts of the proposed project as required by NEPA.

In addition, the FEIS makes a distinction between the amount of contributing impervious area (CIA) created, which presumably includes PGIS and non-PGIS, and PGIS created. This distinction helps to obscure the total amount of impervious surface created by the proposed project. The distinction is also relevant in considering how much of the runoff from impervious surfaces will be treated before entering receiving waters. Oregon law requires more than just runoff from PGIS be treated, while Washington law limits the required treatment.[17] The FEIS does not clearly resolve whether Oregon standards for treating runoff from impervious surfaces will be met in all areas, or if Washington standards will be applied in some instances.[18]

The FEIS Water Quality and Hydrology Technical Report fails to provide specific citations to relevant sources that support the report's assertions. A general reference section is provided in the technical report and occasionally sources from that reference section are generally cited in the report's text. However, this is not sufficient to allow members of the public to determine when and how sources are used to support the assertions in the FEIS and

[14] FEIS at 3-341 to 3-342.
[15] *See e.g.*, FEIS at 3-341 (not including TriMet's Ruby Junction Maintenance Facility).
[16] Water Quality & Hydrology Technical Report for the FEIS, at 1-13 ("[U]ntreated PGIS would be reduced from the current 219 acres to approximately 8 acres for both LPA options.")
[17] Water Quality & Hydrology Technical Report for the FEIS, at 1-13.
[18] *See id.*

the Water Quality and Hydrology Technical Report). Where high concentration of oils and greases are anticipated, oil control pretreatment may also be required for proper operation of stormwater BMPs (Page 10 of Appendix A of the Water Quality and HydrologyTechnical Report).

The stormwater BMPs were chosen based on a multi-agency effort associated with both states' Departments of Transportation and relevant regulatory agencies. As MS4 permit holders, ODOT and WSDOT work with DEQ and Ecology, respectively, to determine appropriate treatment measures to ensure water quality in receiving waters. Thus, through use of the BMPs identified, the project team is confident that proper treatment for pollutants was adequately addressed in the FEIS. Final design of stormwater facilities cannot occur until near-final design of the project elements flowing into the facilities is complete.

As noted, further discussion with DEQ and Ecology will occur during permitting to address any concerns on water quality.

O-002-014

technical reports. Some 42 references are provided for the water quality technical report alone, leaving the public with the onerous task of reading through all the references to determine which might support any given portion of the technical report. Even where general citations are provided, the public is left to read through large reference materials to determine where the reference might provide information pertinent to the technical report. In addition, CRC seems to assume that despite this huge volume of information without specific citations, the public will still have an opportunity to meaningfully comment within a thirty-day comment period. The lack of specific citations serves to hamper the public in trying to meaningfully comment on the proposed project and undermines the NEPA process.

CRC's response to PEAC's water quality comments fails to meet NEPA requirements

PEAC submitted a number of comments addressing water quality issues identified in the DEIS. CEQ regulations require that agencies preparing final environmental impact statements "assess and consider comments" and where a comment does not warrant further agency response, the agency must "[e]xplain why" and cite "sources, authorities or reasons which support the agency's position."[19] Overall, the response to comments indicates that the FEIS is striving to meet the requirements of NEPA. But ultimately it fails for two basic reasons. First, to the extent that responses include updated or further information, that information is helpful, but should have been included in the DEIS. Providing the information in the FEIS indicates that it is available and should be provided to the public in a form that allows them to meaningfully comment on the information. A Supplemental EIS should be prepared to allow the public to adequately address all the new and updated information added to the FEIS. Second, to the extent that the FEIS attempts to equate compliance with other regulations and law as compliance with

[19] 40 C.F.R. § 1503.4(a).

O-002-014

NEPA, it violates NEPA. NEPA requires an independent analysis of impacts. While the underlying regulatory framework is relevant for NEPA purposes, compliance with it does not discharge an agency's duty to conduct a full NEPA analysis. The following discusses specific comments and responses where the FEIS fails to adequately address PEAC's comments related to water quality issues.

Specific inadequate responses:

PEAC pointed out that the DEIS failed to analyze the water quality impacts on the Columbia River, Columbia Slough, and Burnt Bridge Creek. PEAC noted that one alternative had runoff going into the Columbia Slough instead of the Columbia River, despite the fact that the Slough is probably more sensitive to water quality changes. In response, the FEIS states, that "[d]ue to design refinements, diversion of stormwater from the Hayden Island area to the Columbia Slough is no longer needed. Mitigation for stormwater is discussed as stormwater treatment, treatment facilities, and "best management practices" in Section 3.14 of the FEIS.[20] Further:

> Project designs have been refined so that stormwater is no longer diverted from the Hayden Island area to the Columbia Slough watershed. Furthermore, stormwater treatment will need to comply with local, state, and federal regulations which are meant to be protective of the environment. When approved, stormwater runoff would not exceed water quality standards. Please see Chapter 3 (Section 3.14) for updated analysis of stormwater management.[21]

While these comments do clarify that refined project designs will no longer result in Hayden Island area runoff to the Columbia Slough, there is still runoff to the Columbia Slough. Incomprehensibly, the FEIS seems to ignore the possible effects on the Columbia Slough, lumping it together with the Columbia River, and concluding that because "the Columbia River

[20] FEIS Comment Response O-035-012.
[21] FEIS Comment Response O-035-133.

O-002-014

and Columbia Slough are large water bodies . . . the project-related increase in stormwater quantity would not result in a measurable increase of flows in these surface waters."[22] In addition, the response ignores the broader issue. Water quality impacts on the receiving waters are not adequately discussed in the DEIS or FEIS. This is especially true for the Columbia Slough, which is a sensitive waterbody. The FEIS seems to equate the proposed compliance with water quality standards with disclosing impacts from the proposed project under NEPA. This is not sufficient. NEPA requires that agencies discuss direct and indirect effects and their significance.[23] Simply stating that water quality standards will be complied with does not disclose effects.

In another comment PEAC noted that the DEIS did not include any analysis about the specific pollutants in current stormwater discharges, so composition of re-diverted stormwater discharges was unknown. As a result, there is no way for the DEIS to accurately gauge pollutant concentrations and whether discharges will comply with water quality standards and TMDLs for the receiving waters. This is true for both treated and untreated stormwater. In response, the FEIS states:

> All permits and approvals for water quality and ESA would be obtained prior to construction and operation of the proposed project . . . . Construction activities are also regulated under Oregon DEQ and Washington DOE water quality permits. These permits set thresholds for turbidity and other water quality parameters . . . .
>
> The project met regularly with NMFS, USFWS, Oregon DEQ, Washington DOE, EPA, and many other agencies since 2006 to discuss the project and potential impacts. Both NMFS and USFWS concurred with coordinating through the DEIS and then initiating formal consultation after the DEIS. Submittal of a biological assessment occurred in July 2010, with the project receiving a letter of concurrence from USFWS in November 2010 and biological opinion from NMFS in January 2011.[24]

[22] FEIS at 3-343.
[23] 40 C.F.R. § 1502.6.
[24] FEIS Comment Response O-035-058.

O-002-014

As a result, the FEIS concludes that "[t]here is no evidence that complying with these treatment standards will result in a violation of standards under the Clean Water Act."[25] However, that is not the primary issue for NEPA purposes. All relevant laws, federal and state, should be complied with in carrying out the project, but compliance with those laws does not remove the agency's responsibility to prepare an EIS that adequately addresses impacts to the environment in a way that allows the public to meaningfully comment on the proposal. As discussed further below, the FEIS also does not correct the deficiencies noted in the DEIS with respect to pollutant load analysis.

PEAC further noted that the DEIS failed to properly evaluate base level runoff from the I-5 bridge, relying on EPA guidance about "typical" highway runoff. The base level is needed to determine if there is an actual increase in the volume of stormwater discharges from the increase in area of impervious surfaces. In response, the FEIS states:

> The DEIS and the associated Water Quality and Hydrology Technical Report used the WSDOT/FHWA method for evaluating highway runoff. The EPA reference supports that typical highway runoff includes those pollutants listed on 3-381 of the DEIS. The project team notes a reasonable connection between DDE, PCBs, arsenic, and dioxin highway runoff. However, there may be some indirect connection between temperature and total dissolved gas and highway runoff. There is a connection between PAHs in the forms of oils and greases and highway runoff under some situations. The proposed stormwater treatment facilities would treat for pollutants such as these.[26]

This response indicates that the project team is willing to rely on a model that may not accurately represent stormwater conditions on the ground. Further, it fails to address PEAC's concern that without a proper base line, it is impossible to determine whether the proposed project will reduce the harmful effects of stormwater runoff. The response simply assumes that the stormwater treatment facilities will treat for the relevant pollutants and their interactions. As discussed

[25] *Id.*
[26] FEIS Comment Response O-035-130.

O-002-014

further below, the stormwater treatment plan has not yet been finalized or fully provided to the public. Without this information, or information about the base line for current runoff, there is no way for the public to obtain an accurate determination of what, if anything, this project will succeed in doing with regard to stormwater pollution reduction.

In a related comment, PEAC stated that the DEIS must properly analyze the current pollutants in runoff, to accurately determine the environmental impact the build alternatives will have on discharges to receiving waters. Because the DEIS discloses the location of current discharges through road-side grates, obtaining samples from these location would not be difficult. In response, the FEIS concludes:

> The analysis referred to in the comment is not required under current local, state, or federal regulations. Also, although collecting and analyzing stormwater runoff from the I-5 bridge may have resulted in some site-specific and storm-specific data, this data is generally limited unless it is done over many, many sampling periods under different meteorological and traffic conditions. Updated stormwater modeling has been completed and is discussed in Section 3.14 of the FEIS and in the Water Quality and Hydrology Technical Report.[27]

The response is correct that regulations do not require a specific type of sampling analysis. However, again, the response misses the underlying point. There has not been a proper determination of the pollutants currently being discharged in runoff from the I-5 bridge. As a result, it is impossible to determine what effect the proposed project will have on pollution reduction. Further, the response's direction to updated stormwater modeling is not helpful. Even less pollutants are considered in the FEIS than were first considered in the DEIS, with no explanation for this change.

Much of PEAC's concern with the DEIS water quality analysis rests on the assertion that even though there will be an increase in impervious surfaces, creating more runoff, this increase

[27] FEIS Comment Response O-035-131.

O-002-014

is offset by more storm treatment facilities. In response to PEAC's comments concerning the flaws in this assumption, the FEIS states essentially the same thing:

> [A]lthough the total amount of pollutant generating impervious surface would slightly increase for the LPA, the amount of untreated impervious surface would drop dramatically (from 219 acres to 0 acres) compared to existing conditions and the No-Build Alternative. As a result, the LPA is expected to improve water quality in the Columbia River relative to the No-Build Alternative."[28]

However, there is still no base line provided. It remains unclear whether the FEIS assertions are supported.

Further, PEAC noted that because the stormwater collection and treatment system is still not finalized the DEIS cannot accurately report impacts to the public. Generally the delay in analysis of impacts to water quality makes it impossible for the public comment, in violation of NEPA. This delay in making many decisions also puts the resolution of important issues in the Final EIS, when the public can no longer meaningfully comment. In response to this comment, the FEIS states:

> The level of design for alternatives evaluated in the DEIS was conceptual, but provided an understanding of whether and how stormwater could be retained and treated to current standards for each of the alternatives. While the exact location and type of treatment facilities were not finalized prior to the DEIS, the effect on local waterbodies was identified for each of the alternatives. Advancements in design have changed the amount of runoff that would flow into some local watersheds, but this has not significantly changed the impact of this project on water quality and has not affected the ability of the project to meet existing water quality standards. Water quality analysis has been updated for the FEIS, and is included in Chapter 3 (Section 3.14).[29]

This new analysis has been provided only in the FEIS, when the public will not longer have the opportunity to meaningfully comment. Where new information is included, especially information that has a direct bearing on whether the project will effectively avoid environmental

[28] FEIS Comment Response O-035-130; *see also* O-035-132, O-035-134.
[29] FEIS Comment Response O-035-135.

O-002-014

degradation, the public must have an opportunity to review it before a decision is made. A supplemental EIS should be prepared to allow the public this opportunity. The stormwater facilities design is an integral part of the proposed project and bears directly on environmental issues.

PEAC also noted that the DEIS failed to disclose the water quality impacts from stormwater discharges off the 35-38 acres of untreated impervious surfaces under each of the build alternatives. In response the FEIS claims that the DEIS adequately discussed pollutant loading "including impacts from untreated areas."[30] It then concludes that "although the total amount of pollutant generating impervious surface would slightly increase for the LPA, the amount of untreated impervious surface would drop dramatically compared to existing conditions and the No-Build Alternative. As a result, the LPA is expected to improve water quality in the Columbia River relative to the No-Build Alternative."[31]

However, the FEIS still fails to consider increased pollutants from staging sites as part of the analysis for impervious surfaces. Staging sites are not considered as one of the project elements leading to the increase in impervious surfaces.[32] Yet, the FEIS acknowledges that "[s]taging and casting/assembly site activities may increase stormwater runoff over existing conditions and may increase pollutant levels in the runoff."[33] The FEIS simply concludes that "any staging and/or casting site would be required to meet all applicable stormwater requirements. All necessary permits would be secured prior to site development and operations for any major staging or casting yard."[34] This does not disclose the effects from staging site

[30] FEIS Comment Response O-035-134.
[31] *Id.*
[32] FEIS Exhibit 3.14-5 at 3-343.
[33] FEIS at 3-348.
[34] *Id.*

O-002-014

impervious surfaces, and does not provide an explanation for why these sites are not included in the analysis of impervious surfaces created. Overall, the FEIS readily admits direct impacts to waterways, however the FEIS also claims there will be no impacts to waterways. These statements conflict and show a lack of ground and surface water modeling to limit adverse impacts to natural resources.

PEAC commented that the DEIS fails to adequately analyze the effects of project construction on water quality standards. In response, the FEIS directs attention to "Chapter 3 (Sections 3.15 and 3.18) of the FEIS for the mitigation measures developed to avoid and minimize the impacts listed. Impacts that cannot be avoided must be minimized. The existence of potential impacts related to sediments and contaminants do not automatically mean that water quality standards would be exceeded if such impacts are not measurable. Construction activities will require the approval of the Washington State Department of Ecology and Oregon DEQ through a water quality certification and NPDES 1200-CA permit, limiting water quality impacts and imposing appropriate impact avoidance and minimization measures."[35] This does not adequately address the issue because, as this response admits, impacts related to sediments and contaminants during construction may affect water quality, and there is no measurement of those impacts. Just saying that such effects will not "automatically" violate water quality standards is not sufficient. There is no showing in the FEIS whether water quality standards will be violated or not violated. Further, water quality standards are not the only measure of impacts to the environment that may be relevant.

One of PEAC's comments focused on the water quality mitigation section of the DEIS, which was wholly inadequate. There was no listing of best management practices or any details.

[35] FEIS Comment Response O-035-137.

O-002-014

The section simply provided conclusory statements. In response, the FEIS indicates that the water quality analysis and discussion has been updated, and now includes best management practices.[36] Further, "[t]he development of stormwater treatment systems that meet the standards of local and state jurisdictions, plus those of WSDOT and ODOT, includes rigorous review by those agencies and others."[37]

The inclusion of best management practices is an improvement, however, as with much of the water quality analysis, it should have been included in the DEIS to allow the public to meaningfully comment. Further, relying on the scrutiny of other agencies in their functions as regulators of stormwater runoff is not adequate for NEPA purposes. As stated earlier, it is certainly important that all relevant regulations and laws be complied with by the proposed project. However, NEPA imposes a separate obligation to consider and analyze impacts to the environment. The regulatory framework in place is certainly part of that consideration[38], but compliance with regulation in and of itself does not meet the requirements of NEPA. Other impacts may not be addressed by regulations, and regulations may be focused on only eliminating certain impacts but not others. An EIS must address all direct and indirect effects and their significance.[39]

The FEIS does not satisfy the requirements of NEPA and a Supplemental EIS should be prepared.

The FEIS still fails to provide a base line level of stormwater runoff volume and pollutant loads.

The FEIS continues to emphasize that the no-build alternative will have a worse effect on water quality than the locally preferred alternatives (LPAs). The FEIS states:

[36] FEIS Comment Response O-035-138.
[37] *Id.*
[38] 40 C.F.R. § 1502.16(c).
[39] 40 C.F.R. § 1502.16.

O-002-014

> "The No-Build Alternative would adversely affect the quality of receiving waters in the long-term. Pollutant-loading of project waterways is currently influenced by a high percentage of untreated stormwater across the project corridor. If the LPA were not constructed this stormwater would likely remain untreated. Refer to Section 4.3 for further detail. The No-Build Alternative would not increase impervious surface and therefore, not increase stormwater volumes. However, average daily traffic (ADT) would increase with the No-Build Alternative and pollutant loads and concentrations would increase, though quantification is not possible. Yet, as previously stated, the majority of the stormwater would remain untreated."[40]

However, the assertion that the no build alternative will result in worse water quality is not supported by sufficient evidence. No base line has been established for the current volume and pollutant loads of stormwater runoff from the I-5 Bridge. Thus, it is impossible to conclude, from the information provided in the FEIS, that the LPAs will result in better water quality than the no build alternative.

In addition, the conclusion that the stormwater treatment plan will address the increased acreage of impervious surfaces and the relevant pollutants is not supported by the information in the FEIS. The FEIS has not accounted for all the stormwater runoff that will be created due to increase in impervious surfaces. For example, "no options have been identified to treat runoff from about 7.1 acres of new and resurfaced I-5 impervious surface immediately north of Victory Boulevard."[41]

Further, the FEIS seems to indicate that actually not all of the acres of contributing impervious area (CIA) will end up being treated. "The total CIA for the project is estimated to be 298 acres."[42] In reviewing the technical report on pages 1-17 and 1-18, if one adds up the number of acres that stormwater treatment facilities will cover in both Washington and Oregon, only 216 total acres will be treated. Because the public is not given information to establish how

[40] Water Quality & Hydrology Technical Report for the FEIS, at 1-12.
[41] Water Quality & Hydrology Technical Report for the FEIS, at 1-17.
[42] Water Quality & Hydrology Technical Report for the FEIS, at 2-2.

O-002-014

much pollution is likely to result from these 82 acres of untreated runoff, it is impossible to say how much of an effect this may have on water quality.

O-002-015

There are still many aspects of the project that require further analysis.

The DEIS delayed the full consideration of many integral project components until the FEIS. Thus, the public is presented with brand new and updated information in the FEIS. This does not allow the public to meaningfully comment on this new information. A supplemental EIS should be prepared to give the public this opportunity. In addition, in some cases the analysis that was delayed until the FEIS still has not been completed.

The Stormwater treatment facility design is still not finalized.

The FEIS fully admits that the final stormwater treatment design is still not complete. In the Water Quality and Hydrology section summary, the FEIS states:

> This section also discusses a conceptual stormwater treatment design for the LPA that has been developed for analysis purposes and to advance discussions with agencies on regulatory approvals. This design meets regulatory criteria. Agency coordination will continue through the development of the final stormwater design, to be completed as part of future permitting.[43]

The FEIS concludes that the "design of the stormwater collection and treatment system will be further developed, refined and analyzed after the ROD as part of the final project design."[44] This delay in allowing the public access to such a crucial component of the overall project is unacceptable. The FEIS continues to rely on the stormwater collection and treatment system as a cure all in the water quality context. Over and over the FEIS relies on the stormwater treatment system to gloss over the increased volume of stormwater runoff that will result from the creation of acres of new impervious surfaces, and in explaining away possible effects from pollution in the runoff. Yet, the actual stormwater treatment system design has not been finalized. This

[43] FEIS at 3-333.
[44] FEIS at 3-350.

O-002-015

PEAC commented that stormwater facilities should be advanced to final design prior to completing the FEIS. This is not required by NEPA nor any other law or regulation. As the FEIS discusses, the stormwater management facilities evaluated in the FEIS demonstrate the feasibility of providing stormwater management and treatment that will avoid significant adverse impacts to water quality and will comply with relevant regulations. The FEIS also notes that refinements will likely be made during final design. Those refinements are not expected to substantially change the performance of the facilities nor the impacts. However, while not expected, should such refinements result in new significant adverse effects not previously evaluated, then that could trigger a supplemental EIS.

O-002-015

provides no assurance that the stormwater treatment system will actually provide the benefits the FEIS asserts, and calls into question the entire water quality analysis.

The FEIS improperly puts off flood plain evaluations.

Executive Order 11988 and local and state regulations require more detailed analysis of floodplain impacts, including a no-rise analysis, prior to project approval.[45] The LPAs involve new bridge piers within the Columbia River. Thus, there is "the potential long-term impact of a rise in the flood elevation."[46] The FEIS delays consideration of this impact, indicating that it "would be addressed in a later design phase by conducting a flood-rise analysis."[47] If the flood-rise is later found to exceed that allowed, "the rise would be mitigated through floodplain excavation (cut/fill balance) activities."[48] This suggests that not only is the FEIS waiting to determine if future action will need to be taken, but that it fails to consider this future action as part of the indirect effects of the proposed project. Further excavation might be required to deal with a flood-rise that exceeds the allowed levels, resulting in churned up sediments and turbidity increases. However, the analysis of these impacts is not included in the FEIS and is delayed to some future time "prior to permitting" when the public will no longer be able to consider the effects as part of the proposed project.[49]

Pollutant loads are not properly analyzed to ensure that water quality standards and Total Maximum Daily Load (TMDL) allocations will be met.

O-002-016

The FEIS states that water quality limited waterways "may" be addressed through permitting, but does not adequately analyze impacts to water quality. For example, "[t]here may

[45] FEIS at 3-344.
[46] Water Quality & Hydrology Technical Report for the FEIS, at 6-1.
[47] *Id.*
[48] *Id.*
[49] FEIS at 3-344.

O-002-016

The FEIS and its technical reports and appendices discuss the use of water quality treatment scenarios and provide results of models tailored to roadway projects and their runoff. The use of the WSDOT-FHWA model is summarized on page 3-341 of the FEIS and discussed in further detail on page 4-6 of the Water Quality and Hydrology Technical Report. This discussion is refined in the technical report errata. As summarized on 3-341 and 3-342 of the FEIS, LPA Option A would increase total impervious surfaces by 42 acres from approximately 239 acres currently. Of these 42 acres, only 28 acres are anticipated to be pollutant-generating, with the remainder being surfaces such as bike/pedestrian and LRT facilities. Therefore, although an increase of 11 percent of pollutant-generating impervious surface might occur, a decrease of untreated stormwater runoff would also occur, from approximately 219 acres to zero. The analysis using the available models and the discussion associated with stormwater treatment BMPs (in the Appendix of the Water Quality and Hydrology Technical Report) show that overall pollutant loading will decrease and that stormwater treatment will treat at least 80 to 90 percent of annual runoff. The project has committed to increasing that treatment rate wherever practicable, and is required in Washington to treat 91 percent of annual runoff (page 4 of Appendix A of the Water Quality and Hydrology Technical Report). The BMPs proposed for stormwater treatment are designed specifically for treatment of roadway runoff and are effective in reducing sediments, particulates, and dissolved metals (Page 10 of Appendix A of the Water Quality and Hydrology Technical Report). Where high concentration of oils and greases are anticipated, oil control pretreatment may also be required for proper operation of stormwater BMPs (Page 10 of Appendix A of the Water Quality and Hydrology Technical Report).

The stormwater BMPs were chosen based on a multi-agency effort associated with both states' Departments of Transportation and relevant regulatory agencies. As MS4 permit holders, ODOT and WSDOT work

O-002-016

be special runoff control requirements [during construction] to address the 303(d) listings of each of the waterways in the project area."[50] Such statements do not adequately address pollutant loads and impacts associated with the proposed project. Relying on permitting compliance does not comply with NEPA because it fails to address all the potential impacts from pollutants. Permits do not limit all relevant pollutants. As a result, there may be impacts to water quality even where permits are complied with. These impacts must be disclosed in a NEPA analysis.

The FEIS reduces the number of pollutants considered as compared to the DEIS, without explanation. The FEIS no longer considers Total phosphorus in its consideration of annual pollutant load estimates.[51] However, both the Columbia Slough and Fairview Creek have TMDLs established for Eutrophication (pH, dissolved oxygen, phosphorus, and chlorophyll *a*), which includes phosphorus.[52] By not even considering the pollutants for which the receiving waters are water quality limited, the FEIS fails to adequately ensure that water quality standards will be met. In addition, the FEIS fails to accurately report the extent to which receiving waters are water quality limited. FEIS Exhibit 3.14-3 lists Burnt Ridge Creek as not having an established TMDL. However, while technically correct, the creek is currently under TMDL study to determine what needs to be done to improve failed water quality standards. The Washington State Department of Ecology has been gathering data for the past two years and this should be ignored. The FEIS should provide the public with this relevant background information. NEPA regulations require that an EIS provide a "full and fair discussion" of environmental impacts.[53]

[50] FEIS at 3-345.
[51] FEIS at 3-307; compare DEIS at 3-386.
[52] Water Quality & Hydrology Technical Report for the FEIS, at exhibit 4-2, 4-4 to 4-5 & exhibit 1-3 at 1-11.
[53] 40 C.F.R. § 1502.1.

with DEQ and Ecology, respectively, to determine appropriate treatment measures to ensure water quality in receiving waters. Thus, through use of the BMPs identified, the project team is confident that proper treatment for pollutants was adequately addressed in the FEIS.

As noted, further discussion with DEQ and Ecology will occur during permitting to address any concerns on water quality.

In addition, immediately prior to release of the FEIS for public review, the Regional Sediment Evaluation Team concurred with findings of a sediment analysis in the North Portland Harbor and the Columbia River. The sediment analysis found no contaminants above Sediment Evaluation Framework screening levels, with the majority of sediment constituents below reporting levels. See Appendix G of the Hazardous Materials Technical Report for the results of this analysis.

O-002-016

The technical report further admits that not all relevant pollutants are being analyzed. For example, in the Columbia Slough Basin analysis the technical report states that the analysis "does not include estimates for fecal coliform and lead" because "it is not clear whether these pollutants, for which there are TMDLs, would be reduced through the construction of the LPA."[54] The report goes on to conclude, however, that "with the addition of stormwater treatment and evidence that shows reduction of several pollutants, it is not likely that there would be a substantial increase in these pollutants and the LPA may actually result in a decrease of these pollutants."[55] There is no evidence that these pollutants will be decreased, or that the proposed stormwater treatment will have any impact on these specific pollutants. Further, the FEIS admits that "[p]ollutants from roadways typically include fuel, oil, grease, and other automotive fluids; heavy metals such as copper and zinc; and small particles from erosion or road sanding which can temporarily make waterways more turbid (cloudy)."[56] However, not even all these "typical" pollutants are considered and analyzed in discussing effects to water quality. Failing to analyze relevant pollutants, especially for which the receiving waters are water quality limited, does not promote confidence in the FEIS analysis of water quality impacts and does not satisfy the requirements of NEPA.

The FEIS also fails to provide support, even in the technical report, for assertions that riparian shading does not really affect water temperature in the Columbia River. The report states:

> "No TMDL has been established for any pollutant associated with highway runoff. However, the Columbia River in the project area is 303(d) listed for temperature. The project would remove approximately 250 feet of vegetation along the north and south

[54] Water Quality & Hydrology Technical Report for the FEIS, at 4-8.
[55] *Id.*
[56] FEIS at 3-333.

O-002-016

shorelines of the river in the vicinity of the new bridge structure and along the north and south shorelines of Hayden Island. Yet, this would not have a significant on the Columbia River water temperatures due to the large size of the river and the very minor role riparian vegetation plays on cooling water temperatures along the river currently."[57]

Thus, despite the FEIS' recognition that the Columbia River is water quality limited for temperature, among other pollutants,[58] it merely concludes, without citing any support for its assertion, that temperature will not be significantly affected by the proposed project.

Finally, the FEIS asserts that "[t]here are no known records of contaminated sediments in the Columbia River portion of the project area."[59] As a result, the FEIS assumes no re-suspension of pollutants in these sediments.[60] However, the Boise Cascade property within the project footprint (slated for shoreline redevelopment) was a former Superfund site. In addition, there is a scrap metal processing station immediately adjacent to the current bridge with considerable permit violations, including PCBs and other volatiles. The FEIS does not seem to have adequately researched potential contaminants in the area. This question has been raised several times with regard to mobilization of sediment into Vancouver Lake's flushing channel downstream, which is a closed system. Pollutants entering Vancouver Lake would not be flushed back out. Yet, there is no coordination planned to operate the flushing gates to prevent sediment or pollutant transport into the Lake during pile driving operations or other sediment disturbing activities.

The FEIS improperly limits consideration of the alternatives.

O-002-017

The FEIS only evaluates and provides updated analysis of water quality issues for the no build and locally preferred alternatives (LPAs). The FEIS states that Section 6002 of

[57] *Id.*
[58] The Columbia River is water quality limited for Toxics, Eutrophication, and temperature, with TMDLs set for Dioxin and Total Dissolved Gas. FEIS Exhibit 3.14-3.
[59] FEIS at 3-346.
[60] *Id.*

O-002-017

Following the DEIS, it was necessary to develop the preferred alternative to a higher level of detail, as allowed under Section 6002 of SAFETEA-LU [23 USC 139(f)(4)(D)], and as described on page 3-5 of the FEIS. Where this higher level of detail made substantial changes in estimated impacts, this information was also incorporated into the other alternatives, as appropriate, in order to maintain an apples-to-apples comparison. In some cases, updates were quantitative, while in others they were qualitative. For example, the LPA stormwater management design had to be advanced and evaluated to a higher level in order to develop a Biological Assessment (BA) in compliance with Section 7 of the Endangered Species Act. A BA is prepared on just one alternative, not multiple alternatives, so the stormwater management design and quantitative analysis were not revised for the other alternatives. However, the EIS noted that "If Alternatives 2 through 5 were reanalyzed using the updated stormwater design, they would provide water quality improvements similar to the LPA." This allowed the FEIS to maintain an 'apples-to-apples' comparison of all alternatives without spending additional public funds to provide a detailed recalculation of pollutant loading for every alternative (see the summary of water quality impacts on pages S-34). While such added analysis and cost would have provided additional quantitative data, it would not change the relevant conclusion of the comparison of the alternatives--that is, that all the build alternatives would provide similar water quality improvements.

O-002-017

SAFETEA-LU [23 USC 139(f)(4)(D)], allows for this narrowing of analysis "to facilitate development of mitigation measures and compliance with other environmental laws."[61] However, 23 U.S.C. § 139(f)(4)(D) goes on to state that this more focused analysis should only occur "if the lead agency determines that the development of such higher level of detail will not prevent the lead agency from making an impartial decision as to whether to accept another alternative which is being considered in the environmental review process." In addition, U.S. Dept. of Transportation Guidance on the issue states, "Under any scenario, a non-Federal lead agency proposing to develop the preferred alternative to a higher level of detail should state why it needs the greater design detail and why such work will not prejudice the consideration of alternatives."[62] In the context of the CRC FEIS, there are two problems with allowing the FEIS to only update the analysis for the no build alternative and LPAs. First, because there was not sufficient analysis of the alternatives in the DEIS, it is important that all the alternatives be developed completely in an FEIS, and where appropriate, a Supplemental EIS. Second, the FEIS

[61] FEIS at 3-334.

[62] UDOT SAFETEA-LU Environmental Review Process (Public Law 109-59) -FINAL GUIDANCE, 29 (November 15, 2006), *available at* http://www.fhwa.dot.gov/hep/section6002/index.htm, states "Under any scenario, a non-Federal lead agency proposing to develop the preferred alternative to a higher level of detail should state why it needs the greater design detail and why such work will not prejudice the consideration of alternatives. All lead agencies should evaluate carefully any proposal to develop a preferred alternative to a higher level of detail and consider the potential that such action has for creating a bias in the later consideration of alternatives and selection of the project alternative. The evaluation also should consider other factors that may affect the environmental review process. Examples of such factors include whether the identification of a preferred alternative might have an unacceptably adverse effect on public confidence in the environmental review process for the project; whether that adverse effect on public confidence could be avoided by delaying the differential treatment of alternatives until a later point in the environmental review process; how the difference in level of detail among the alternatives might affect the presentation of the alternatives in the environmental documents; or the extent to which the proposed preferred alternative is supported by the results of public and participating agency involvement."

O-002-017

has not explained why only the LPAs should be developed to a higher level, or why that updated analysis will not result in prejudicing the consideration of the other alternatives.

The alternatives analysis of the new information needs to be more fully developed.

The FEIS fails to fully consider alternatives as required by NEPA. By only providing an analysis of the LPA, along with the conclusory statement that most of the new information did not warrant updating analysis of the non-preferred alternatives,[63] the FEIS ignores the import of the alternatives analysis, which NEPA regulations describe, "as the 'heart' of the EIS."[64]

Further, even if *most* of the new information does not warrant analysis, if any new information demonstrates a substantial impact to the projected environmental effects of a non-preferred alternatives, CRC Project staff must disclose such information. This disclosure is pertinent to the process of public commenting and transparency. For example, "the conceptual stormwater treatment design used in the DEIS to analyze Alternatives 2 through 5 was updated for this FEIS, and since publication of the DEIS a more precise understanding of the project footprint and stormwater basins has been developed. If Alternatives 2 through 5 were reanalyzed using the updated stormwater design, they would provide water quality improvements similar to the LPA."[65] However, the other alternatives were not reanalyzed, so the public has no way to determine what "similar" water quality improvements might entail.

PEAC requests that the CRC Project staff perform a supplemental analysis in light of the new information for the non-preferred alternatives to adequately fulfill the obligation under NEPA of fully analyzing alternatives. Under NEPA, agencies must prepare supplemental EISs where there is "significant new circumstances or information relevant to environmental concerns

[63] FEIS at 3-334.
[64] *Kootenai Tribe of Idaho v. Veneman*, 313 F.3d 1094, 1120 (9th Cir. 2002) (abrogated on other grounds by *Wilderness Soc. V. USFS*, 630 F.3d 1173 (9th Cir. 2011).
[65] FEIS at 3-340.

O-002-017

and bearing on the proposed action or its impacts." 40 C.F.R. § 1502.9. The FEIS provides significant new information further developing the LPAs and bearing directly on water quality and other environmental issues.

Under USDOT Guidance documents, the FEIS must ensure that considering some alternatives in more detail will not prejudice the final consideration of the other alternatives.

Under USDOT guidance documents, the lead agencies of a proposed project "should evaluate carefully any proposal to develop a preferred alternative to a higher level of detail and consider the potential that such action has for creating a bias in the later consideration of alternatives and selection of the project alternative."[66] Further, other factors should be considered that may affect the environmental review process more generally. For example, the agencies should evaluate "whether the identification of a preferred alternative might have an unacceptably adverse effect on public confidence in the environmental review process for the project; whether that adverse effect on public confidence could be avoided by delaying the differential treatment of alternatives until a later point in the environmental review process; how the difference in level of detail among the alternatives might affect the presentation of the alternatives in the environmental documents; or the extent to which the proposed preferred alternative is supported by the results of public and participating agency involvement."[67]

Here, the FEIS fails to consider, or at the very least explain its consideration, of these factors. There is no indication that the FEIS considered whether bias would result by only further developing the LPAs' analyses. Further, there is no indication that the public perception of these alternatives was considered, given the overwhelming focus just on the LPAs in the

[66] UDOT SAFETEA-LU Environmental Review Process (Public Law 109-59) -FINAL GUIDANCE, 29 (November 15, 2006), *available at* http://www.fhwa.dot.gov/hep/section6002/index.htm.
[67] *Id.*

O-002-017

FEIS. This is inconsistent with USDOT guidance. If the FEIS intends to rely on 23 U.S.C. § 139(f)(4)(D) to allow it to duck its responsibility to consider all alternatives in the FEIS, then the FEIS should at least comply with USDOT guidance documents dealing specifically with 23 U.S.C. § 139(f)(4)(D) requirements. The FEIS must explain why further consideration of the other alternatives is not warranted, and ensure that this result will not prejudice the overall environmental analysis.

The FEIS fails to describe how mitigation efforts will reduce impacts to the water bodies.

O-002-018

NEPA requires that an agency include a discussion of mitigation measures in an environmental impact statement.[68] Incorporation of detailed mitigation strategies are required by law. The Supreme Court does not allow for the omission of details regarding mitigation strategies:

> Omission of a reasonably complete discussion of possible mitigation measures would undermine the "action-forcing" function of NEPA. Without such a discussion, neither the agency nor other interested groups and individuals can properly evaluate the severity of the adverse effects.[69]

The section concerning potential mitigation measures for adverse effects to water quality is wholly inadequate. The Water Quality and Hydrology Technical Report does not sufficiently disclose what mitigation measures will be imposed to prevent a significant environmental impact. The Report states that, "hydraulic analysis and a flood-rise analysis for the Columbia River structures would be conducted to ensure that there are no adverse effects of the project to the Columbia River's hydrologic regime."[70] This perfunctory description of mitigation measures and referencing future analyses in the FEIS is inconsistent with the "hard look" the CRC project

[68] 40 C.F.R. §§ 1502.14(f), 1502.16(h).
[69] *Methow Valley,* 490 U.S. at 352.
[70] Water Quality and Hydrology Technical Report for the Final Environmental Impact Statement at 1-16.

O-002-018

Mitigation under NEPA is considered to be those activities that avoid or minimize impacts, as well as those that are conducted as part of compensation. In this context, mitigation is discussed in detail in several locations. Pages L-19 through L-23 of Appendix L (Mitigation Matrix) of the FEIS provide a description of the mitigation measures proposed as part of the project. In addition, mitigation of water quality and hydrology impacts are discussed in detail starting on page 3-348 of the FEIS, in Section 6 of the Water Quality and Hydrology Technical Report, and as part of Appendix A of the Water Quality and Hydrology Technical Report. These sections of the document provide necessary details to analyze potential impacts due to stormwater quality and quantity.

Because impacts from water quality have been avoided or minimized, or likely improved in the long-term due to the capture and treatment of currently untreated stormwater, compensatory mitigation is not required for water quality issues.

A complete hydraulic analysis will not be performed until further design of in-water structure is completed. During subsequent phases of design, the piers will be designed in a way to produce no-rise or limit it, while still staying within the proposed footprint and providing sufficient support to the bridges. Should mitigation measures be necessary, a re-evaluation under NEPA could occur as appropriate.

O-002-018

staff are required to render under NEPA. Mitigation must be "in sufficient detail to ensure that environmental consequences have been fairly evaluated."[71]

Specifically, because Burnt Bridge Creek and Fairview Creek are more prone to be affected by increased impervious surfaces, it is essential that the FEIS disclose how mitigation will be implemented. Stating broadly that "[e]ngineered water quality facilities would be designed to reduce the rate of runoff," does not sufficiently fulfill the obligation to provide mitigation strategies as required by NEPA.[72] In addition, the FEIS states that much of the proposed mitigation is contingent on third party approval.[73] This fails to ensure that even the mitigation that has been disclosed in the FEIS will actually occur, or that the actual mitigation will be comparable to what is discussed in the FEIS.

The CRC Project Staff should prepare a Supplemental Environmental Impact Statement describing in detail the mitigation strategies to be employed. All major federal action should be halted until the hydraulic analysis and a flood-rise analysis for the Columbia River structures are performed. After incorporating the findings of these analyses, and the required comment period for the proposed SEIS, the public will be adequately informed, allowing for all of the environmental consequences to be fairly evaluated as required by law.[74]

The Long-term Effects section fails to provide adequate information.

O-002-019

The FEIS needs to describe what significant environmental impacts will occur as predicted by modeling. The FEIS should describe what the change in water quality will be for

[71] *Methow Valley*, 490 U.S. at 352.
[72] FEIS at 3-343.
[73] FEIS at 3-345 ("The LPA would not be constructed until state, federal, and local agencies approve the proposed impact minimization and mitigation methods.").
[74] *Methow Valley*, 490 U.S. at 352.

O-002-019

This comment has several elements related to stormwater quality, modeling, and treatment.

The FEIS and its associated documents provided an adequate analysis of stormwater impacts using available and accepted methods. Detailed pollutant-loading analysis by basin is included in the Water Quality and Hydrology Technical Report, with further clarification on page 3 of the FEIS Errata. Analysis of other pollutants and stormwater constituents might provide more details, but models of these pollutants are not available in the acceptable WSDOT-FHWA method. Other models have not been vetted for use in this area, and results would not necessarily be usable on this project.

Phosphorus modeling was included in the model used for the DEIS, but not in the FEIS. The model assumes that phosphorus is completely treated (reduced to 0) with the enhanced treatment techniques proposed as part of the project and as required in all WSDOT projects. Because all impervious surface in the project footprint and its CIA will be treated with enhanced treatment BMPs, phosphorus therefore could not be calculated in the updated WSDOT-FHWA model and would not need to be, given the assumption of its removal through enhanced treatment.

Retention ponds and wetland treatment systems are designed to filter stormwater, and to remain dry during periods of dry weather. WSDOT and ODOT maintenance staff are trained to identify areas of standing water and to address these issues through modifications of the facilities while retaining treatment thresholds.

With regards to the modeled 0.01 pound per year increase of dissolved copper, the amount of copper is minuscule relative to the drainage area. PEAC is correct in noting that dissolved copper is an inhibitor of olfactory function in juvenile coho salmon and other fish. However, the threshold

O-002-019

each water body involved, not just provide a determination that addition of pollutants will increase or decrease slightly.

Exhibit 3.14-4[75] does not adequately demonstrate to the public what environmental impacts may occur from all possible pollutant additions.

The FEIS states that total suspended solids and other pollutants entering the project waterways would decrease substantially in the main project area as a result of the construction of the LPA as shown in Exhibit 3.14-4. But exhibit 3.14-4 only addresses TSS, dissolved copper, and dissolved zinc. Inclusion of other pollutants in this analysis should be required. Due to sensitive habitats in the area, additions of other pollutants such as lead and phosphorus can have a significant impact to the environment and should be analyzed. The FEIS fails to provide this information.

The assumed stormwater treatment does not address long-term effects.

The FEIS states that under the LPA, "stormwater runoff from all existing, new or reconstructed impervious surface area within the CIA would be treated, while stormwater runoff from most of the existing PGIS does not currently undergo stormwater treatment."[76] The FEIS seems to describe stormwater treatment as the development of very large stormwater retention ponds, some surrounding the Rosemere neighborhood. Large bodies of standing water adjacent to residential areas is not healthy, and could result in mosquito problems. Rosemere has submitted various comments that groundwater mounding in the area has resulted in toxic buildup, and further injection or standing stormwater treatment ponds could contribute to the degradation of the creek as well as additional mounding. Yet, the FEIS includes mention of

[75] FEIS at 3-341.
[76] FEIS at 3-340.

for effect is thought to be approximately 1.5 to 5 mg/L. An increase of 0.01 pound equates to approximately 72.6 g. Over a 53-acre drainage area, this modeled increase is negligible, particularly considering that the majority of the stormwater would reside in drainage ditches and canals operated by MCDD prior to reaching any receptor fish. The CRC fulfilled its NEPA obligation to disclose known impacts, and to avoid, minimize, and mitigate where practicable.

The FEIS discusses total impervious areas on pages 3-341. Ruby Junction is not discussed in detail because its expansion will result in no new impervious surface associated with CRC, as stated on 3-342.

CRC acknowledges that even after treatment, pollutants from stormwater runoff may still be harmful to aquatic organisms. The statement that environmental conditions would be improved after retrofits is based on the fact that existing infrastructure allows stormwater runoff to flow completely untreated into streams. Treatment to current standards will improve water quality when compared to the same area that provides no treatment.

The commenter notes that the FEIS must take into account illegal pollution and failures by other entities to abide by their permits. These violations are not reasonably foreseeable events, nor can they be predicted with any certainty.

Cumulative impacts address basin-wide projects, as shown in FEIS Section 3.19.

O-002-019

injection. This fails to address the possible long-term effects of the proposed stormwater treatment and the concerns of the Rosemere neighborhood.

Analysis of the new and rebuilt impervious surfaces fails to analyze impacts under each of the non-preferred alternatives.

Exhibit 3.14-5 does not include information for all of the build alternatives. It is essential that the public can understand what the alternatives of the proposed action are, and what the differences are. This failure to provide analysis for each alternative frustrates the public's ability to understand the alternatives and their differences.

The FEIS fails to describe why the CRC Project staff is willing to accept environmental degradation as an option.

All federal action should consider impacts to the environment a significant factor in determining what projects to undertake. This FEIS demonstrates a possibility of pollutant loads increasing: "The Columbia Slough drainage . . . may experience a slight increase in dissolved copper under LPA Options A and B (0.01 to 0.02 pounds per year)."[77] At high concentrations, copper is acutely lethal to fish. Dissolved copper is a potent inhibitor of olfactory function in juvenile Coho salmon.[78]

The FEIS needs to more thoroughly analyze the impact of the proposed action to assess possible environmental harm. The FEIS needs to explain why the CRC Project staff is willing to allow increases in pollutants that may harm the Coho. As explained above, projected pollutant loads for each waterway should be included for all relevant pollutants. Even if the FEIS concludes that the loads are only slight, disclosure is still required. Slight changes to the chemistry of the water may have a significant impact. For example, the FEIS acknowledges that

[77] FEIS at 3-341.
[78] Baldwin, D.H., et al. *Sublethal effects of copper on coho salmon: impacts on overlapping receptor pathways in the peripheral olfactory nervous system.* Environmental Toxicology and Chemistry 22 (2003): 2266-2274.

O-002-019

the Columbia Slough does not meet Oregon State water quality standards for temperature, iron and manganese, and deicing materials that contribute to low levels of dissolved oxygen.[79] The FEIS needs to provide reasons why the staff is willing to allow environmental degradation as part of the project.

The FEIS needs to present the overall impact of the project as it relates to its existence in a dynamic ecosystem, and not just limit its disclosures to positively described outcomes and references to broad mitigation strategies.

The FEIS fails to summarize the actual amount of the total impervious area. In Exhibit 3.14.4, the FEIS demonstrates that the amount of impervious surface will increase due to the adoption of the LPA[80], but fails to explain why the Ruby Junction facility was not included in the exhibit. This is an area that will expand PGIS and the additions to this facility are within the scope of the project. The increase in impervious surface warrants full disclosure regarding impervious surface changes and the resulting impacts.

The Indirect Effects analysis does not adequately evaluate the current conditions of the water bodies. In the Indirect Effects section, the FEIS states that because all development that comes out of this project must comply with existing stormwater treatment regulations, the impacts to existing resources would be negligible.[81] However, regulations do not eliminate all pollutants; rather they decrease the amount that will impact the environment compared to if there was no mitigation at all. A large increase in pollutants in stormwater that has been treated could lead to a net increase of pollutants in waterways as compared to no build options. The FEIS needs to take into account illegal pollution and failures by other entities that may violate their

[79] FEIS at 3-337
[80] FEIS at 3-343.
[81] FEIS at 3-344.

O-002-019

permits, adding to the level of pollutants in the water bodies. Such an approach better complies with the protective measures that the Clean Water Act supports.[82]

The FEIS should disclose what the likelihood of certain pollutant loads will be. By stating that, "decreasing traffic congestion . . . *may* consequently reduce the amount of copper and other traffic-related pollutants currently carried by corridor stormwater runoff," the FEIS does not actually disclose the results of studies, but couches it in vague terms with the use of the qualifier *may*.[83] Such ambiguity prevents the public from being able to comment in an informed fashion.

The Hydrology analysis fails to aggregate effects.

The FEIS does not take into account other projects that may be occurring on the Columbia River. The cumulative impact of all projects could have a substantial effect on the water quality and hydrology of the water bodies. Cumulative impact, under NEPA, is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions."[84] In addition, "[c]umulative impacts can result from individually minor but collectively significant actions taking place over a period of time."[85] The FEIS improperly limits its cumulative impacts analysis to projects in the immediate project area rather than the watershed as a whole. In addition, the cumulative impacts analysis merely concludes that the "combination of impacts from the CRC project, regulations, and other foreseeable actions is likely to result in water

[82] 33 U.S.C. §1251.
[83] FEIS at 3-342.
[84] 40 C.F.R. § 1508.7.
[85] *Id.*

O-002-019 quality improvements relative to existing conditions" without analyzing the full range of cumulative impacts.[86]

The FEIS fails to adequately address impacts to Wetlands and Jurisdictional Waters.

O-002-020 ***Stormwater and other impacts are not adequately considered.***

The FEIS states that "[n]o project construction will occur in the Columbia Slough, Burnt Bridge Creek, or Fairview Creek waterways."[87] However, this is a false statement. The I-5 Corridor abuts the project footprint, and will be directly impacted by construction activities, including the development of stormwater treatment facilities, groundwater injection systems, and outfalls. Best Management Practices need to be implemented to diminish adverse impacts to natural resources.

Further, wetland buffers should not be ignored in analyzing impacts to wetlands. The FEIS states:

> The LPA project footprint would not encroach upon any delineated wetlands. However, the LPA footprint would encroach upon three wetland buffers: Victory Interchange (0.01 acre for LPA Option A and 0.05 acre for LPA Option B), Kiggins Bowl (0.3 acre), and Burnt Bridge Creek (0. 1 acre).[88]

Stormwater impacts have not been identified relative to wetland buffers. This means that the FEIS essentially conflicts itself, finding no impact to wetlands although buffer areas will be effected. The FEIS must disclose stormwater impacts on these sensitive areas, which are likely to affect the wetlands themselves.

[86] FEIS at 3-457.
[87] FEIS at 3-360.
[88] FEIS at 3-363.

O-002-020

The FEIS does correctly state that no construction will occur in the Columbia Slough, Burnt Bridge Creek, or Fairview Creek waterways. Construction will occur within the "watersheds" of these streams, but no construction will occur in the streams themselves. In addition, the project includes a portion of the I-5 corridor; it does not just abut it. BMPs would be implemented as part of the project as described in the FEIS, the Water Quality and Hydrology Technical Report, and Appendix A of the Water Quality and Hydrology Technical Report.

The FEIS is not contradictory in describing impacts to wetlands and wetland buffers. Both are regulatory defined areas, and no impacts within wetlands are anticipated. The project footprint does currently intersect with wetland buffer areas, although no stormwater treatment facilities are proposed to be constructed within wetland buffers.

References to the effects discussion for Burnt Bridge Creek are not clear. In particular, the statement that "impervious surface would not be sufficient to prevent all discharge to wetlands" is counter-intuitive. It is precisely because of impervious surfaces that stormwater treatment (both quantity and quality) must be dealt with at this site. The documentation of impervious surface area and treatment requirements are discussed in detail in the Water Quality and Hydrology Technical Report and Appendix A of this report.

With regards to the comment on long-term mitigation for ESA and other fish and aquatic species, the FEIS clearly states its mitigation commitments, including the implementation of mitigation and restoration activities at the Lewis River/Columbia River confluence and in the Hood River. In addition, impact avoidance measures including erosion and sediment control criteria are discussed.

The comment on flow control being necessary for MS4 permits draining

O-002-020

In addition, the FEIS states that "new impervious surface would not discharge untreated stormwater runoff into the wetlands, and the wildlife activities that may be impacted are already negatively affected by the urbanized environment."[89] However, impervious surface would not be sufficient to prevent all discharge to wetlands, especially near the SR500 interchange where multiple retention ponds are being planned. There is insufficient documentation to quantify the intense amount of stormwater that will be mobilized. To imply that Burnt Bridge Creek and its surrounding habitat is already doomed because of existing contamination is irresponsible, and undermines Washington State Department of Ecology's current program to establish a TMDL to remedy failed water quality standards for this urban stream. Taking the approach that new construction can't make anything worse is negligent.

The FEIS also admits that "[a]s with the existing bridge piers, replacement bridge piers in the Columbia River for the LPA may result in long-term impacts to aquatic species, including protected fish species."[90] However, there does not appear to be any discussion on how CRC plans to mitigate potential impacts to ESA species, including fish migration windows, turbidity control, and impacts from mobilized contaminants. Rosemere requested information from archives relative to the design and build of the Glen Jackson bridge, and CRC responded that no such records existed to cross compare construction impacts.

The FEIS concludes that "[t]he development and use of any of the staging and casting sites would meet all applicable stormwater requirements during and following utilization of the sites."[91] However, the FEIS has not identified which stormwater regulations are required, and

[89] FEIS at 3-363.
[90] FEIS at 3-364.
[91] FEIS at 3-366.

to the Columbia River and Columbia Slough is completely inaccurate. City of Vancouver, City of Portland, WA Department of Ecology, and OR Department of Environmental Quality have concurred that these receiving waterbodies do not need flow control treatments.

During the preparation of the Biological Assessment and consultation with NMFS, the potential for release of untreated stormwater was addressed in relation to its unlikely occurrence if permits and contract specifications were followed.

O-002-020

does not seem to be following NPDES mandates relative to flow control or MS4 usage piggybacking on other jurisdictional permits. Washington State requires flow control for all MS4 NPDES permittees. The CRC project will be using existing MS4 facilities within the City of Vancouver. Flow control is required per state law to all waters of the state, including the Columbia River. Yet, the FEIS states that flow control is not required for discharges to the Columbia Slough, North Portland Harbor, or the Columbia River.[92] It is in error to say that MS4 outflows are exempt from flow control standards. NPDES activities also have a direct correlation to ESA impacts, and such construction activity could result in a "taking" of protected fish habitat that would require remediation. There does not appear to be an analysis of these impacts involving NMFS, though it is acknowledged in passing.

Mitigation is not adequately addressed.

O-002-021

The CRC project must demonstrate how resources within the environmental overlay zones will be avoided and impacts will be minimized to the maximum extent possible; unavoidable impacts will require mitigation. This analysis is absent from the FEIS where it is required. Mitigation and avoidance under AKART is not included. This is a violation of NEPA mandates, and does not meet the standards of basic stormwater management requirements as prescribed by the Washington State Pollution Control Hearings Board. CRC's view that it cannot be penalized and held responsible for pre-existing conditions is a tactic to avoid compliance with current construction standards at the state level as well.

The mitigation site plan must demonstrate that the mitigation will replace all of the resources and functions affected and that a suitable mitigation site is owned by the applicant. It

[92] FEIS at 3-341.

O-002-021

The FEIS and its associated technical documents discuss in several places the measures taken to avoid or minimize impacts as required under local, state, and federal regulations. In those cases where impacts cannot be avoided, specific or conceptual mitigation measures are identified. The PEAC comment notes that "mitigation and avoidance under AKART is not included." The term "AKART" refers to "all known, available, and reasonable technologies". It is associated with State of Washington procedures completed during permitting, particularly in association with treatment of stormwater runoff. It is not a necessary element of the NEPA analysis. Nevertheless, the CRC project has completed preliminary phases of AKART through identification of known and reasonable technologies, a literature review, modeling of existing conditions, and screening of feasible alternatives, but has not used the “AKART” acronym in the FEIS. With respect to stormwater facilities, information adequate for FEIS-level review is present in the Water Quality and Hydrology Technical Report and its Appendix A. The CRC project has not attempted to establish its own standards for how compensatory mitigation can proceed. The use of a mitigation site and accounting for functional assessments is a highly collaborative process with multiple resource agencies. CRC has routinely met with regulatory agencies since 2005, providing project information and soliciting feedback on avoidance and minimization measures. Where impacts cannot be avoided, mitigation (including sites, values, and activities) were discussed with this agency group. While some regulations and procedures prioritize mitigation that is on-site and in-kind, recent policies and trends in permitting and mitigation have recognized the problems with this approach and have instead encouraged off-site and out-of-kind mitigation if that provides greater benefit such as better connectivity, higher priority functions, or other benefits. It is in this context that the state and federal resource agencies rated the Lewis River confluence project and Hood River channel reconnection project as high priority compensatory mitigation for the CRC project. Permanent in-water

O-002-021

appears that CRC's intent is to pillage in the existing construction footprint with the expectation that all will be forgiven by investing in a wetland bank. This should not be allowed. The FEIS states:

> The compensatory mitigation ultimately selected will be based on a functional assessment of adverse effects and replacement of equivalent functional value. The project mitigation will provide meaningful improvement in the size, amount, distribution, and quality of habitats relative to that which existed prior to implementation of the CRC project."[93]

This implies that CRC will establish its own standards on how it will determine where and when to employ mitigation work. Standards require mitigation be employed in the same kind of habitat under the same environmental conditions to ensure equal compensation, and CRC has not conducted area wide surveys to categorize habitat types that will be impacted, nor have they analyzed how the habitats will be valued per jurisdiction. Mitigation should be required within the same watershed at the subwatershed level, not at some distant undisclosed location, and the acre per acre ration is absent from the description. There is a passing mention of the "no net loss" scenario, but water flows in natural streams have not been identified to determine what "no net loss" is in actual terms, including those waterways listed for impairments. There are vague ratios provided for open water issues, but not for habitat issues, riparian buffers, or wetlands. CRC has identified an undisclosed Lewis River mitigation area, but this is at the opposite end of the county. The Columbia River in Vancouver is being affected, and the Lewis River mitigation idea is far too removed to be of any good to the impacted area.

The Troutdale Sole Source Aquifer Technical Report is outdated and insufficient, rendering those sections that rely on it inadequate.

[93] FEIS at 3-367.

impacts from the CRC project are approximately 1.5 acres of fill (bridge foundations), mostly in deep water areas of the Columbia River. The project could replace this relatively low priority and low value habitat with similar in-kind and on-site mitigation. However, this is an opportunity to mitigate with much higher value habitat in locations that will provide much greater benefit to salmon and other affected species such as smelt and lamprey (i.e., shallow water rearing habitat). The details on the Lewis River confluence and Hood River sites are located in Section 6 of the Ecosystems Technical Report.

O-002-022

Rosemere hit the high points of concern about the sole source report with comments submitted last year.[94] The concerns raised by Rosemere have been ignored, though they have

[94] The comments noted herein do not represent all of Rosemere's concerns, but begin to address substantial issues:
1) First, the report focuses on construction related impacts, and CRC appears to justify this focus as something specifically requested by EPA's July 2008 letter. We view EPA's letter more as a request for detailed groundwater characterization and discussion of potential impacts on the groundwater in the project area. This is not what CRC provided.
2) Long term impacts and benefits from storm water management should be evaluated – CRC only provides one paragraph. Currently, little stormwater is infiltrated in the project footprint (primarily in areas that will be added to the impervious surface). After build-out, a substantial proportion of the storm water will be infiltrated. Benefits of this are groundwater recharge. Impacts could be mobilization of on/off- site contaminants caused by a higher water table and/or changes in groundwater flow direction and rate caused by infiltration created groundwater mounds. There are noted groundwater mounds, some of which are known to be contaminated, within the Burnt Bridge Creek Basin. This is in addition to possible introduction of contaminants due to inadequate stormwater treatment.
3) The hydrogeologic characterization seems incomplete and general. Site specific detail is lacking which is important for a several mile long area which is likely to have local variations that could be affected by the planned focused infiltration of groundwater. Specifically, CRC only provides an outdated and very general groundwater contour map. They do provide a detailed depth to groundwater map taken form Clark Co GIS although this is again is outdated from 1995. Instead, calculations should have been included to subtract the topography and provide a detailed groundwater elevation map. An additional source could be the referenced groundwater model. The model should have been compared to actual groundwater levels to validate it's accuracy so both measured and modeled representation of the groundwater contours should be available. This is important because the description of groundwater flow is very general without this level of detail. Flow rate is not discussed, except in reference to modeled travel times to wells (1 to 5 years, very short). CRC should employ their own model and run their own groundwater mobility scenarios.
4) The characterization of Burnt Bridge Creek is questionable, and this is important because it defines the northern area of the project. The report states the creek is underlain by low permeability conditions because groundwater levels are lower to the south, but there is no evidence provided to qualify this statement. At a minimum, boring logs (along I-5) should be provided as well as detailed groundwater contours. It is just as likely that the lower groundwater levels to the south are caused by pumping at WS-3 and the lower topography than an undocumented lithologic change. Therefore, additional characterization is needed to clear this up.
5) There is an indication that stormwater cannot be treated and infiltrated from the area between Mill Plain Blvd. and Fourth Plain Blvd. because the storm drain is too deep. There should be a better answer to this problem than the mere claim that infiltration cannot be achieved, and more effort needs to be made to find an appropriate resolution to this problem.
6) The city of Vancouver's local CARA ordinance is mentioned, but there does not seem to be a

O-002-022

The CRC FEIS and its associated reports, including the Troutdale Sole Source Aquifer report, provide the most up-to-date, verifiable information available at the time of publication. These were prepared in coordination with EPA. Construction activities are the potential impact pathway of concern.

Burnt Bridge Creek would not be impacted and therefore is not studied in detail. The project has identified potential for impacts and proposed measures to isolate known or potential contamination from reaching groundwater. PEAC notes that additional studies have been performed by CRC and others. These results have been incorporated into the most recent designs for structures and stormwater facilities as described in the FEIS.

PEAC has commented that the bridge footprint in itself is comprised of a liquefaction zone. Potential liquefaction of soils from construction activities were not addressed in the FEIS. Based on the results found in Section 5.2 of the In-water Test Pile Program Vibration and Sound Monitoring Final Report (http://columbiarivercrossing.com/FileLibrary/TechnicalReports/CRCTestPileAcousticVibrationReport.pdf) from July 29, 2011, impact and vibratory installation of pile could not be detected above ambient levels at several locations (including the existing bridge towers), while one monitor did detect vibrations on Hayden Island. Based on the finding on page 6-1 of the report that “[g]round vibration amplitudes are expected to be well below the amplitudes necessary to cause any damage to structures” this project element did not rise to a level where discussion in the FEIS was warranted.

O-002-022

technical merit, and EPA does not appear to be seeking answers. Because the FEIS chapters on Water Quality and Hydrology and Geology and Soils seem to replicate the Troutdale Sole Source Aquifer Technical report almost verbatim, these comments pertain to the noted chapters as well.

The Sole Source Aquifer Technical Report is clearly out of date and lacks sufficient detail in the designated protected area. Several years of drilling have occurred which should give much more detail to the lithologic model. CRC project staff has had plenty of time to gather water level data, analyze this data and present a clearer understanding of ground water flow. The Ground Water remediation efforts at the Swan Manufacturing site should be revisited now that they have a couple years of operational data. This should include recalibrating the CRC groundwater model, but it does not. The Swan manufacturing site is being treated under supervision of the Washington State Department of Ecology, so there should be better data available for CRC to use – however CRC's FEIS fails to identify existing baseline studies for consistent analysis.

Further, the reports do not address the currently proposed project – there is a new alignment over the river, a different design implemented, and the SR500 interchange has been removed. There are various blanket statements that are not specific enough to address the noted changes in design. The statement that finer grained material at Burnt Bridge Creek reduces

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plan to engage with the City of Vancouver on this subject. Since the CARA ordinance states that all infiltrated stormwater will enter drinking water wells in less than 5 years, it seems like Vancouver should be directly involved. Vancouver might want to engage on is integration of stormwater improvements in the surrounding area with the CRC project. CRC seems to be strictly isolating itself form it's surroundings where integration might serve the community well, including enhancing recharge of city well fields. After construction such improvements may be impossible. Collaboration is needed here, not isolation.
7) The referenced groundwater model is interesting, but one figure seems incomplete. A couple wells don't seem to be turned on in the
model (Great Western Malting) which would affect the result. The model identifies 35 wells in the area, but they are not all accounted for in the model.

O-002-022

infiltration south of the creek is questionable. Of course there is infiltration south of the creek, and CRC plans to use this capacity to infiltrate storm water. The notion that recharge occurs in the Cascades is irrelevant and the modeled flow lines to municipal well WS-1 appear to show the overwhelming importance of local recharge to the primary use of groundwater under the project. The flow lines appear to show that the project area will essentially control water quality at municipal well WS-1, and to some extent water quantity. Yet, CRC maintains that there are no impacts to the aquifer, even though direct impacts are expected at municipal wells. This is a very important conflict that needs to be resolved in order to prevent adverse impacts to Vancouver's water supply.

In addition, it makes storm water treatment and infiltration extremely important. CRC's statement that in the summary that "Improved storm water quality is *thought* to help improved surface water and groundwater quality over time" is alarming. A more affirmative statement based on experience would give more confidence. Stormwater treatment and infiltration is extremely important. There is a fair amount of discussion about stormwater management but it is lacking in detail. There is going to be a lot of runoff and some quantification of the amount of pollutants CRC expects and the capacity of the proposed treatment methods would give more confidence that they have a handle on this. A casual look at the pond near the foot bridge over I-5 shows what the concerns are. Fortunately they describe this pond as a detention pond not suitable for treatment.

One thing that is not identified is the affect of ground shaking during pile driving. CRC does state that they consider an alteration of "the physical characteristics of the groundwater resource" an adverse affect on the Troutdale Sole Source Aquifer. The bridge footprint in itself is comprised of a liquefaction zone, a seismic hazard, which is a primary

O-002-022

justification for needing a new bridge. There does not seem to be analysis of ground shaking during pile driving, and how that could impact liquefaction. Because the UGA and alluvium in the area are unconsolidated, ground shaking could alter the physical characteristics. It is conceivable that this could mobilize contaminants or damage municipal wells. For example, PCE is present in the groundwater from municipal well WS-1 from an unknown source. PCE could be mobilized by consolidation induced by ground shaking. Rosemere has brought this to the attention of the EPA on several occasions, yet these concerns have been dismissed, even though there are various artesian upwellings in the footprint area that directly impact the water supply. Vancouver should be very concerned about this.

The general impression is that CRC recognizes that the aquifer is vulnerable but it is questionable whether they have a sufficiently detailed understanding of the aquifer and flow system and the potential impact to groundwater. The main long term concern is storm water treatment which CRC seems to treat as an engineering problem to be addressed at a later time. Generally it is good for the water supply to infiltrate stormwater, however this must be done well to avoid reduction of water quality. Contaminants of concern could be directly disturbed by construction. The potential affect of vibration should at least be acknowledged with references to other projects where there was a substantial amount of pile driving.

This is also of concern in the Hayden Island area where pile driving will occur down more than 200 feet, piercing the aquifer through toxic landfill, all within proximity to residential areas on the island. This item has not been sufficiently addressed, although CRC has been conducting core soil samples over the past year. The results of those samplings do not appear to be included in overall analysis of these concerns, and EPA has failed to follow up on these concerns. Instead, EPA offers the opinion that all documents provided by CRC are "adequate"

O-002-022

unless consultants need to be hired for more specifics. This does not make sense relative to the potential for adverse impacts. Due diligence has not been performed here and Rosemere's previous comments have been ignored.

AIR QUALITY

Flawed Underlying Assumptions Condemn the Air Quality Analysis.

O-002-023

Any projection of what will happen in the future must be based on assumptions. In the current economic and environmental climate in the greater Portland Metro Area, we cannot waste scarce transportation dollars on false assumptions. CRC uses an assumption that air pollution decreases in the project area to avoid any discussion of the impacts on air quality and public health of this massive road-building project. As discussed in numerous comments on the traffic analysis for the CRC, those assumptions are incorrect.

The FEIS follows the DEIS in its reliance on Metro's 2035 Regional Transportation Plan (RTP). The RTP is only workable after underestimating future traffic projections and assuming no growth. In fact, the CRC project team previously asserted:

> [T]he [Metro] modeling indicated that fewer trips would cross the river and the duration of congestion would be substantially lower with the project. The air quality modeling presented indicates that fewer trips combined with less congestion would reduce pollutant emissions relative to the no-build. The induced growth analysis indicated that the project would be very unlikely to result in induced sprawl.[95]

The CRC project team fails to provide any explanation or analysis to support Metro's modeling, but instead continuously repeats Metro's predictions. The CRC project team unjustifiably uses Metro's modeling results as the project's go-to answer for almost any air quality concern raised.

The FEIS ignores that, at best, the CRC shifts congestion from the North Portland and Vancouver area into the Portland city center and north of Vancouver. No discussion is provided

[95] DEIS Comment Response to O-035-087.

O-002-023

CRC stands by the traffic numbers and subsequent air quality results. The air quality FEIS section and technical report analyses were developed and approved through an interagency consultation and relies on sound and established practices for the analysis. The FEIS and technical report disclose the impacts from various pollutant, indicates historical and expected trends in impacts, and considers differences in the future impacts. Since the emission differences between build and no-build scenarios are so small and are much smaller than the projected reductions due to regulations and technology, the additional evaluations contain large uncertainties and would have questionable benefit.

PEAC comments that "sources may increase their emissions at any time to allowable levels without undergoing any further permit review or the installation of new technology", and somehow will results in a NAAQS violation that CRC has not considered in detail. However, large stationary sources both up and downwind of the CRC project have shutdown and their emissions removed from the air shed. New sources and many existing sources have to demonstrate compliance with the NAAQS in order to get their permits. Thus, CRC presumes that any new or modified source being brought into the air shed will have demonstrated compliance with the NAAQS. Furthermore, with emissions reductions in effect, the future mobile emissions levels in the CRC project area will be lower, further leading to improvements in the air shed. The CRC project is not responsible for speculating on how other emissions sources may or may not impact the NAAQS.

Concerning ozone, the TSD notes: "On a regional basis, differences between the future 2030 emissions for project alternatives, including the No-Build Alternative, are 1 percent or less, which is not a meaningful difference." Thus, CRC's contribution to ozone is essentially too small to make a difference in terms of compliance with the NAAQS and in terms of health impacts.

O-002-023

on how the CRC will impact neighborhoods surrounding I-5 south and north of the project area, or in those sections of the project area where interchange improvements will drive more and heavier traffic farther away from I-5.[96] At worst, the CRC will enable a massive increase in car, light truck, and heavy truck traffic.

Even if the CRC's conclusion that traffic will not increase proves true, the FEIS' air quality analysis looks to area-wide air quality for year 2030 – ignoring the next 29 years. In 2030, air quality in the project area is projected to improve, due to in large part to regulatory requirements and advanced technology. The FEIS states, "Recent regulations, including those for fuel formulations, help control emissions from heavy-duty diesel on-road and off-road vehicles. New gasoline reformulation rules should substantially reduce benzene emissions. These standards are expected to continue reducing pollutants in vehicle emissions over the next 25 to 30 years." FEIS at 3-276. These improvements, if they happen at all,[97] would occur gradually

[96] Both the DEIS and the FEIS provide emissions analysis for four subareas adjacent to I-5. The project team identifies the four selected neighborhoods as: (1) NE 99th St. and E 39th St. in Vancouver, (2) E 39th St. to State Route 14 in Vancouver, (3) State Route 14 to Columbia Blvd. in Portland, and (4) Columbia Blvd. to the I-405 junction in Portland. However, neither the DEIS nor FEIS explain how or why the project team selected these specific neighborhoods as opposed to other neighborhoods along I-5. In particular, the FEIS should have included information on pollution impacts north and south of the project area, where the congestion now experienced along the Interstate Bridge will occur. The multi-lane project area will have a far greater number of lanes than I-5 north and south of the project area. Thus, while cars and trucks may have plenty of room to cross the river at 70 MPH, congestion will be experienced both north and south of the bridge where the road will remain 4 to 6 lane interstate with a speed limit of 50 MPH.

[97] One need not look far to find evidence that projections of future regulatory improvements (i.e. pollution reductions mandated by any government authority) are almost always too optimistic. *See* Statement by the President on the National Ambient Air Quality Standards (September 2, 2011) (withdrawing the final Ozone NAAQS revision that would have been more protective of public health and the environment); HR 2401 and 2584, Sec. 462 (2011) (delaying or eliminating EPA rules to protect the environment from air pollution); E&E Daily, Green groups say Senate MACT bill worse than House version (July 21, 2011) (proposed senate bill would postpone or eliminate hazardous air pollution standards for ubiquitous "industrial boilers" and utilities); EPA, Light Duty Automotive Technology and Fuel Economy Trends: 1995 -2007 (September 2007) (noting a decrease in fuel economy from 1987 – 2004).

PEAC incorrectly asserts that the ambient benchmark concentrations (ABCs) are standards that CRC ignores. ABCs are defined in the Oregon State Air Toxics Program rule (Division 246, 340-246-0090) as:

Purpose. Ambient benchmarks are concentrations of air toxics that serve as goals in the Oregon Air Toxics Program... **Ambient benchmarks are not regulatory standards**, but reference values by which air toxics problems can be identified, addressed and evaluated. (emphasis added).

Oregon's Air Toxics Program address toxics by geographical area (like PATS), by source category (like mobile sources) and by safety net program for selected stationary sources. Thus, application of ABC's to individual projects like CRC is not intended in the Oregon Air Toxics Program. Furthermore, MSAT reductions are obtained by addressing statewide vehicle emissions rather than attempting to squeeze small and likely insignificant reductions specific projects.

Since Harriett Tubman Elementary School is adjacent to I-5, just a few miles from the CRC project, it represents representative sample of likely impacts within the project area. Furthermore, ABC's are based on a annual averaging time where the Harriett Tubman samples are a 24-hour concentrations. Therefore the direct comparison of 24-hour sampled concentrations to the ABC's is not appropriate. Difference in MSAT emissions between the build and no-build scenario is small, within the range on uncertainty. Thus, any major progress in reducing MSAT will likely come from vehicle emissions and not from a single project.

Under the transportation conformity rules (40 CFR 93.123 (c)(5)):

(5) CO, PM_{10}, and $PM_{2.5}$ hot-spot analyses are not required to consider construction related activities which cause temporary increases in emissions. Each site which is affected by construction-related activities

O-002-023

over this period. Impacts to air quality and human health would still be a factor in the interim. Similar to the DEIS, the FEIS does not acknowledge this because it fast-forwards to year 2030 with its projections.[98] No indication exists that 2030 will have the greatest air pollution impacts of all the years between now and 2030. In fact, it is reasonable to assume that the years with serious traffic disruptions will result in more air pollution than in 2030. By choosing 2030 as the relevant model year, the CRC project team underestimates several decades of impact on the communities surrounding I-5.

It is a truth universally acknowledged that all models are wrong, but some models are useful.[99] The longer the time period covered by the model, the more wrong it is likely to be. Considering the serious deficiencies of the model outlined in comments on the traffic projections, the air quality analysis might give those living in the CRC project area comfort, but fails to meet the NEPA standard to examine the environmental impacts of a proposed action. The EIS must describe the relevant pollutants, the *range* of expected concentrations, and the health and environmental impacts of those concentrations.

CRC failed to adequately respond to PEAC's DEIS comments.

The CRC project team failed to adequately respond to several of PEAC's concerns expressed in its DEIS comments. First, in Section O-035-088, PEAC commented that the DEIS "fails to consider the health effects of exposure to multiple criteria air pollutants and air toxics, and their possible synergistic effects." The authors of the response answered

> [T]he DEIS did consider these issues, Pages 3-275 through 3-277 and Section 3.10.2 explain, and the Air Quality Technical Report (Section 4.2.2 and 5.2)

[98] Analyses that focus on 2030 impacts: Regional NAAQS and MSAT Emissions projections, Subarea NAAQS and MSATS Emissions projections Maximum One-Hour and Maximum Eight-Hour Carbon Monoxide Concentrations Analysis, and the Intersection Ranking and Hotspot Analysis.
[99] With apologies to George E. P. Box and Jane Austen.

shall be considered separately, using established "Guideline" methods. Temporary increases are defined as those which occur only during the construction phase **and last five years or less at any individual site**.

Although construction will last more than 5 years, project construction activities at any one site are not expected to last more than 5 years. Thus, a CO hot-spot analysis was not conducted. Since the area is in attainment for PM_{10} and $PM_{2.5}$, a PM hot-points analysis was not required.

The air quality research conducted during the construction of the Dan Ryan Expressway is very relevant to understanding the likely impacts of CRC construction. The Dan Ryan project involved construction of a transportation facility with elements very similar to the CRC project, in an urban environment and through a wide range of meteorological conditions. The study spanned several years and included many samples covering many different types of construction equipment, and types and levels of construction activity. Through several years of construction, the monitoring did not detect any elevated concentrations that were directly related to the project. The CRC project is expected to have half the volumes of the Dan Ryan project. This information from the Dan Ryan project monitoring research supports the conclusions that CRC construction is not expected to cause any air quality violations and will not pose undue risk to the nearby communities.

See also responses to EPA's comment letter F-001-003 for additional discussion of air quality.

O-002-023

> further details, the relevance of such air-quality-related health risks to the project, including the known limitations and uncertainties of current science and methodologies, the information, findings and relevance of the Portland Air Toxics Assessment study, and the approach developed and implemented in coordination with regulatory agencies to address these concerns. Please see Chapter 3 (Section 3.10) of the FEIS and the accompanying Air Quality Technical Report for an updated discussion of these issues.

Needless to say, this overbroad response failed to resolve PEAC's concern. The pages referred to in the DEIS did not discuss the health effects of exposure to multiple criteria air pollutants. While each criteria air pollutant is now at least mentioned in the FEIS, the FEIS still does not address the health effects of multiple criteria air pollutants. Furthermore, the fact that the FEIS acknowledges that Volatile Organic Compounds and nitrogen dioxide contribute to the creation of ozone does not address PEAC's concern. Thus, the CRC project team failed to adequately respond to PEAC's comments in Section O-035-089 of the DEIS.

Next, PEAC raised concern in its comment about how the CRC project team avoids analyzing the effects of criteria pollutants. Specifically, in Section O-035-099, PEAC noted how "the DEIS essentially equates compliance with the NAAQS with a sufficient analysis of the air quality impacts of the project." In response to this, the authors state that

> The DEIS and Air Quality Technical report indicate that regional pollutant emissions from vehicles will continue to decrease in the future even though VMT increases, suggesting air quality will improve in the future. This is supported by air quality monitoring conducted by the state air quality agencies that shows most pollutant levels have decreased over the last ten years.

This response completely ignores PEAC's concern that the DEIS uses NAAQS compliance as a substitute for an analysis of the air quality impacts of the project. Thus, this response is inadequate.

The CRC improperly provides significant new information without completing an SEIS.

O-002-024

While the FEIS does provide new material to resolve uncertainties, it is not appropriate to introduce an overwhelming amount of new material in an FEIS. In such a situation where the CRC project team must introduce a vast amount of new material, the need for a Supplemental EIS (SEIS) is obvious. Nevertheless, the CRC project team failed to issue an SEIS. The Air Quality section explicitly introduces new information including: (1) a revised list of project area intersections with the greatest potential to experience air quality effects, (2) air toxics monitoring data from the Harriet Tubman Elementary School in Portland, (3) a study on the temporary impact of a comparable construction project, (4) updated MSAT emissions and concentrating models, (5) new guidance from the FHWA on the list of MSATs to analyze, and (6) new guidance from ODOT for mitigating construction impacts. Furthermore, the CRC project team illegitimately uses some of this new information to dismiss public concerns, which the public raised regarding the DEIS. Also, many of the FEIS adjustments still act as blanket assertions and conclusions without providing any meaningful analysis. This fails to meet NEPA requirements.

CRC's analysis of criteria pollutant impacts and conformity do not satisfy NEPA's mandate to evaluate impacts from the proposed action.

CRC's NAAQS analysis is insufficient to disclose and analyze the impacts of air pollution.

O-002-025

The CRC claims that "An air quality impact would occur with a violation of the NAAQS or SAAQS."[100] Thus, the CRC continues the fatal flaw of its DEIS – equating NAAQS compliance with a discussion and analysis of "impacts" under NEPA.

Criteria pollutants under the Clean Air Act are pollutants that EPA has determined "cause or contribute to air pollution which may reasonably be anticipated to endanger public health or

[100] Air Quality Technical Report at 2-2.

O-002-024

The information and updated emissions estimates added to the air quality section of the FEIS did not change any of the fundamental conclusions regarding impacts, the comparison of alternatives, regulatory compliance or conformity. The most substantive change to the air quality section was that the FEIS includes more detail than the DEIS regarding mitigation measures during construction.

O-002-025

Please see responses to comments O-002-023 and O-002-024 above.

O-002-025

welfare."[101] To date, EPA has made "endangerment findings" for six pollutants: particulate matter (PM, PM_{10}, and $PM_{2.5}$), ground-level ozone (O_3), sulfur dioxide (SO_2), nitrogen oxides (NO_x), lead (Pb), and carbon monoxide (CO). Once EPA makes an endangerment finding, EPA must then develop "air quality criteria" for that pollutant.[102] The criteria is intended to accurately reflect the latest scientific knowledge about effects on public health and welfare that can be expected from various levels of that pollutant in the ambient air.[103] Once the criteria are established, EPA must set National Ambient Air Quality Standards (NAAQS) to protect human health and welfare.[104]

The Clean Air Act requires that EPA establish an independent scientific review board (the Clean Air Scientific Advisory Committee or CASAC).[105] Every five years, the EPA and CASAC must review the criteria and the NAAQSA to ensure that they continue to protect public health and welfare based on the latest science.[106] If warranted, EPA must make revisions to criteria and promulgate new standards for each listed pollutant.[107] EPA is also required to involve the public in the criteria development and NAAQS review process by publishing notice in the federal register and reviewing public comments.[108]

Nevertheless, criteria pollutants often pose significant health threats even when ambient concentrations are at or below the national standard for three reasons. First, EPA does not

[101] 42 U.S.C. § 7408.
[102] *Id.*
[103] *Id.*
[104] 42 U.S.C. § 7409.
[105] 42 U.S.C. § 7409(d)(2)(A).
[106] 42 U.S.C. § 7409(d)(1) & (2)(A).
[107] 42 U.S.C. § 7409(d).
[108] 42 U.S.C. § 7607(d).

O-002-025

comply with its duty to review the criteria and NAAQS every five years.[109] Second, EPA has on at least two occasions rejected the NAAQS levels that CASAC has recommended as requisite to protect public health and welfare. Third, for some criteria pollutants, there is no level under which the population will experience "no impacts." Simply put, the more pollution present in the ambient air, the more death and disease associated with the exposure, even if the NAAQS are satisfied.

While PEAC did raise these concerns in its DEIS comments, it bears repeating since the CRC project team marginalized these concerns by stating that the project was compliant with NAAQS and nothing more could be done. Moreover, PEAC's concerns are highlighted by significant controversy around updated NAAQS that has continued since the DEIS was released in 2008.[110] While delays continue to plague the implementation of the final NAAQS revision for ozone, all available scientific evidence points to a significant revision downward of the ozone standard. Under an appropriate ozone standard, the project area is likely to be in non-compliance with the NAAQS, and the pollution increases occasioned by either construction related emissions or increased car and truck emissions, will pose an undue health threat even considering the CRC's false reliance on NAAQS compliance to demonstrate "no effects" under NEPA. If the

[109] *See American Lung Association v. Reilly*, 962 F.2d 258, 263 (2d Cir. 1992) (failure to review NAAQS for ozone); *Environmental Defense Fund v. Thomas*, 870 F.2d 892, 900 (2d Cir. 1989) (failure to review NAAQS for sulfur dioxide), *cert denied sub nom. American Lung Association v. Browner*, 884 F.Supp. 345, 346 (D. Ariz. 1994) (failure to review NAAQS for PM); *Center for Biological Diversity v. Johnson*, Civ. No. 05-1814 (D.D.C. filed 2005) (failure to review NAAQS for nitrogen oxides and sulfur dioxide); *Communities for a Better Environment v. EP*A, Civ. No. C 07-03678 JSW (N.D. Cal, May 5, 2008) (failure to review NAAQS for carbon monoxide).

[110] *See* Statement by the President on the National Ambient Air Quality Standards (September 2, 2011) (withdrawing the final Ozone NAAQS revision that would have been more protective of public health and the environment); HR 2401 and 2584, Sec. 462 (2011) (delaying or eliminating EPA rules to protect the environment from air pollution – including updated NAAQS) in Air Quality Citation Sources Folder.

O-002-025

CRC depends upon future regulatory action to demonstrate that pollution will go down, the CRC must also account for future regulatory action revising the NAAQS downward to reflect the scientific consensus that the Ozone and PM2.5 NAAQS are inadequate to protect public health and welfare.

Ignoring both the underlying scientific debate and the reality, adequately explained in PEAC's DEIS comments, that health and welfare impacts are experienced at pollution concentrations under the NAAQS, the CRC project team responds that "conformity rules state that the project must not cause or contribute to a violation of the national ambient air quality standards (NAAQS)."[111] Then the CRC project team asserts that "the project cannot arbitrarily set its own 'standards' under the current regulatory environment."[112] This assertion, without any explanation, assumes several faulty premises. First, the CRC project team does not provide any legal justification that precludes the team from disclosing impacts from air pollution in a NEPA document. Rather, the team simply says it cannot adopt standards because the NAAQS exist. The question, for NEPA purposes, however, is not whether the proposed action will meet regulatory standards, but whether the impacts of the project are adequately considered by the agency before making an irretrievable commitment of resources to a course of action.

Moreover, this response ignores that the Air Quality Technical Report does not reflect an analysis of whether the project area will attain and maintain the NAAQS. The Technical Report simply estimated the emissions associated with each project alternative and compared that to baseline. The logic seems to be that the project area is currently in attainment or maintenance of all the NAAQS as demonstrated by historical monitoring used for area designations under those NAAQS, thus is on-road mobile emissions are reduced in 2030 by the project (or under the no

[111] DEIS comment Response O-035-097.
[112] *Id.*

O-002-025

build alternative), the project must maintain the areas attainment status. Putting aside the many false assumptions in the traffic and regulatory analysis that results in the conclusion that on-road emissions will go down by 2030, the type of analysis in the Air Quality Technical Report proves nothing, and certainly does not demonstrate that the project area will experience "no effects" from the proposed project.

The Technical Report analysis depends upon the historic monitoring used to assess compliance with the NAAQS when area designations for those NAAQS first took place, and upon the limited ongoing monitoring for those pollutants. First of all, adding future project emissions to historic monitoring results cannot yield useful information about future compliance with the NAAQS because it does not account for permitted emissions that were not being emitted during the monitoring periods. That is, under the Oregon State Implementation Plan (SIP) programs regulating stationary sources, sources may increase their emissions at any time to allowable levels without undergoing any further permit review or the installation of new technology. The allowable emissions are set with reference to allowable emissions in some prior year, most commonly 1977 and 1978. Any stationary source with a permit limit set based on baseline emissions from 1977 and 1978 can increase its emissions up to that level.

Thus, historic monitoring results only indicate the air quality at that particular point in time based on what sources were operating at a particular level (often, not its allowable level). Therefore, the logic of simply comparing pre-project mobile emissions with post-project mobile emissions and concluding that the project will not cause or contribute to a violation of the NAAQS simply doesn't work in Oregon. Pollution may increase from other sources at any time, throwing an attainment area into nonattainment because increases are already authorized by permits. The Technical Report does not explain how its logic would apply if the area

O-002-025

experiences increases in pollution from other sources. Without undertaking a more sophisticated analysis, the TSD's conclusion that the project will not cause or contribute to a violation of any NAAQS is unsound.

Second, the CRC project team ignored other applicable standards, the Oregon Ambient Benchmark Concentrations. Indeed, the FEIS fails to discuss the health impacts expected from increased toxic air pollution, either from construction, congestion caused by construction, or the alteration of traffic volumes and locations as a result of the proposed action.

In addition, this simplistic "analysis" fails to seriously consider whether the project area will attain the new NAAQS that it identifies in exhibit 2-1 of the Air Quality TSD. The TSD recognizes that ozone status could change depending on what final ozone standard is adopted by EPA, yet it undertakes no further study of increased NOx emissions from roadways. Furthermore, the TSD notes that the monitoring stations that are monitoring NOx are not within a meaningful distance from the roadway, and further monitoring is needed.

Moreover, the NAAQS serve as a floor, not a ceiling. The existence of NAAQS does not prevent the CRC project team from disclosing impacts from pollution even where the NAAQS are attained. Particularly where there is great scientific controversy regarding the levels at which some NAAQS are set, such as is the case with ozone, the CRC must consider the significant health impacts that will occur at levels below the NAAQS.

Recently, EPA determined that the 8-hour Ozone NAAQS is inadequate to protect human health and the environment. 75 Fed. Reg. 2938 (Jan. 19, 2010). Specifically, EPA found that "children and adults with asthma and other preexisting pulmonary diseases are at increased risk

O-002-025

to the effects of O3 exposures." Draft Final Decision at 45.[113] The new 8-hour standard was expected to be adopted during the summer of 2011 and EPA was expected to set the new standard between 0.060 and 0.070 ppm.[114] Adoption of the final Ozone rule was delayed by the Obama administration due to concerns about the economic costs of the rule – not its health ramifications.[115] The impacts of ozone formation on communities in and around the project area are significant, and the CRC should have evaluated the likely new 8-hour NAAQS.

By once again relying upon compliance with the NAAQS instead of addressing EPA's scientific findings (and those of the CASAC) about ozone, the CRC fails to offer a rational conclusion on ozone impacts. Essentially, the Technical Report states that: "The impact of this proposed standard on the CRC project is expected to be minimal as the project is already included in estimates of ozone precursor emissions as part of the Portland Ozone Maintenance Area plan."[116] What is concerning, however, is that the Portland Ozone Maintenance Area plan presents a plan for continued compliance with the old 8-hour ozone standard, and was last updated in February 2007. The Technical Report does not demonstrate compliance with the old ozone NAAQS through modeling, and even if it had, such a demonstration would shed no light on compliance with the new ozone standards. Where EPA has found that people "with asthma

[113] Available at: http://www.epa.gov/glo/pdfs/201107_OMBdraft-OzoneNAAQSpreamble.pdf, attached in Air Quality Citation Sources Folder.
[114] After EPA set the 8-hour NAAQS at 0.075 ppm. "CASAC took the unusual step of sending EPA a letter expressing strong, unanimous disagreement with EPA's decisions on both the primary and secondary standards (Henderson, 2008). The CASAC explained that it did not endorse the revised primary O3 standard as being sufficiently protective of public health because it failed to satisfy the explicit stipulation of the Act to provide an adequate margin of safety." 75 Fed. Reg. 2938, at * (Jan. 19, 2010); *see also* CASAC, Review of the Agency's Final Ozone Staff Paper (March 26, 2007) ("*Ozone Panel members were unanimous in recommending that the level of the current primary ozone standard should be lowered from 0.08 ppm to no greater than 0.070 ppm.*" (emphasis in original)).
[115] The draft final rule is posted on EPA's website: http://www.epa.gov/air/ozonepollution/pdfs/201107_OMBdraft-OzoneNAAQSpreamble.pdf
[116] Air Quality Technical Report at 2-3.

O-002-025

and other preexisting pulmonary diseases are at increased risk" from ozone exposure, Draft Final Ozone Decision at 45, something more is required.

CRC's Conformity analysis is insufficient to disclose and analyze the impacts of air pollution.

O-002-026

The Project team must complete two steps in order to properly demonstrate conformity analysis. The first step is a regional analysis; this is when the project must be included in a conforming regional transportation plan and transportation improvement plan. The second step in this analysis requires the project to analyze the most congested intersections and demonstrate that, if the project is constructed, carbon monoxide levels (including carbon monoxide contributed by the project) will not exceed standards. The six intersections are: (1) E 39th St. at Main St. in Vancouver, (2) Mill Plain Blvd. at C St. in Vancouver, (3) Mill Plain Blvd. at I-5 Interchange in Vancouver, (4) Lombard St. at Interstate Ave. in Portland, (5) Fremont at MLK Jr. Blvd in Portland, and (6) Lombard St. at MLK Jr. Blvd. in Portland. Similar to the DEIS, the FEIS does not cite any authority nor provide any reasoning as to how or why the project team selected these intersections as the most congested intersections.

The FEIS fails to make clear that the conformity analysis does not require emissions from the demolition and construction period to be analyzed. As a result, the asserted impacts are inaccurate and incomplete because the conformity analysis pretends to reflect real emissions and pollutants within the ambient air. This demonstrates that just by fulfilling minimum standards under a separate and different regulatory requirement still does not amount to NEPA impact analysis.

FEIS fails to properly quantify NO_2 concentrations.

O-002-027

Despite EPA establishing requirements for an NO_2 monitoring network, the CRC project team fails to fully complete this mandated task. The FEIS misleadingly asserts that current

O-002-026

The conformity analysis is discussed and approach explained in the FEIS (Section 3.10) with further detail in the CRC Air Quality Technical Report. See also response to comment O-002-023, above.

O-002-027

The CRC project is not charged with conducting monitoring to establish the compliance status of roadways within the area. The FEIS does present data to indicate the likely compliance status, and also indicates that future NOx emissions will decrease, thus lowering future roadway impacts. As noted within the FEIS, the difference between the build and no-build emissions is very small and the impacts of the CRC project alone on local roadway emissions is likely to be small, within the range of measurement uncertainty. In addition, please see the response to comment O-002-023 above.

O-002-027

monitoring suggests the roadway NO_2 concentrations are below the proposed standard. However, none of the monitoring followed the regulatory requirement that it be conducted within 50 meters of a roadway. The CRC Project team admits in the FEIS that "additional monitoring will be needed to evaluate the *full* extent of roadway NO_2 impacts."[117] This admission is worthless for two reasons. First, the CRC Project team must include this information in the FEIS so that the public is fully aware of the CRC project's impacts. Second, the CRC Project team fails to provide any details, and even neglects to commit to additional monitoring to be in compliance with the new regulations. Thus, the CRC project team's NO_2 impact analysis is not only insufficient and incomplete, but is also not in compliance with Clean Air Act requirements.

O-002-028

The FEIS fails to adequately disclose or analyze impacts from Mobile Source Air Toxics (MSATs).

The FEIS makes the outrageous claim that:

> The Clean Air Act identifies 188 air toxics, of which MSATs are the subset emitted by mobile sources. Although MSATs pose potential public health concerns, there are no established regulatory limits for relevant MSAT pollutants.

FEIS at 3-273. On the contrary, the Oregon Environmental Quality Commission (EQC), the rulemaking body of the Department of Environmental Quality (DEQ), has established by rule Ambient Benchmark Concentrations (ABCs) for all six of the MSATs identified by EPA to be the most dangerous: benzene, 1,3-butadiene, formaldehyde, acrolein, acetaldehyde, and diesel particulate matter (DPM). The ABCs for these pollutants are:

Pollutant	Oregon ABC (ug m-3)
Benzene	0.13

[117] Air Quality Technical report for the FEIS at 2-3. (emphasis added).

O-002-028

The benchmarks are not regulatory limits. Please see the response to comment O-002-023 above.

O-002-028

1,3-butadiene	0.03
Formaldehyde	3
Acrolein	0.02
Acetaldehyde	0.45
Diesel particulate matter (DPM)	0.1
Naphthalene	0.03
Polycyclic aromatic hydrocarbons	0.0009

The CRC project team relied on Portland Air Toxics Solution (PATS), which is a Portland geographical region program attempting to reduce Oregon's air toxic pollutant concentrations. The FEIS states:

> As part of the Portland Air Toxics Solution (PATS) program, the DEQ (DEQ 2006) performed computer modeling to estimate and assess risks from 19 air toxics in the Portland-Vancouver metropolitan area, including the priority MSATs that the CRC project has evaluated. Although the PATS model is not intended for project-level analysis and is not connected to the CRC project, the PATS regional analysis provides perspective on the CRC results. The PATS study indicated that diesel exhaust, motor vehicles, and burning are important sources of air toxics in Portland. Regional modeling of on-road sources shows elevated benzene levels along freeways, with the highest concentrations in downtown Portland and in the Beaverton/Hillsboro area. Modeled formaldehyde levels show a similar pattern to benzene, except that the peak concentration for combined mobile sources is at PDX. The DEQ model indicated that diesel particulate matter (PM) concentrations from mobile sources peak in downtown Portland and are in the lower concentration range through most of the CRC's main project area.

FEIS at 3-277.

The FEIS' description of the PATS process is very misleading to those suffering from mobile source air toxic exposure in the project area. The FEIS tries to minimize the toxic air pollutant loading in the project area by claiming that air toxics are "in the lower concentration

O-002-028

range through most of the CRC's main project area." This easily leads to a conclusion that neither a current, nor future impacts from MSATs can be expected in the project area, a conclusion that is patently false. According to the PATS 2017 Modeling Summary for the 15 pollutants that will be over health-based benchmarks in 2017, the project area will be 5 – 10 times over the benchmark concentration for 1, 3 butadiene.[118] While this is lower than the projected concentration in downtown Portland, which will be over 10 times the benchmark concentration, it is hardly a "lower concentration range." For Benzene, even more of the project area is at 10 times or more over the benchmark concentration. These pollutants are probable human carcinogens, with a possible associations with heart disease. A reduction of 85% is required in all areas over the benchmark concentration, including those in the project area, to bring 1,3 butadiene and benzene concentrations down to safe levels.

For Diesel Particulate and PAH, the situation is even more dire, with the most densely populated portion of the I-5 corridor through North Portland exhibiting greater than 10 times the benchmark concentration or more. Diesel Particulate is associated with increased lung cancer, breathing and heart problems. PAH is a collection of chemicals containing one known carcinogen, and seven probable (Class B2) human carcinogens. Since Diesel Particulate and PAH come mainly from on and off road gas and diesel engines, including cars and trucks, construction equipment, ships, and rail sources, increases due to construction and construction-related traffic delays will impact residents in the project area regardless of the reductions that CRC assumes will occur by 2030 due to decreased trips across the river and better technology.[119]

[118] *See* PATS 2017 Modeling Summary in Air Quality Citation Sources Folder. Modeled concentrations in 2017 for each of the MSATs are included in this document.
[119] The concentration maps presented in the Air Quality Technical Report for these toxics are misleading because they present only the modeled concentrations from on-road and off-road mobile sources. This presentation ignores that the area affected by the CRC's on-road and off-

O-002-028

In short, the FEIS claims that the PATS regional analysis provides perspective on the CRC result, but the CRC analysis neglects to communicate any of the information developed in the PATS regional analysis, and provides misleading information about risks. Since the Air Quality Technical Report was completed, the PATS modeling has been completed and a final PATS report is close to release. Much more information about the air toxics impacts in areas affected by the CRC are available, and should be included in the FEIS or an SEIS.

The FEIS' reliance on the Harriet Tubman Middle School Monitoring Initiative to conclude that the project will not have impacts on sensitive populations is misplaced.

O-002-029

The CRC project team's reliance on results from an unrelated study to demonstrate CRC's air impact on sensitive populations is misplaced for several reasons. First, the study only monitored one school in the Portland area. Relying on the results from a single school neglects the impacts of the entire project area, including all of Vancouver. The FEIS fails to explain how results from Harriet Tubman Middle School comprise an accurate representative geographic sample.

Second, the Harriet Tubman study compared concentrations to "sample screening levels" (SSLs) that are significantly higher than the Oregon ABCs:

Pollutant	Oregon ABC (ug m-3)	EPA SSL (ug m-3)	Harriet Tubman Max Sample (ug m-3)
Benzene	0.13	30	2.247
1,3-butadiene	0.03	20	0.268
Formaldehyde	3	50	3.091

road mobile emissions will exceed the health-based benchmarks and the impacts of on-road and off-road mobile emissions will exacerbate those exceedances. By presenting only the mobile source emissions, the Air Quality Technical Report understates the baseline and the increase attributable to the CRC.

O-002-029

The results from EPA's study at Harriet Tubman are relevant. Please see the response above to comment O-002-023.

O-002-029

The Harriet Tubman samples exceeded all three benchmark concentrations, but were below the SSLs. Third, the Harriet Tubman study sampled air on 10 different days within a single 60-day period. Additionally, the Harriet Tubman analysis did not sample diesel particulate matter. Thus, the FEIS' reliance on the Harriet Tubman study fails to adequately describe how the CRC project will impact sensitive populations. In fact, the Harriet Tubman study actually demonstrates that concentrations, at least on some days, are higher than the Oregon ABCs.

The FEIS fails to adequately disclose and describe the temporary air quality effects of construction and congestion related construction.

O-002-030

While the FEIS acknowledges that all of the CRC build alternatives would cause short-term increases in air pollutant emissions, it fails to inventory which air pollutant emissions will increase or how much. The discussion does not include information about the specific pollutants that will increase and their associated health and environmental effects. Moreover, the FEIS continually attempts to minimize impacts without any basis in existing evidence.

The FEIS depends on inadequate mitigation measures to minimize the impacts of construction and construction related congestion emissions.

The FEIS depends upon mitigation measures to understate the impact of temporary emission increases from construction and construction related congestion. The FEIS fails to describe the mitigation efforts, however, simply depending upon future development of plans for mitigation. *See* FEIS at 3-283. The FEIS states: "For a project of this magnitude, the contractor will be required to develop a pollution control plan that includes documentation of operational measures that will be used to reduce emissions. Section 290 of the ODOT standard specifications describes requirements for environmental protection, including air pollution control measures." After locating and reading the ODOT specification section 290, it is clear that only one mitigation measure is required, a limit on idling diesel equipment, but the limit has so many

O-002-030

The research from the construction of the Dan Ryan Expressway is relevant to CRC. Please see the response above to comment O-002-023.

O-002-030

exceptions as to be made meaningless. Section 290.30(c)(1) of ODOT standard specifications states:

> **(1) Vehicle and Equipment Idling** - Establish truck staging areas for diesel-powered vehicles located where truck emissions have a minimum impact on sensitive populations, such as residences, schools, hospitals and nursing homes. Limit idling of trucks and other diesel powered equipment to five minutes, when the equipment is not in use or in motion, except as follows:
>
> • When traffic conditions or mechanical difficulties, over which the operator has no control, force the equipment to remain motionless.
>
> • When operating the equipment's heating, cooling or auxiliary systems is necessary to accomplish the equipment's intended use.
>
> • To bring the equipment to the manufacturer's recommended operating temperature.
>
> • When the outdoor temperature is below 20 °F.
>
> • When needed to repair equipment.
>
> • Under other circumstances specifically authorized by the Engineer.

This is the only measure included in the specification to mitigate air pollution increases from construction and construction related congestion. To ensure that real mitigation of temporary air pollution increases occurs, the FEIS must specify actual mitigation measures. Where will the diesel staging area be located to avoid impacting residences, schools, hospitals and nursing homes? How will exposures to pollutants from diesel combustion be minimized?

The FEIS erroneously relies on an inapposite study of an unrelated and dissimilar construction project to support its assertion that no impacts from construction will occur.

The FEIS depends upon a study of the Dan Ryan Expressway Reconstruction in Chicago, Illinois. While the Dan Ryan Expressway is the busiest expressway in Chicago, serving double the number of vehicles of the I-5 corridor, it still does not provide an accurate insight for the construction impacts of the CRC project.

O-002-030

First, the Dan Ryan Expressway is located in a non-attainment area for the annual particulate matter 2.5; the CRC is located in a maintenance area for carbon monoxide. Second, the city of Chicago is relatively consistent with natural flatness in the region, while the city of Portland is within the Willamette Valley, cradled by Mount Hood, Mount Adams and Mount Tabor. Generally, air pollution travels more easily in a flat geographic region compared to a valleyed geographic region. Third, Chicago is windy and located next to Lake Michigan while Portland is not windy and is inland. Finally, the Dan Ryan Expressway project monitored for only one relevant MSAT, PAH. PAH in Portland has been associated with residential wood combustion, as well as mobile on-road and off-road sources. A more reasonable measure of toxics impacts would include at least Diesel Particulate. Moreover, the CRC claims that no standards exists for MSATs, which, as discussed above, is false. Therefore CRC does not provide any comparison of the PAH emissions increases due to construction of the Dan Ryan Expressway to the Oregon Ambient Benchmark Concentrations.

As a result, the FEIS claim that "the results from the Dan Ryan Expressway project [indicate] that the CRC's construction activities should not result in any violations of the air quality standards and should not pose an **undue** health risk to the neighboring communities" is unfounded. The FEIS fails to provide an adequate analysis for the air quality impacts, and no analysis whatsoever for increases in cancer causing air toxic pollutants, resulting from on-site construction. Since the FEIS does not disclose what the impact of construction will be, the CRC's conclusion that no undue health or environmental risks will be present is a baseless conclusion. As described above, much of the project area exceeds or will exceed Oregon's Ambient Benchmark Concentrations for several MSATs when construction is occurring. Thus, any increase in these pollutants will have health impacts for some part of the project area

O-002-030

population, most likely the most vulnerable, children and the elderly. The FEIS' misleading and minimizing statements will provide cold comfort to those families who will be unduly impacted by air pollution from construction.

The FEIS fails to properly analyze the impacts of off-site staging and casting.

O-002-031

Although the FEIS acknowledges that the project's staging and casting construction activities may have associated pollutant-emitting sources, it avoids conducting a thorough analysis by relying on Air Contaminant Discharge Permits. This piece-meal strategy serves as an escape from fully disclosing the project's complete impact. As explained to earlier, this is further demonstrated by fact that the CRC project team did not consider construction related activities in the carbon monoxide hot spot analysis.[120] Thus, by not disclosing the project's full impacts, the FEIS is incomplete.

Furthermore, while this is an FEIS, the off-site construction plans have yet to be finalized. This is because the FEIS fails to identify the number of off-site locations the project needs, fails to explain the final purpose of the locations, and fails to provide actual off-site locations. Instead the FEIS states that the project "would require *at least one* large site to stage equipment and materials, and *could also require* a large site for use as casting yard for fabricating segments of the new bridges."[121] This information serves as a progress report, not a final statement. Additionally, the project team has not selected a specific site but rather provides a list of candidate sites. The potential sites include the Port of Vancouver Parcel 1A, Red Lion at the Quay, Thunderbird Hotel site on Hayden Island, Port of Vancouver Alcoa/Evergreen West, and Sundial. With only a list of candidates, the analysis is incomplete since different locations would impact different areas. This is further supported by the technical report's language

[120] 40 CFR 93.123(c)(5).
[121] FEIS 3-282 (emphasis added).

O-002-031

The project does not currently anticipate continual construction activity lasting longer than five years at any one site. Details about construction staging will depend largely on the construction plans that will be determined following the retention of a design-build contractor. Only then would any such impacts be quantifiable. Should it become evident that construction will occur continually at a given site for more than five years, then the project would conduct appropriate hotspot analysis at that time. Please see response to EPA comment F-001-003 on this topic as well.

O-002-031

distinguishing two sites from the other sites.[122] Thus, the temporary effects analysis is also incomplete and further fails to meet the NEPA requirements.

Under the transportation conformity rules (40 CFR 93.123(c)(5)), CRC must conduct carbon monoxide and particulate matter hot spot analyses for any construction activity lasting more than five years. CRC did not conduct a hot spot analysis for the potential staging areas, the Hayden Island interchange site or the local access bridge site, yet the FEIS fails to analyze the likelihood of concentrated construction activity lasting longer than five years. The health of local residents will be disproportionately adversely impacted should concentrated construction activity at the Thunderbird Hotel staging area, the Hayden Island interchange or local access bridge last longer than five years.

The FEIS fails to properly analyze Greenhouse Gas (GHG) impacts.

O-002-032

The FEIS claims that the LPA will result in a net decrease in GHG emissions compared to the No-Build Alternative.[123] The FEIS condems humanity to catastrophic climate change, concluding that "total emissions are expected to continue to increase for the foreseeable future." FEIS at 3-440. Certainly, there can no longer be any doubt that our climate is changing due to human sources of greenhouse gases. The composition of the atmosphere has been shifted to the extent that CO_2 levels are higher than they have been in the past 800,000 years.[124] James Hansen, a NASA climate scientist, tells us that to avoid catastrophic melting of ice sheets, CO_2

[122] Air Quality Technical Report 6-2. ("The proposed Port of Vancouver sites and the Sundial site are sufficiently far away from the project area that they would not have a direct effect on the project area.")

[123] The careful reader understands that the FEIS is only claiming a reduction in comparison to the no action alternative. See FEIS at 3-433. But the not so careful reader will believe that the FEIS is actually claiming an overall net reduction in GHG emissions. See FEIS at 3-444 ("the LPA is expected to reduce regional emissions"). This lack of clarity can be quite misleading.

[124] "Provocative New Study Warns of Crossing Planetary Boundaries," Carl Zimmer: Yale Environment 360, http://www.e360.yale.edu/content/feature.msp?id=2192 in Air Quality Citation Sources Folder.

O-002-032

See Section 3.19.10 of the FEIS, and the responses to GHG and climate change issues on pages 6-19 through 6-20. The EIS acknowledges that global GHG emissions are expected to continue to increase for the foreseeable future and that the cumulative impact is effecting climate change. The relationship between traffic speeds and fuel efficiency is integral to the EIS analysis of GHG emissions. The FEIS provides data showing that without the project there would be substantially longer daily durations of congestion on I-5, including much more stop and go traffic and traffic moving at less than 20 mph (pages 3-32 to 3-34). See response above regarding design speeds relative to GHG emissions. The GHG emissions estimates in the FEIS are based on modeling that includes changes in traffic speed projections throughout the day.

The CRC Energy Technical Report explains various assumptions of the energy and GHG emissions analytical methodology, including "weighted fleet mix" and "traffic stream composition". See the discussion beginning on page 2-16 of this report. Assumptions made for the model were based on best available information.

O-002-032

levels must be no higher than 350 parts per million. Today, the atmosphere contains up to 389 parts per million. If, as the FEIS claims, emissions continue to increase for the foreseeable future, any hope we have to preserve the livability of our climate is lost.

Contrary to the CRC project team, the President of the United States, the Oregon Governor, and the Oregon Legislature have recognized that global warming poses a serious threat to the economic well-being, public health, natural resources and environment of Oregon, the nation and our world, and are focused on developing policy solutions to the looming climate crisis. In January 2009, President Obama stood before the nation and called for a "new era of responsibility," promising that his government would "restore science to its rightful place" and "roll back the specter of a warming planet."[125] The President spoke of a clean energy future where "[w]e will harness the sun and the winds and the soil to fuel our cars and run our factories," built upon a strong and interlocking foundation of innovation and sustainability.[126] The U.S. Environmental Protection Agency has stated that the dangers presented by climate change are "not a close case" and "[i]n both magnitude and probability, climate change is an enormous problem."[127]

About five years ago, the Oregon Governor's Advisory Group on Global Warming issued a report calling for immediate and significant action to address global warming and to reduce Oregon's exposure to the risks of global warming.[128] The Oregon Legislature has adopted

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[125] *See* http://www.whitehouse.gov/blog/inaugural-address/ In Air Quality Citation Source Folder
[126] *See id.*
[127] *U.S. Environmental Protection Agency, Climate Change Division, Office of Atmospheric Programs, Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act,* at ES-1, 3-4 (April 17, 2009), available at http://epa.gov/climatechange/endangerment/downloads/TSD_Endangerment.pdf in Air Quality Citation Source Folder.
[128] Governor's Advisory Group on Global Warming, *Oregon Strategy for Greenhouse Gas Reductions* at i (2004) (available at

O-002-032

aggressive greenhouse gas reduction goals, declaring it to be the policy of the state to reduce greenhouse gas emissions in Oregon as follows:

> (a) By 2010, arrest the growth of Oregon's greenhouse gas emissions and begin to reduce greenhouse gas emissions.
> (b) By 2020, achieve greenhouse gas levels that are 10 percent below 1990 levels.
> (c) By 2050, achieve greenhouse gas levels that are at least 75 percent below 1990 levels.

House Bill 3543 (2007).

In order for Oregon, the nation and our world to "roll back the spector of a warming planet," global climate change must be a top priority for all transportation projects, as the transportation sector accounts for 38% of the total GHG emissions in Oregon. Oregon's aggressive greenhouse gas reduction targets are impossible to achieve without critical evaluation of massive transportation projects like the CRC. By taking forward thinking action, not fatalistically maintaining the status quo, the CRC can help prevent the transformation of Oregon from one of the most beautiful places on earth to what the Governor's Advisory Group on Global Warming described in 2004 as "**dramatically altered and far less habitable** within only a few generations."[129]

Climate Change is not just a problem for our children and grandchildren, however. Global climate changes are already occurring. In the Pacific Northwest storms are more frequent and intense, and heat waves, droughts and floods are more severe and frequent. In addition, Pacific Northwest temperatures have been rising since 1920, precipitation has increased 10% since 1916 with some areas showing as high as a 40% rise, the sea level is rising 1-2mm per year, glaciers

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http://www.oregon.gov/ENERGY/GBLWRM/docs/GWReport-FInal.pdf) in Air Quality Citation Source Folder.

[129] Governor's Advisory Group on Global Warming, *Oregon Strategy for Greenhouse Gas Reductions* at i (2004) (available at http://www.oregon.gov/ENERGY/GBLWRM/docs/GWReport-FInal.pdf) In Air Quality Citation Source Folder.

O-002-032

are rapidly retreating, and Cascade snowpack is melting earlier and faster each spring.[130] These changes in the water cycle, along with other global climate changes, threaten crops, salmon, recreation, fishing, and water supplies. Global climate change also affects the reproductive success, range, and diet of vulnerable species.[131] A recent study revealed that climate change may be responsible for widespread decline in Western forests.[132]

Prominent international organizations have released reports documenting the harm being caused by the accelerating climate crisis. The magnitude of human suffering that global warming is causing, and will cause, has repeatedly been underlined and amplified. A series of reports, including a magisterial call for action from the Lancet, one of the world's leading medical journals, lend even greater urgency to addressing health and welfare impacts ranging from flooded coasts to sweltering heatwaves to spreading diseases.[133] The Lancet Commission's study, conducted by top academics working jointly with University College London, made world headlines when it was released in May 2009 and concluded simply that "[c]limate change is the biggest global health threat of the 21st century."[134] Bigger, in other words, than cancer, AIDS, multi-drug-resistant tuberculosis, starvation, malaria, or pandemic flu. As the report puts it, "[e]ffects of climate change on health will affect most populations in the next decades and put

[130] *Scientific Consensus Statement on the Likely Impacts of Climate Change on the Pacific Northwest*, Consensus Statement drafted by a subcommittee of participants in the scientific meeting "Impacts of Climate Change on the Pacific Northwest" convened at OSU on June 15, 2004 at 4 (available at www.cf.org/westcoastclimate/E_OSU%20Consensus%20Statement.pdf).
[131] *See* IPCC, *Climate Change 2001: Impacts, Adaptation and Vulnerability* (2001), available at http:www.grida.no/climate/ipcc_tar/wg2/index.htm; IPCC, *Climate Change 2007: The Synthesis Report* (2007), available at http:www.ipcc.ch; NRC, *Climate Change Science: An Analysis of Some Key Questions*, (2001) (available at http://books.nap.edu/html/climatechange/) In Air Quality Citation Source Folder.
[132] Phillip J. vanMantgnm, *et al.*, "Widespread Increase of Tree Mortality Rates in the Western United States," *Science* Vol. 323 (Jan. 23, 2009) (available at http://www.sciencemag.org).
[133] *Anthony Costello et al., The Lancet Commissions, Managing the health effects of climate change, 373 The Lancet 1693, 1693 (May 16, 2009)* In Air Quality Citation Source Folder.
[134] *Id.*

O-002-032

the lives and wellbeing of billions of people at increased risk."[135]

Moreover, major climate-linked disasters are on the rise. "In recent years, more than 2 billion people were affected by natural disasters, many of which were directly or indirectly related to extreme meteorological phenomena, including heatwaves and coldwaves, floods, droughts, and windstorms."[136] Reinsurance giant Munich Re tracks such disasters and reports that in 2007 there were 960 major natural disasters – the highest number ever – and "more than 90% [were] the result of extreme weather-related or climate-related events."[137] The 2007 events were accompanied by 16,000 reported fatalities and $82 billion in economic losses.[138] Munich Re reports that "the number of great weather-related disasters has climbed from an average of less than two per year in 1950 to more than six annually by 2007. Over the same period, average annual economic losses have risen from less than $5 billion to more than $60 billion."[139]

Increasing CO_2 also causes acidification of the oceans. Acidic seawater interferes with the survival and growth of coral reefs and invertebrates because the acid dissolves the minerals these organisms need to build skeletons.[140] "According to recent surveys, the ocean is now acidifying 100 times faster than at any time during the past 20 million years."[141]

The FEIS' claim that the LPA will reduce GHGs is based on three primary factors:

1. tolling will decrease the number of cars crossing the River;
2. the LPA provides light rail that will divert some cars; and

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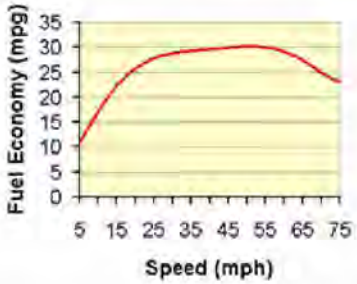
[135] *Id.*
[136] *Id.* at 1706.
[137] *Id.*; *see also* Ernst Rauch, Munich Re, *Effects of Climate Change on the Insurance Industry*, 26A Stanford Environmental Law Journal 239 (2007) in Air Quality Citation Source Folder
[138] Lancet Report at 1706.
[139] *Id.*
[140] "Provocative New Study Warns of Crossing Planetary Boundaries," Carl Zimmer: Yale Environment 360, http://www.e360.yale.edu/content/feature.msp?id=2192 in Air Quality Citation Source Folder.
[141] *Id.*

O-002-032

3. the LPA will reduce congestion, which will increase average speeds, which will reduce GHG emissions.

Obviously, the first two factors depend upon the validity of the CRC's traffic projections, as discussed above. The third factor, however, is patently false. The LPA is being built to accommodate 70 MPH traffic. As shown in the graph below, fuel economy is typically highest when traveling at speeds between 35 MPH and 50 MPH. The fuel efficiency of vehicles drops



precipitously after reaching 60 MPH.[142] Thus, the CRC cannot base its claim to reduced GHG emissions on the design speed of the project which is 70 MPH.

Moreover, the analysis of energy impacts contained in the Energy Technical Report is flawed for several reasons. First, the analysis used a national weighted fleet mix, rather than the regional or local weighted fleet mix. No data was provided to demonstrate that the expected fleet traveling across the River was similar to the national weighted fleet mix. Second, the analysis used weekdays in July as representative "typical" operating conditions. In the Pacific Northwest Climate, however, the use of July weekdays to represent "typical" operating conditions is inappropriate. Summer in the Pacific Northwest features excellent visibility and

[142] fueleconomy.gov

O-002-032 decreased traffic volumes due to school closures. Rainy, gray weather, on the other hand, which lasts for approximately eight months of the year in the Portland Metro area, is much more representative of "typical" operating conditions.

Using inappropriate assumptions about typical traffic patterns and a design speed at a non-efficient MPH results in an analysis that falsely claims that the LPA will decrease GHG in comparison with the no-build alternative. Of course, the GHG analysis suffers the same flaws as all of the analyses that are based on the CRC's erroneous traffic projections for 2030.

HUMAN HEALTH IMPACTS[143]

The FEIS Fails To Provide Adequate Analysis On The Impact Of CRC On Human Health:

O-002-033 The CRC has the potential to significantly affect public health in the I-5 corridor as well as in the surrounding neighborhoods and the I-205 corridor, but the FEIS does not provide adequate analysis that addresses public health concerns of the CRC. A project of the scale of CRC can have a huge impact on the ability of people to live healthy lives both during and after construction. Noise, air quality, mental health, physical activity, safety, access to fresh food, access to meet daily needs, social capital, housing quality, availability of affordable housing, and water quality[144] are all affected by transportation and have direct or indirect effects on public health. Adverse effects of living close to a major highway include a rise in asthma[145], diabetes,

[143] Cited articles are located in the Health Impacts Folder.
[144] Design for Health. Health Impact Assessment Preliminary Checklist Background and Instructions. Version 2.0. 2007. www.designforhealth.net
[145] Kim JJ, Smorodinsky S, Lipsett M, Singer BC, Hanigan AT, Ostro B. Traffic related air pollution and respiratory health: East Bay Children's Respiratory health Study. American Journal of Respiratory and Critical Care Medicine 170: 520-526 2004.

O-002-033

While EISs rarely include a chapter titled "human health", impacts to human health have been integral to NEPA analysis for the past 40 years, and they are integrated throughout the CRC NEPA analysis as well. The DEIS and FEIS analyses of impacts to air quality, noise, electromagnetic fields, water quality, groundwater, hazardous materials, and other factors are based on comparing the project's impacts to standards that have been established to protect public health. In addition, the analysis of impacts to land use, neighborhoods, biking, walking, traffic, safety, security, parks and recreation, public services, and visual resources also relate to public health. See the response to DEIS comments related to human health on page 6-30 of the FEIS, as well the Chapter 3 analyses of impacts to the human health-related issues listed above.

O-002-033

obesity due to decreased physical activity[146], cardiovascular disease, hypertension, injury, and mortality[147].

The current FEIS approaches human health impact as a minor side-effect of the CRC and only a cursory glance has been given to the health impacts, including on Environmental Justice populations. The FEIS fails to provide adequate information on the impact to human health in the Environmental Justice Technical Report, Indirect Effects Technical Report, Noise & Vibration Technical Report & Hazardous Materials Technical Report, or Air Quality Technical Report. Information provided on the positive or negative health impacts of the CRC is frequently unsupported by evidentiary data.

The FEIS fails to approach the issue of public health impact in a structured manner[148]. First, a baseline health status of communities affected directly and indirectly by the project must be established. Second, an analysis of the direct, indirect and cumulative public health consequences of the proposed project must be carried out. Third, potential mitigation measures must be identified, should any significant health impact be identified. Finally, the ways in which the health effects identified might disproportionately affect low income or minority populations, or children, must be discussed.

Legal Basis for Including Public Health Analysis in the EIS:

NEPA requires health impacts, including health impact related to economic and social effects, to be addressed in the EIS. The inclusion of a systematic approach to public health impact of the CRC is supported by NEPA, the regulations issued by the Council on Environmental Quality (CEQ), the agency in the Executive Office of the President charged with

146 Cohen DA, et. al.. Public parks and physical activity among adolescent girls. Pediatrics 118:1381-1389 2006.

147 Design for Health. Health Impact Assessment Preliminary Checklist Background and Instructions. Version 2.0., 2007. www.designforhealth.net

148 Wernham, Bear. Public Health Analysis Under The National Environmental Policy Act, 2010.

O-002-033

overseeing implementation of NEPA (Executive Orders 12898 and 13045), and available guidance on NEPA and environmental justice. NEPA requires that the FEIS include an analysis of the proposed project's human health impact and prohibits the agency from delegating the analysis to a separate agency external to the NEPA process.

NEPA expressly recognizes the interdependence of environmental quality and human health. NEPA states that the Congressional intent embodied in the statute is to "assure for all Americans safe, ***healthful***, productive, and aesthetically and culturally pleasing surroundings." 42 U.S.C. § 4331 (emphasis added). Among NEPA's fundamental purposes is to "promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate ***the health and welfare of man***." 42 U.S.C.§ 4321 (emphasis added). NEPA is intended to, "attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences." 42 U.S.C.§ 4331. NEPA is intended to apply to all federal actions "affecting the quality of the human environment." 42 U.S.C.§ 4332(c).

The NEPA regulations promulgated by the Council for Environmental Quality ("CEQ") also support the inclusion of a health impact analysis. In determining whether an effect may be significant, the lead agency must consider "[t]he degree to which the effects on the human environment are likely to be highly controversial." 40 CFR § 1508.27(b)(4). The CEQ regulations specifically define health as one of the effects that must be considered in an EIS. In defining "effects," the regulations state, "[e]ffects includes ecological, aesthetic, historic, cultural, economic, social, or ***health***, whether direct, indirect or cumulative." 40 CFR § 1508.8. The regulations instruct agencies to consider "the degree to which the proposed action affects ***public health or safety***" in determining significance. 40 CFR § 1508.27.

O-002-033

The United States EPA and CEQ have guidance documents on the requirement to analyze health impacts. These documents rely on the statutory provisions of NEPA and upon two Presidential Executive Orders. Executive Order 12898 instructs agencies to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse ***human health*** or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States. Executive Order 13045 states that agencies must, "make it a high priority to identify and assess ***environmental health risks and safety risks*** that may disproportionately affect children; and … shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks."

Health in DEIS & FEIS:

While the DEIS and FEIS reference health in several sections, they fail to adequately address the human health impact in the following ways:

Noise & Vibration: The Noise & Vibration Technical Report of the FEIS discusses in depth, the temporary and long-term effects of noise and vibration arising from the project and proposes several mitigation methods. However, there is no discussion on how noise and vibration, including cumulative levels, would affect, temporarily or permanently, the health of people in the surrounding communities, especially children and the elderly. A number of studies have shown that longterm exposure to moderate noise can increase stress, hypertension, blood pressure, heart disease, and sleep disturbances.[149]

Air Quality: The Air Quality Technical Report of the FEIS does not adequately address health risks associated with the project, citing insufficient/inconclusive data, which is unacceptable. Health of communities surrounding the affected area should be a pressing concern. The FEIS

149 Van Kempen EEMM, Kruize H, Boshuizen HC, Amelin CB, Staatsen BAM, de HollanderAEM. (2002). The association between noise exposure and blood pressure and ischemic heart disease: A meta-analysis. Environmental Health Perspectives: 110: 307-317.

O-002-033

needs to assess actual risk to human health through respiratory illness, asthma, cancer and other relevant health risks.

Obesity: The CLF-PEAC comments to the DEIS presented obesity as a cause for concern in the project. However, both the DEIS and the FEIS failed to address the overall impact of the project on obesity. While the FEIS addresses needs for bicycle and pedestrian-oriented design in the project, it needs to carry out an analysis of the impacts of such measures on whether the project provides greater opportunities to walk, bike or use public transit and the overall walkability of the surrounding neighborhoods. Walking, biking and public transit use have been shown to be associated with obesity, healthcare cost expenditures and overall lifespan.[150,151]

Construction Related Health Impacts: The FEIS states that with mitigation measures, there will be no adverse construction-related impacts on air quality or noise. The FEIS, again, fails to consider the impact of construction and related activities on people residing in neighboring communities – especially children and elderly who are more sensitive to health risks and other hazards that construction activities might pose. Also, the FEIS fails to provide a convincing argument that the air quality impact due to construction is fairly low. The Chicago highway example is cited as a comparable but no information is provided as to how the case study is relevant to this project.

Benefits of Including a Separate Public Health Analysis in the FEIS:

A complete analysis of health effects responsive to NEPA would consider all potentially significant direct, indirect and cumulative health impacts associated with the proposed action and alternatives and would include descriptions of baseline heath status and determinants of health for the affected population. The inclusion of a systematic approach to determining the public

150 Edwards, Ryan D. (2008) Public transit, obesity, and medical costs: Assessing the magnitudes. Preventive Medicine, 46 (1). pp. 14-21.

151 Frank L, Andresen M and Schmid T. "Obesity Relationships with Community Design, Physical Activity, and Time Spent in Cars." American Journal of Preventive Medicine, 27(2): 87–96, August 2004

O-002-033

health impact of the CRC would result in practical, evidence-driven recommendations that address identified health impacts.

A Health Impact Assessment (HIA) is a tool that could be used to address the potential public health impact of the CRC. An HIA[152] is a practical tool that can provide a structured process to determine a policy or project's impact on health; bring both immediate and long-term health benefits; and ensure that policy and project dollars are used efficiently to provide the greatest benefit.

Such an analysis would involve close collaboration between the decision makers on the project, public health experts, and affected communities. This analysis, which is currently lacking in the FEIS, can have several benefits[153]:

- By using sound, objective data gathered on health impacts, potentially unexpected health consequences and unanticipated costs can be identified and thus avoided.
- We can develop healthier communities by identifying design solutions that address the root causes of many prominent health problems like asthma, diabetes, and cardiovascular disease.
- It can build consensus by addressing the affected community's fears about the CRC transparently, by providing practical solutions and by engaging the community residents in the decision making process especially pertaining to health concerns.
- It can provide a clear, structured way to recognize the positive contributions of the CRC on the health of communities. It can also give the CRC committee an

152 Frequently Asked Questions. http://www.humanimpact.org/hia

153 Frequently Asked Questions about Integrating Health Impact Assessment into Environment Impact Statement. http://www.humanimpact.org/hia

O-002-033

opportunity to build productive and positive working relationships with the community and establish smart planning measures in the region.

- It will help ensure the CRC project meets its stated objectives.

Considerations for the CRC project must go beyond the freeway and infrastructure, and health must be an overriding consideration. Any change to the I-5 corridor should be viewed as an opportunity for repair and improvement of the current health situation. Understanding all of the health implications of the proposed project will help to advance better transportation policy. Conducting a Health Impact Assessment can ensure that the CRC is an improvement project for all stakeholders, especially impacted communities. Therefore, an HIA should be conducted to adequately address human health as a part of the FEIS, and the HIA findings should be used to provide evidence-based recommendations to help improve the health outcomes of the CRC project.

BICYCLE FACILITIES

O-002-034

The FEIS fails to explain how bicycle and pedestrian facilities are designed to meet the forecasted increases in alternative transportation. According to the FEIS, current demand of bicyclists and pedestrians on the I-5 bridge is 304 bikes and 64 pedestrians per day.[154] In the CRC's fact sheet regarding bicycle and pedestrian improvements, dated October 1st, 2011, by 2030 the number of bicyclists is expected to be 5000 and pedestrians 1000 per day.[155] Facing this 16-fold increase in alternative transportation use, the FEIS plans call for a path width of 16 to 20 feet, depending on the width of the overall structure.[156] The FEIS fails to explain why, despite significant anticipated growth, current plans call for a design width of just two feet wider than

[154] FEIS Traffic Technical Report, 5-28.
[155] CRC Bicycle and Pedestrian Improvements Fact Sheet, 3. Available at http://columbiarivercrossing.org/FileLibrary/FactSheets/CRC_Ped_Bike_Folio.pdf
[156] FEIS Chapter 2, 2-30.

O-002-034

The shared facility for pedestrians and bicyclists on the main span across the Columbia River is anticipated to be between 16 and 20 feet. At this stage of the design process, it is not possible to be more specific about the facility's width due to uncertainties about the details of the bridge structure and geometry.

The CRC undertook extensive analysis of existing and future use of the facility by bicyclists and pedestrians. This effort included developing a model that accounts for the mode split (auto, public transit, bicycle, walking) by travel distance. The Hawthorne Bridge, the highest use facility in Portland's bicycle/pedestrian extensive system, was the basis for this travel distance-mode split model. The CRC prepared pedestrian and bicycle forecasts for several scenarios. The pedestrian use forecasts for year 2030 varied from 600 to 1,000 daily walkers. The bicycle use forecasts for year 2030 varied from 900 to 6,400 users per day.

O-002-034

the minimum 14 feet standard for Oregon and Washington.[157] The lack of any discussion regarding the chosen width indicates an indifference to the quality of bicycle and pedestrian facilities. In fact the proposed path appears to use only about one half of the area under the "northbound bridge," and the FEIS does not explain what the other half of this area would be used for. If it cannot be used for bikes, is this hidden capacity for future vehicle traffic?

Further demonstrating the project's disinterest in alternative transportation, the FEIS contains glaring contradictions about the planned width of the bicycle path. As mentioned, Chapter 2 of the FEIS claims that the portion of the path over the river crossing "would be 16 to 20 feet wide, located within the superstructure above the bridge columns and below the bridge deck."[158] However, in the very same FEIS, the Traffic Technical Report claims the river crossing path "could be up to 24-feet wide, located within the superstructure above the bridge columns and below the bridge deck."[159] Also, the fact sheet on bicycle and pedestrian improvements claims "the path across the bridge will be 20 feet wide."[160] By providing confusing and contradictory claims about path width, the CRC literature fails to adequately inform the public about what it claims to be an important aspect of the project. The lack of attention to the design of the bicycle and pedestrian path confirms the claim that such facilities are merely lipstick on a mega-highway project pig.

As noted by the Portland Pedestrian Advisory Committee's June 18, 2010 letter (PAC Letter in Other Comments Folder), the CRC revisions to the LPA significantly curtailed bicycle and pedestrian facilities while at the same time maintaining essentially the same vehicle lane

[157] FEIS Traffic Technical Report, 5-28.
[158] FEIS Chapter 2, 2-30
[159] FEIS Traffic Technical Report, 2-32.
[160] CRC Bicycle and Pedestrian Improvements Fact Sheet, 3.

O-002-034

capacity.[161] Moreover those changes adopted a stacked design that moved the bicycle lanes to the enclosed underside of the bridge. Since 2008, the bridge pathway design has been stripped of most bicycle and pedestrian amenities. The design has gone:

–from two paths on either side of the bridge (at 12' and 26' wide) to just one
–from access at both sides of I-5 (which is very wide) in Vancouver to just on one
–from two elevators in the system to one
–from four or more viewpoints along the route to just one
–from 2 open-air, full-view paths to one that is deeply overhung and enclosed along half its length

Further, the quality of the bicycle and pedestrian facilities are always vastly overstated when the CRC presents them to the public:

–the path is touted as "twenty-four feet wide" when in fact it is only so at its flattest, straightest part – most of the route is just the DOT standard 16' wide
–travel distance on the planned path would actually be LONGER; it is more circuitous than today's route
–access to the path from Vancouver will require going up 5 blocks worth of corkscrews
–the under-bridge path is always depicted on a blazingly-sunny day at dawn, and never with a glimpse to the east, and the 200 feet of concrete overhang and multiple structural walls
–the under-bridge path is described as "world-class" despite the fact that no one else in the world has ever made the mistake of building one like it

These are changes that will have significant impacts on cyclists and pedestrians, yet they are not even discussed when the Federal agencies address whether changes to the LPA required a SDEIS. Apparently only changes that impact motor vehicles can be significant.

ENVIRONEMTNAL JUSTICE IMPACTS AND DIRECT IMPACTS TO COMMUNITIES

Rosemere Comments- Environmental Justice

[161] The FEIS rather conspicuously fails to disclose the actual width of the LPA bridges, see FEIS at 2-7 and 2-10, while at the same time disclosing this information for the other alternatives. This disparity in information is of course completely inconsistent with the CRC's insistence that it is providing greater detail and analysis regarding the LPA in the FEIS. The lack of information also creates the very real impression that the FEIS is hiding the true vehicle traffic lane capacity of the LPA bridges.

O-002-035

As the originator of Environmental Justice (EJ) Studies in Vancouver, Rosemere identified 17 west side neighborhoods that qualified (meeting EPA thresholds) as low-income/minority populations. At the Washington Elementary School in Rosemere, later renamed Rose Village, students in the subsidized lunch program rate in the upper 90th percentile, among the highest in the city. The history of EJ studies done by Rosemere is well documented. Further, the studies have resulted in Title VI complaints with EPA's Office of Civil Rights and a well publicized case in the 9th Circuit Court of Appeals where Rosemere prevailed, making national headlines.[162] To now see CRC staff disqualify EJ identification is disingenuous.

The FEIS concludes that the Shumway, Rose Village, and Esther Short neighborhoods are not identified as being "disproportionately below the poverty level."[163] EPA requested, in support of EJ studies, that CRC obtain data relative to elevated asthma cases in neighborhoods adjacent to the I-5 corridor in the construction zone. However, CRC simply responded that no such data was available and EPA has become complicit in allowing a lack of data to presume that no such EJ communities exist. Claiming that there is no time to gather information and research is also disingenuous given the years that have passed between the DEIS and FEIS. An article in the October 21, 2011 *Oregonian* illustrates that such information is readily available. *See EJ Oregonian*, Media Folder.

The use of the federal poverty line is inadequate to determine whether potentially impacted communities are low-income environmental justice communities pursuant to Executive Order

[162] **Rosemere Neighborhood Ass'n v. U.S. Envtl. Prot. Agency**, 581 F.3d 1169 (9th Cir. 2009); Jennifer Koons, Appeals Court Finds Widespread Failure by EPA to Investigate Civil Rights Complaints, N.Y. Times (Sept. 18, 2009), *available at* http://www.nytimes.com/gwire/2009/09/18/18greenwire-appeals-court-finds-widespread-failure-by-epa-78403.html.

[163] See FEIS Section 3.5.

O-002-035

The EJ analysis did not identify disproportionate high and adverse effects on either low income or minority populations. The CRC project study area is large and demographically diverse. The project has recognized that there are not only individual households in the study area that are minority or low-income, but that there are also areas that have comparatively high rates of EJ households. Refer to pages 3-135 through 3-137 of the FEIS where there is detailed information about which neighborhoods have the highest percentages of minority and low-income households. The project fully recognizes the presence of EJ households and the areas where the percentage of these households are comparatively high.

The project has not completed a survey of asthma rates in North Portland. The data on asthma and other human health conditions is only available at the state and county level. Such data will not help the project assess asthma rates near the interstate facility. Additionally, the air quality analysis demonstrates an improvement in air quality with the LPA over no-build and other DEIS alternatives, and compliance with all relevant air quality standards. The Oregonian article cited utilizes data related to percentage of free and subsidized lunches at schools within the study area. These data have been used to help characterize study area demographics since the DEIS.

Regarding the poverty line as a measure of low income status, USDOT guidance on EJ analyses require the use of the federal poverty guidelines as the threshold for defining low-income, and therefore, the maps and tables in Section 3.5 report these data. The project recognizes that an EJ analysis needs to look broadly at a community. The project has mapped community resources, coordinated with local housing authorities, and worked to accurately understand and characterize poverty in the study area.

O-002-035

12898 and the FTA's Draft Circular on Environmental Justice. CRC also has failed to comply with Executive Order 12898, requiring each federal agency to identify and address "disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

CRC initially convened a Community and Environmental Justice Group (CEJG) comprised of community residents and representatives from both Vancouver and Portland communities, including residents of diverse economic backgrounds and ethnicities. While agency obtained a veneer of diversity, the CEJG was not given a basic environmental justice training until two years into the process and precluded CEJG discussion of environmental justice concerns, including specific impacts, mitigation measures and community benefit agreements. CRC disbanded the CEJG prior to release of the DEIS.

Due to the significant disproportionate impacts on a low-income population, Executive Order 12898 and NEPA require CRC to conduct an alternatives analysis that avoids, reduces or mitigates such impact.

AQUATIC SPECIES/SALMON

THE BIOLOGICAL OPINION VIOLATES THE ENDANGERED SPECIES ACT.

The Endangered Species Act

O-002-036

Section 7 of the ESA requires that each federal agency ensure that its actions, and any action it authorizes, are not likely to "jeopardize the continued existence" of a listed species. 16 U.S.C. § 1536(a)(2). In fulfilling this mandate, each federal agency that undertakes, or is requested to approve, an action that may affect a listed species must consult with the appropriate federal wildlife agency – here NMFS. *Id.*; 50 C.F.R. § 402.14. Through this consultation process, NMFS must, using "the best scientific and commercial data available," 16 U.S.C. § 1536(a)(2),

The analysis and modeling of air quality documented in the DEIS indicates that future conditions with or without the project will receive a 30% to 90% reduction in emission of air toxics due to expected improvements in vehicle emissions technology and fleet changes. The project was shown to have a very small reduction in emissions.

The CEJG was chartered to address Community as well as Environmental Justice issues. Both sets of issues were addressed throughout the early years of the group's work. The group was trained in EJ issues, methods, and more at numerous times.

O-002-036

PEAC asserts that the National Marine Fisheries Service (NMFS) erred in its formal consultation of the CRC project under ESA. Because many of the comments relate to internal NMFS processes and procedures and NMFS regulatory compliance, FHWA and FTA cannot directly respond to those assertions. The following addresses PEAC's expressed concerns that relate to FTA and FHWA actions, including the NEPA analysis. While adherence to policies and regulations internal to NMFS is a NMFS responsibility, FTA and FHWA stand behind the Biological Assessment (BA) and agree with the Biological Opinion (BO) issued by NMFS. Several years of analysis, and pre-consultation and consultation with NMFS, resulted in project design and construction commitments that substantially minimize impacts to threatened and endangered species, as documented in the BO.

PEAC notes that critical habitat for eulachon was formally designated on October 20, 2011, about 10 months after the BO was issued for the CRC project and a month after the FEIS was issued. After coordinating with NMFS, FHWA and FTA sent correspondence to NMFS (on November 28, 2011) stating the intention to re-initiate consultation to address potential project effects on eulachon critical habitat. Re-initiation of ESA consultation on this critical habitat will occur after the final rule takes

O-002-036

provide its "biological opinion" on the impacts the action will have on listed species and whether as a result of those impacts the action is likely to jeopardize the species. *Id.* § 1536(b)(3); 50 C.F.R. § 402.14(g)(4).164 Thus, NMFS must (1) "review all relevant information," (2) "evaluate the current status of the listed species," and (3) "evaluate the effects of the action and cumulative effects on the listed species." 50 C.F.R. § 402.14(g).

The first step in this process is for NMFS is to define the "action area" which is "all areas to be affected directly or indirectly" by the action. *Id.* § 402.02. NMFS must then describe the "environmental baseline" as it exists within the action area, including the "past and present impacts of all Federal, State, or private actions and other human activities, the anticipated impacts of all proposed Federal projects in the action area . . ., and the impact of State or private actions which are contemporaneous with" the action. *Id.* The effects that must be considered include the "direct and indirect effects . . . together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline." *Id.* The Service must also evaluate the "cumulative effects," *id.* § 402.14(g)(3), which include the "effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area." *Id.* § 402.02.

Based on this information, NMFS must determine whether the action is likely to jeopardize the continued existence of the listed species. If so, the Service must provide a Reasonable and Prudent Alternative ("RPA") that will avoid that result. However, if the Service concludes the project is not likely to jeopardize the species, it must provide an Incidental Take

164 An agency action is deemed to "jeopardize the continued existence of a listed species" if it "reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." 50 C.F.R. § 402.02.

effect on December 19, 2011. In the meantime, the project team has reviewed the critical habitat listing and is investigating similarities between eulachon and salmon/steelhead critical habitat elements. At this time, it is believed that the CRC project may affect critical habitat for eulachon to the same extent as it affects salmon/steelhead critical habitat. That is, no adverse modification or destruction of critical habitat is anticipated. After the re-initiated consultation is complete for the designated critical habitat for eulachon, a re-evaluation will be prepared to determine if any supplemental NEPA evaluation is required.

PEAC asserts that the cumulative impact analysis for salmon in the FEIS is inadequate because it does not evaluate the impacts of non-federal future actions, and other deficiencies. Information related to the discussion of cumulative impacts and FHWA/FTA's responsibilities under NEPA and ESA are addressed adequately in the project documents. Section 3.19 of the FEIS discusses the combined effects of past, present and reasonably foreseeable future actions. The FEIS refers to, rather than repeating, detailed analysis in the BA and BO. The FEIS also looks at more than just federal actions when considering reasonably foreseeable future actions. In addition to the analysis NMFS provided for the BO, the FEIS considered the projected impacts of future climate change on fish and fish habitat, and the impacts of foreseeable, relevant major private and public actions, as well as general development and regulatory trends. The effects of such future actions are generally not quantifiable and therefore must be considered qualitatively. Where quantified information was available, it was considered. In addition to the FEIS, Sections 4 and 5 of the Ecosystems Technical Report provide over 140 pages of discussion on long-term and short-term effects on aquatic and terrestrial locations. In this discussion and the findings of effects, it is disclosed that there will be cumulative effects.

Regarding comments on the in-water work window, the standard lower Columbia River in-water work window is published by ODFW as

O-002-036

Statement ("ITS") that "specifies the impact of [the] incidental taking" that will occur as a result of the project. 16 U.S.C. § 1536(b)(3)(B)(4); 50 C.F.R. § 402.14(i).

Reinitiatation of Consultation

As a threshold matter, consultation must be immediately reinitiated so that NMFS may properly consider the impacts of the CRC on the newly designated critical habitat for the eulachon. 76 Fed. Reg. 65,324 (Oct. 20, 2011). NMFS' regulations implementing the ESA state that reinitation of consultation is required whenever "a new species is listed or critical habitat designated that may be affected by the identified action" 50 C.F.R. § 402.16(d). Failure to take this mandatory action is a clear violation of the ESA.

Indeed, this analysis is vital considering the significant impacts the CRC may have on eulachon's habitat. Specifically, when NMFS) listed the Southern Distinct Population Segment of eulachon as threatened under the ESA, dredging was recognized as a major impact to the species; habitat. *See Status Review Update for Eulachon in Washington, Oregon, and California*, Prepared by the Eulachon Biological Review Team (Jan. 20, 2010) ("Potential dredging impacts on eulachon consist of direct effects of entrainment of adults and eggs and potential for smother of eggs with sediment . . . Indirect effects may consist of alteration of freshwater spawning habitat and estuarine nursery habitat.") (citations omitted) in Biological Opinions Folder. According to NMFS, "[d]redging during eulachon spawning would be particularly detrimental, as eggs associated with benthic substrates are likely to be destroyed." *Id.* at 13019. Here, given the size of the pillars being driven and the related inwater work when placing these structures, the effects of the bridge construction are likely very similar to a dredging project. NMFS must carefully consider these impacts in its new Biological Opinion.

November 1 through February 28. The WDFW published work window for this area is August 1 through March 31. Most projects in the lower Columbia River reviewed by the Oregon office of NMFS use the November 1 through February 28 period as the work window. However, all three agencies may extend or contract those work windows based on project impacts. As an example, please see NMFS BO (#2004/01041) for Columbia Dredging that allows for maintenance dredging in deep water year-round between river mile 4.4 and 106.5, with only side-channel, shallow-water dredging restricted to the November 1 through February 28 period.

The CRC project has had extensive coordination with ODFW, WDFW, and NMFS (as an example, please note the agency coordination discussion in Appendix G of the CRC BA located at this link: http://columbiarivercrossing.com/FileLibrary/Biological_Assessment_Opinion/CRC_BA_24_AppG.pdf).Coordination with these agencies included discussion of multiple options for reducing effects, including the effects of timing of construction activities relative to fish run timing. By limiting all in-water work to just the November 1 through February 28 period, construction would extend from a 3- or 4-year period to over 7 years. Agency and CRC staff considered that this longer term of disturbance in the river would have caused more harm to natural resources than by conducting the activities in the manner and timing described in the FEIS. In particular, concentrating all work in the November 1 through February 28 standard in-water-work window would likely result in higher impacts to Columbia River chum and eulachon (if present) than under the currently proposed longer work window. The proposed work window decreases the intensity of hydroacoustic impacts on these ESUs while still remaining protective of other migrating fish by avoiding hydroacoustic impacts during the peak migration times of the fish that are considered highly imperiled. The proposed work window would allow no pile driving during those peak periods. While in-water work window options were discussed with the agencies, the BA does not evaluate a range of in-

NMFS' Biological Opinion Fails to Comply with the Endangered Species Act.

NMFS Has Improperly Constricted the Action Area and Inaccurately Described the Environmental Base Line.

O-002-036

To properly evaluate the effects of an action, NMFS must define the appropriate "action area" and establish the "environmental baseline" to which the project's impacts will be added. 50 C.F.R. § 402.02. NMFS limited the "action area" here to "(1) The area where underwater noise caused by pile driving will exceed background; (2) the lower Columbia River where dissolved and suspended pollutants caused by stormwater runoff from CRC is redistributed to the Pacific Ocean; and (3) the eastern Pacific Ocean where southern resident killer whales overlap with Chinook salmon from the Columbia basin." BiOp at 19.165 This constricted action area fails to satisfy the regulatory requirement that the action area include "all areas" that will be "directly or indirectly" affected by the project. Specifically, NMFS fails to include the significant upland areas that will be impacted by the CRC, and which in turn, will significantly affect the species at issue. NMFS must, given the nature, scope, size and location of this project, define the action area to include the true geographic reach of the project's impacts on the salmon. To accomplish this, the designation of the action areas must begin with an accurate description of the direct and indirect impacts resulting from the CRC. Only through a process of describing an action area that represents the full geographic scope of the impacts of the project on the species at issue will NMFS be able to accurately evaluate the impact this project will have on the species.

165 NMFS later describes the "action area" as "the lower Columbia River basin, that portion of the mainstem Columbia River and its tributaries downstream of Bonneville Dam to its Pacific Ocean terminus." NMFS does not explain why the "eastern Pacific Ocean" was dropped from this analysis.

water work windows, as alternative construction methods are not addressed in ESA consultations.

The DEIS Ecosystems Technical Report states that the project committed to "timing in-water work to occur outside of critical fish migration seasons" (page 1-10), but did not commit to working just in the November 1 through February 28 period. Through the agency coordination process the information on fish migration timing was refined; additional impact avoidance and minimization measures were developed and committed to; and the CRC project, with input from agencies, constructed a hydroacoustic impacts model to quantify potential effects on ESA-listed fish from impact pile driving. As shown in the FEIS, the Ecosystems Technical Report, and other reports and processes such as the BA/BO, it has been documented that impacts to fish have been avoided or are substantially minimized, allowing for work windows that are longer than the standard.

O-002-036

Furthermore, by unlawfully constricting the "action area," NMFS excluded many of the adverse impacts on salmon that must be considered as part of the environmental baseline. Specifically, NMFS fails to appropriately address the significant impacts the urbanization of the Columbia River watershed, and specifically the area from the Bonneville Dam to the mouth of the river, has had on the species at issue. As discussed below, in order to insure the species' long-term survival and recovery it is critical to preserve the species habitat, yet the Service has not adequately taken these factors into account.

NMFS Has Not Meaningfully Analyzed the Effect of the CRC on the species

The CRC is the largest construction project envisioned for the Columbia River in recent memory. Not that one would know that from BiOp. The curt analysis provided by NMFS on a project of this magnitude, a project which in size and scope is unprecedented since the listing of the salmon species in the area, falls well short of the intent and mandates of the ESA and is a disservice to species NMFS is charged with protecting.

Every BiOp must include a "detailed discussion of the effects of the action on listed species." 50 C.F.R. § 402.14(h). These effects must include both the direct effects, and the indirect effects "caused by the proposed action." *Id.* § 402.02. These impacts must then be added to the cumulative effects of other projects in order to ultimately consider whether this project may jeopardize the species. Here, NMFS has not properly analyzed any of these effects.

a. NMFS Has Failed to Address the Direct and Indirect Impacts the Crossing Will Have on the Species

To begin with, the he effects of an action that must be considered include the "direct and indirect effects . . . together with the effects of other *activities that are interrelated or*

O-002-036

interdependent with that action, that will be added to the environmental baseline." *Id.* (emphasis added). Here, NMFS admits that it has failed to undertake the appropriate analysis, stating "[t]he present level of planning for these actions is not sufficient to support a complete analysis of effects that are reasonably certain to occur on ESA-listed species or their designated critical habitats." BiOp at 19. NMFS' failure to address the effects is without question a fatal flaw that must be remedied before the action is authorized.

Moreover, NMFS' analysis of the direct and indirect impacts the CRC will have on the species addressed is flawed. For example, NMFS in its cursory analysis of the impacts of underwater noise during the construction of the crossing fails to acknowledge the true extent of the potential harm to salmonids. NMFS states "Modeling of the population-level effects pile driving, the primary source of impacts from CRC, shows that the magnitude and temporary duration of those effects will not increase the risk of extinction faced by these species." BiOp at 73.166 This conclusion is dubious because NMFS never fully addresses the impact of the activities authorized here. Specifically, NMFS focuses mainly on the mortality and injury that will from the action, but fails to address the impact to the species of the sub-leathal effects. According to NMFS, all fish will "may experience a temporary threshold shift in hearing due to a temporary fatiguing of the auditory system that can reduce the survival, growth, and reproduction of the affected fish by increasing the risk of predation and reducing foraging or spawning success" at sound levels equal or greater than 150 dB re: 1 μPa^2 BiOp at 62-63. NMFS further states that some activities will cause this level of underwater noise up to twelve miles away from the construction site. *Id.* at 58, Table 24. And, despite the clear limitations on in-water work established to protect salmon species—limitations not discussed in the BiOp—

166 NMFS' conclusion is suspect as it specifically admits previously that "this model was not able to assign those mortalities to individual populations." BiOp at 72.

O-002-036

such activities are allowed to occur year round for up to four years. *Id.* at 78. NMFS fails to explain how these known impacts that will affect all fish within the in-water action area will affect the populations.

Next, NMFS erroneously relies on unspecified and unproven stormwater best management practices (BMPs) to conclude that the CRC is unlike to appreciably reduce the likelihood of survival and recovery of listed species. BiOp at 73. In reality, Oregon and Washington's experience with Industrial General Stormwater Permits and Municipal Separate Storm Sewer System demonstrate stormwater discharges often fail to comply with established permit limits and therefore such permits regularly fail to protect water quality. While the goal of improving stormwater management over existing conditions is necessary, NMFS cannot rely on alleged or anticipated improvements in water quality without quantifying, or at a minimum, estimating the amount of pollution and quantity of annual stormwater discharges.

Furthermore, NMFS fails to meaningfully discuss any impacts, other than stormwater discharge, from the ongoing operation of the crossing. Specifically, NMFS fails to meaningfully address the impact the physical structures both during construction and once built will have on the river and its species. For example, the increased shade areas over the construction period and caused by the bridge itself will significantly alter the habitat it the area. These impact are given little or no consideration in the BiOp. Moreover, the BiOp does not address any noise issues related to the operation of the crossing. It is certainly conceivable that underwater noise created by the bridge will have onging impacts to the nearby habitat quality. In order to give "the benefit of the doubt to the species" required by the ESA, H.R. Conf. Rep. No. 697, 96th Cong., 2d Sess. 12 (1979), NMFS must address all known and potential impacts to the species. Its failure to do so here renders the BiOp arbitrary and capricious.

b. NMFS' Cumulative Effects Analysis Does Not Adequately Address the Many Impacts on the species

O-002-036

NMFS' cumulative impacts analysis is deficient as it wholly fails to address the effects of "future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area." 50 C.F.R. § 402.02. To analyze these impacts correctly, NMFS must describe all relevant future activities and *assess* how those activities would impact the species. *Id.* § 402.14(g)(4); *Greenpeace v. NMFS*, 80 F. Supp. 2d 1137, 1149 (W.D.Wash. 2000) (holding that mere listing of future activities without any explanation or analysis of how those activities may affect the listed species was not sufficient to consider cumulative effects). As a threshold matter, as noted earlier, NMFS' unlawful constriction of the "action area" significantly contributes to this flaw. By limiting the action area to only the in-water portion of the action area, NMFS has ignored upland actions that will occur in the immediate vicinity of the project that may have a cumulative effect on species impacted by the CRC. Indeed, although NMFS notes the likely population growth in the area and identifies some of the potential resulting consequences, NMFS fails to meaningfully address the impact to the area and the species.

The NMFS' Incidental Take Statement also Does Not Comply with the Endangered Species Act

As noted, if, at the conclusion of the consultation, the Service concludes that the action will not jeopardize the listed species, the Service must determine whether the action will result in

O-002-036

the "incidental take" of individuals of the species and what level of such take" will occur.167 Based on this analysis, the Service provides the agency with an "Incidental Take Statement" ("ITS"). 16 U.S.C. § 1536(b)(4); 50 C.F.R § 402.14(i). The ITS provides an exception to the prohibition against take established in Section 9 of the Act by authorizing the "incidental take" of a specific number of individuals of a listed species, where the take "result(s) from, but [is] not the purpose of, carrying out an otherwise lawful activity." 50 C.F.R. § 402.02; see also 16 U.S.C. § 1536(b)(4). An ITS must state the impact that the take will have on the species, identify the "reasonable and prudent measures" ("RPMs") considered necessary to minimize the expected impact, and establish "terms and conditions" necessary for implementation of the RPMs. 16 U.S.C. § 1536(b)(4); 50 C.F.R. § 402.14(i).

Here, the NMFS made two significant flaws in its ITS analysis. First, if NMFS had appropriately assessed the true impacts of this development on the species, it would have reached the singular conclusion that the development would result in the take of a significant number of species. However, as detailed above, the NMFS has failed at each step of the analysis and thus could not have accurately described the true amount of take that will result from this project.

Second, even had the agency properly evaluated the impacts, the ESA requires that NMFS specify the level of take that will occur. 50 C.F.R. § 402.14(i). An ITS must express the amount or extent of take in some form, either as a numeric value or as a surrogate ecological condition that has some connection to the taking of the species. *Arizona Cattle Growers' Ass'n v. U.S. Fish and Wildlife*, 273 F.3d 1229, 1250-51 (9th Cir. 2001). "Incidental Take Statements set forth a 'trigger' that, when reached, results in an unacceptable level of incidental take,

167 "Take" is defined to include engaging in or attempting to engage in conduct that will "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" an individual of a listed species. 16 U.S.C. § 1532(19).

O-002-036

invalidating the safe harbor provision, and requiring the parties to reinitiate consultation." *Id.* at 1249. Rather than comply with this requirement, with regard to take associated with underwater noise, NMFS failed to provide a cap for the amount of take that will occur. *See* BiOp at 77. To the extent NMFS attempted to set a take limit by describing the areas in which take will occur, this fails to comply the ESA as NMFS has simply restated the predicted impacts of the project, without establishing when an unaccpetable level of take is reached. *See Or. Natural Res. Council v. Allen*, 476 F.3d 1031, 1039 (9th Cir. 2007) ("The Incidental Take Statement and BiOp are rendered tautological, they both define and limit the level of take using the parameters of the project."). In short, without actually evaluating the level of this take, the NMFS has violated its obligation to insure that if the authorized level of take is exceeded, consultation will be reinitiated in order to protect against jeopardy.

THE FEIS's EVALUATION OF IMPACTS ON AQUATIC SPECIES VIOALTES NEPA AND THE ESA

The FEIS is so inadequate as to preclude meaningful analysis of salmon and steelhead issues.

The FEIS does not contain a valid and complete analysis of cumulative impacts to salmon and steelhead.

The FEIS is a NEPA document, and NEPA documents must "provide full and fair discussion of significant environmental impacts." 40 C.F.R. §1502.1. Accordingly, FHWA and FTA must take a "hard look" at the significant environmental consequences of the CRC Project. *Kern v. U.S. B.L.M.*, 284 F.3d 1062, 1066 (9th Cir. 2002). "A 'hard look' does not dictate a soft touch or brush-off of negative effects." *Native Ecosystems Council v. USFS*, 428 F.3d 1233, 1241 (9th Cir. 2005). Rather, agencies must "consider every significant aspect of the environmental impact of a proposed action," *Ore. Natural Desert Ass'n v. BLM*, 625 F.3d 1092,

O-002-036

1100 (9th Cir. 2010), which includes the cumulative impacts of a proposed action. *See* 40 C.F.R. §1508.25(c)(3).

A "cumulative impact" is "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. 40 C.F.R. §1508.7. A proper consideration of the cumulative impacts of a project requires "some quantified or detailed information; ... [g]eneral statements about possible effects and some risk do not constitute a hard look absent a justification regarding why more definitive information could not be provided." *Ocean Advocates v. U.S. Army Corps*, 361 F.3d 1108, 1128 (9th Cir. 2004)(*amended opinion*, 402 F.3d at 868).

A cumulative impacts analysis "must be more than perfunctory; it must provide a useful analysis of the cumulative impacts of past, present, and future projects," *Kern v. U.S. Bureau of Land Mgmt.*, 284 F.3d 1062, 1075 (9th Cir. 2002), and explain "how [] individual impacts might combine or synergistically interact with each other to affect the [] environment." *Klamath-Siskiyou Wildlands Ctr. v. BLM*, 387 F.3d 989, 997 (9th Cir. 2004). An agency can address impacts from past actions by providing specific information regarding the aggregate effects of those past actions, but the agency must still address whether and how those past aggregate impacts and the impacts of the agency's current proposal and likely future actions will have cumulative impacts on the environment. *See, e.g., League of Wilderness Defenders v. Allen* 615 F.3d 1122, 1136 (9th Cir. 2010).

O-002-036

Although a proposed action's impact may be minor, combined actions over time may be significant. 40 C.F.R. § 1508.7. Analysis must address combined or synergistic effects in addition to isolated effects. *See Klamath-Siskiyou Wildlands Ctr. v. BLM*, 387 F.3d 989, 997 (9th Cir. 2004). Analysis must be based on quantified or detailed information rather than vague or general statements about possible effects. *Ocean v. U.S. Army Corps*, 361 F.3d 1108, 1128 (9th Cir. 2004) (amended opinion, 402 F.3d at 868). Detailed discussion of such information ensures that the twin aims of NEPA are fulfilled, which are: (1) informed agency decision-making and (2) providing the public with useful information so as to allow public participation in the decision-making process and implementation of that decision. *Oregon Natural Dessert Ass'n v. BLM*, 625 F.3d 1092, 1099 (9th Cir. 2010). NEPA's "chief tool" to accomplish this is the EIS, id. at 11, which serves "to obviate the need for speculation," *Ocean Advocates v. U.S. Army Corps of Engineers*, 402 F.3d 846, 870 (9th Cir. 2005).

The Ninth Circuit has underscored the importance of cumulative impacts analysis. *See Kern*, 284 F.3d at 1076 (EAs require "adequate consideration of cumulative effects" and must be addressed "fully"). This is particularly true in an EIS, which "more thoroughly than an EA, [explores] the environmental consequences of a proposed action whenever 'substantial questions are raised as to whether a project *may* cause significant [environmental] degradation.'" *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1216 (9th Cir. 1998) (quoting *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1149 (9th Cir. 1998)).

The CRC Project FEIS acknowledges that a valid cumulative effects analysis must include an analysis of the incremental impacts of the proposed action together with the effects of other actions. Cumulative Effects Technical Report for the Final Environmental Impact

O-002-036

Statement at 1-11, citing 40 C.F.R. §1508.7. The FEIS then fails to properly analyze the past, present and future actions in the Columbia River Basin that will cumulatively add to the adverse impacts to salmon and steelhead. It is not enough to say that the CRC Project alone has a small effect on these species when the entire purpose of a cumulative impacts analysis is to take a hard look at all the *other* factors that influence ecosystem health. The FEIS fails to adequately disclose, explore or analyze any of these cumulative impacts on salmon and steelhead and is therefore in violation of NEPA.

The FEIS's cumulative impacts analysis is deficient in relation to salmon and steelhead in three major respects. First, it attempts improperly to tier with non-NEPA documents. Second, it fails to consider the effects of the CRC Project itself to salmon and steelhead beyond ESA-listed salmon and steelhead. Third, it fails to discuss the impacts of past authorized take of salmon and steelhead in any detail.

The FEIS's cumulative effects analysis impermissibly tiers to the Biological Assessment and Biological Opinion.

The CRC Project Biological Opinion's cumulative impact analysis is guided by the ESA rather than NEPA, which requires a significantly different and considerably narrower cumulative impact analysis. The ESA requires NMFS to only consider future non-federal activities that are reasonably certain to occur within an action area (*see* 50 C.F.R. § 402.02 (definition of cumulative effects)), whereas NEPA requires FHWA and FTA to consider *all* past, present, and foreseeable future actions, regardless of who performs the action, that combine with the proposed action to cause an incremental environmental impact (*see* 40 C.F.R. § 1508.7).[168] *See*

[168] NMFS itself recently recognized that an ESA cumulative impact analysis is "narrower than the NEPA definition of cumulative impacts." 73 Fed. Reg. 47869 (2008). Moreover, according to the Interior Solicitor, a cumulative impact analysis under the ESA may not consider certain

O-002-036

Portland Audubon Society v. Lujan, 795 F.Supp. 1489, 1509 (D.Or. 1992) (rejecting agency's request for the court to "accept that its consultation with the United State Fish and Wildlife Service under the Endangered Species Act constitutes a substitute for compliance with NEPA."); *Makua v. Rumsfeld*, 163 F.Supp. 2d 1202, 1218 (D.Ha. 2001) (highlighting lower standard applied under NEPA to determine whether an action will have the potential to cause impacts short of extinction and under ESA to determine whether an action will jeopardize). *See also Oregon Environmental Council v. Kunzman*, 714 F.2d 901 (9th Cir. 1983) ("[o]ne agency cannot rely on another's examination of environmental effects under NEPA"). Additionally, unlike a NEPA document, a BiOp is not subject to public comment and scrutiny by non-federal scientists.

The FEIS's Ecosystems section (section 3.16) refers the reader to Appendix K of the Biological Assessment for a "detailed description of estimated impacts to each run" of ESA-listed salmon and steelhead. *Id.* 3-393. Insofar as the FEIS fails to include its own detailed description of estimated impacts to salmon and steelhead, it cannot "tier" to the BA, which is not a NEPA document and is not even incorporated into the FEIS. *See League of Wilderness Defenders-Blue Mountains Biodiversity*, 549 F.3d 1211, 1219 (9th Cir. 2008) (remanding so the USFS can reissue its NEPA documentation to include the omitted, but clearly relevant, information); *Muckleshoot Indian Tribe*, 177 F.3d at 810 (noting that the 9th Circuit "[h]as

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future actions which might be likely to jeopardize a listed species, whereas a cumulative impact analysis under NEPA must consider these projects. Solicitor's Opinion M-36938, Cumulative Impacts under Section 7 of the Endangered Species Act, 88 Interior Dec. 903, 905 (1981). Additionally, the Solicitor determined, unlike under NEPA, the effects of possible future federal actions should not be considered as "cumulative effects" in determining ESA compliance because "all other future federal actions will themselves" be allowed to proceed only if they are later found to comply with ESA. 88 Interior Dec. at 905-07. Further, the preamble to the consultation rules acknowledged that NEPA "warrants] a more expanded review of cumulative effects" and that cumulative effects under the ESA are limited. 51 Fed. Reg. 19933 (June 3, 1986).

O-002-036

previously interpreted the regulations to allow tiering only to another environmental impact statement."); *Or. Natural Res. Council v. U.S. BLM,* 470 F.3d 818, 823 (9th Cir. 2006) (holding similarly proposed tiering impermissible because "the Watershed Analysis is not a NEPA document.").

Similarly, the FEIS attempts to tier to the Biological Opinion itself. *See* FEIS Cumulative Effects section 3.19, at 3-455. The Biological Opinion is not a NEPA document, either, and tiering to it is disallowed as well.

The FEIS's cumulative impacts analysis does not consider the impacts of the CRC Project to salmon and steelhead.

In terms of cumulative impacts, the FEIS's fundamental error is its failure to even consider, much less analyze, the cumulative impacts of the CRC Project along with the existing and likely future impacts of other activities in the Columbia River Basin. These ignored activities include other in-water projects and projects conducted out of the water which affect the watershed by increasing erosion, pollution runoff, or habitat destruction. The missing cumulative impacts analysis should have included both a more specific analysis of the cumulative impacts of these activities on salmon, steelhead, and other species, and a more general analysis of the cumulative impacts of the CRC Project itself and these other activities on resources such as wildlife and aquatic resources. The error here is quite similar to that identified in *Te-Moak Tribe of Western Shoshone v. U.S. Dept. of the Interior*, 608 F.3d 592, 603 (9th Cir. 2010), which invalidated an EA in which the cumulative impacts analysis focused primarily on the impacts of the proposal at issue and included only conclusory assertions of no cumulative impacts.

O-002-036

An interested reader might reasonably look for the FEIS's salmon and steelhead cumulative impacts analysis in the section titled "Cumulative Effects" (FEIS section 3.19). However, that reader would be disappointed because the Cumulative Effects section's "Ecosystems" subsection (FEIS subsection 3.19.18) is only four pages long. *Id*, 3-452 - 3-456. And, other than a discussion of the Biological Opinion's "no jeopardy" and "no adverse modification" conclusions, only *two sentences* out of those four pages are dedicated to considering the impacts of the CRC Project itself to ecosystems. Those two sentences are as follows:

> Although the direct effects of the [CRC Project] would include disturbances to native vegetation, trees, and wetland buffers, the most significant ecosystems effects of the [CRC Project] are changes to aquatic habitat. The [CRC Project] would significantly improve runoff water quality as a result of improved stormwater management, although its in-water bridge piers would have adverse effects on protected fish species in the Columbia River similar to the effects of the existing I-5 bridge piers.

Id. at 3-454. So, the analysis of cumulative impacts to ecosystems in the Cumulative Effects section is limited to an acknowledgment that the CRC Project will "disturb" native vegetation, trees, and wetlands, and that the aquatic habitat will be "affected." Specifically, the aquatic habitat will be affected by "improved" runoff water quality and by "adverse effects" from bridge piers. *Id.* That is all the information given on the effects of the CRC Project to ecosystems, including salmon and steelhead, in the Cumulative Effects section of the FEIS. This "analysis" does not satisfy NEPA.

O-002-036

The observant interested reader, however, will not be dismayed by the lack of information in the Cumulative Effects section itself. That reader will have noticed that the introduction to the Cumulative Effects section refers to that section's technical report, stating that "[t]he information in [the Cumulative Effects section] is based on more detailed information in the CRC Cumulative Effects Technical Report." *Id.* at 3-429. Accordingly, the reader will make his way to the Cumulative Effects Technical Report to satisfy his curiosity regarding the CRC Project's cumulative impacts to salmon and steelhead. Unfortunately, however, the reader will not find "more detailed information" regarding cumulative effects to ecosystems in the Cumulative Effects Technical Report. Rather, he will find *even less* information on ecosystems than was included in the Cumulative Effects section itself.

In the Cumulative Effects Technical Report, the impacts of the CRC Project to ecosystems are addressed in a mere *two paragraphs*. Those two paragraphs, in their entirety, are as follows:

> Although the effects of [the CRC Project] would include disturbance to native vegetation and trees and wetland buffers, the most significant ecosystems effects of the [CRC Project] are beneficial changes to aquatic habitat. The [CRC Project] would significantly improve water quality in area waterways as a result of improved stormwater management, although its in-water bridge piers would have adverse effects on protected fish species in the Columbia River similar to the effects of the existing I-5 bridge piers.
>
> The [CRC Project] would also remove the peregrine falcon habitat in the steel structure of the existing I-5 bridges. Whether these effects are temporary, with peregrine falcons reestablishing themselves on new bridge structures, or permanent, long-term adverse effects on the overall viability of the species are not anticipated.

O-002-036

Id. 3-1 to 3-2. Notably, the first paragraph is almost identical to the cumulative impacts treatment in the main Cumulative Effects section. The only real difference between the technical report language and the language in the main Cumulative Effects section is the addition of the second paragraph addressing peregrine falcons in two sentences. With analysis like this in the "more detailed" technical report, the reader wonders if he miscomprehends the meaning of the word "technical." This is not a detailed or quantitative discussion as required by NEPA. *See Ocean v. U.S. Army Corps*, 361 F.3d at 1128. NEPA requires more specificity than this. *See Kern*, 284 F.3d at 1076.

Having read the entire Cumulative Effects section and the entire Cumulative Effects Technical Report, and being left with no real analysis of the impacts of the CRC Project on salmon and steelhead, our hypothetical interested reader would likely be showing signs of wear. However, he might still take a hopeful glance at the Ecosystems section of the FEIS (FEIS section 3.16). Regrettably, however, the Ecosystems section is also extremely vague and does not, even once, use the word "cumulative."

What about the Ecosystems Technical Report, though? After all, the Ecosystems section says "[t]he information presented in this section is based on the CRC Ecosystems Technical Report." *Id.* at 3-371. Once again, however, the interested reader will be foiled. The Ecosystems Technical Report does not analyze *any* cumulative effects from the CRC Project. *Id* at 2-6. Instead, the Ecosystems Technical Report refers the interested reader to the Cumulative Effects Technical Report for an analysis of cumulative effects from the CRC Project, stating that "[p]otential cumulative effects from [the CRC Project] are evaluated in the Cumulative Effects

O-002-036

Technical Report. Please refer to [the Cumulative Effects Technical Report] for an evaluation of possible cumulative effects." *Id.* Alas, as already discussed, the Cumulative Effects Technical Report contains only two paragraphs relevant to the cumulative impacts of the CRC Project on ecosystems, including salmon and steelhead.

In conclusion, the FEIS offers a cursory and wholly inadequate treatment of cumulative impacts from the CRC Project to salmon and steelhead and therefore violates NEPA.

The FEIS's cumulative impacts analysis does not consider the impacts of numerous past and ongoing activities to salmon and steelhead.

The Cumulative Effects section of the FEIS (FEIS section 3.19) does not address past or present projects other than the CRC Project that affect salmon and steelhead. Rather than engaging in detailed analysis, the Cumulative Effects ecosystems section (FEIS subsection 3.19.18) reads like a general encyclopia article on ESA-listed pacific salmon. Rather than discussing any specific projects that adversely affect salmon and steelhead, the section offers an extremely generalized review of ESA-listed species and how climate change is likely to affect those species in the future. The section does cite a 2010 status review of ESA-listed salmon and steelhead, but offers no details and no specificity. Futhermore, even though NEPA environmental analysis is not limited to effects on ESA-listed species, there is no mention whatsoever of salmon and steelhead ESUs that are *not* listed under the ESA (including the Okanogan River and Lake Wenatchee sockeye salmon ESUs; the middle Columbia River spring-run and upper Columbia River summer/fall-run, and Deschutes River summer/fall-run chinook ESUs; the Southwest Washington steelhead ESU; and the pink salmon ESUs).

O-002-036

The Cumulative Effects Technical Report is no better. After its perfunctory treatment of the effects of the CRC Project itself on ecosystems, the Cumulative Effects Technical Report goes on, in only four paragraphs, to describe the "Effects from Other Actions (Past, Present, Future)" that also play into the cumulative impacts analysis. *Id.* at 3-2. Almost needless to say, those four paragraphs do not describe *any* other projects that affect salmon and steelhead. Rather, the section generally emphasizes that protected fish species' true concern should not be the CRC Project, but instead climate change, hydropower dams, hatcheries, and fisherman. Such cursory "analysis" fails to meet the requirement for high quality scientific analysis as required by 40 C.F.R. §§ 1502.24 and 1500.1(b).

Similarly, discussion of mitigation cannot be substituted for analysis of impacts. *See Te-Moak Tribe*, 608 F.3d at 604-05 (BLM's cumulative impacts analysis in Environmental Assessment ("EA") inadequate). In *Te-Moak Tribe*, the EA concluded that no cumulative effects would occur because all effects from mining exploration would be "avoided or mitigated." *Id.* at 604. Such vague discussion of cumulative impacts is inadequate. *Id.* FHWA and FTA make the same mistake when concluding that impacts are "small" or will be avoided. *See, e.g.*, Cumulative Impacts Technical Report at 3-2. The FEIS goes even further and passes responsibility for the salmon and steelhead to the Basinwide Salmon Recovery Strategy, notably *not* a NEPA document and out of the control of the CRC. *Id.*

The FEIS is actually open about its failure to consider and analyze projects other than the CRC Project. For example, the Cumulative Effects section of the FEIS states that "[w]hile not

O-002-036

explicitly identified and analyzed, ongoing and future federal projects such as the Federal Columbia River Power System and salmon recovery efforts were taken into account during the project development and ESA analysis." Cumulative Effects, 3-455. There is an irony here, however, because the Cumulative Effects section goes on to say that, in the future, agencies will be required to analyze the CRC Project as part of their Biological Assessments and Biological Opinions: "future federal actions must comply with Section 7(a)(2) of the ESA, requiring federal action agencies to ensure that their actions do not result in jeopardy or adverse modification of critical habitat, and Section 9 of the ESA criminally and civilly prohibits any person to take a listed species or critical habitat in the future. *When future federal actions occur, the CRC project would be analyzed as an existing condition, if the CRC project is in construction or has been completed." Id.* (italics added; internal quotation marks omitted). Because NEPA cumulative impacts analysis is much broader than ESA cumulative impacts analysis, this statement is an admission that individual projects, such as the CRC Project, must be "analyzed as [] existing condition[s]" in the cumulative impacts section of an EIS. The irony is that FHWA and FTA have completely failed to undertake any such analysis of their own.

In sum, the FEIS hardly touches on the combined cumulative impacts and briskly brushes off all negative effects. NEPA's "hardlook" requires more from FHWA and FTA. *Native Ecosystems*, 428 F.3d at 1241.

FHWA and FTA have failed to ensure their actions will not violate section 7(a)(2) of the Endangered Species Act.

O-002-036

The ESA represents "an explicit congressional decision to require agencies to afford first priority to the declared national policy of saving endangered species." *Tennessee Valley Authority v. Hill*, 437 U.S. 153, 185 (1978). Section 7 of the statute requires that every federal agency "shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [critical] habitat of such species…." 16 U.S.C. § 1536(a)(2). This provision gives rise to both substantive and procedural obligations. A federal agency proposing to take or authorize an action that may affect listed species or designated critical habitat must, in cases involving Pacific salmonids, consult with NMFS pursuant to the procedures set forth in section 7. This culminates in NMFS issuing a Biological Opinion that provides advice as to whether the proposed agency action is likely to jeopardize listed species or adversely modify critical habitat. Substantively, federal action agencies have a free-standing obligation to ensure that their actions do not run counter to section 7's prohibitions; an agency cannot "abrogate its responsibility to ensure that its actions will not jeopardize a listed species; its decision to rely on a [ ] biological opinion must not have been arbitrary or capricious. *Resources Limited v. Robertson*, 35 F.3d 1300, 1304 (9th Cir. 1993) (internal citations omitted). Both NMFS and action agencies must use "the best scientific and commercial data available" in complying with section 7. 16 U.S.C. § 1536(a)(2).

On February 23, 2004, NMFS issued a Biological Opinion that examined "all basins in Oregon with anadromous fish use…or designated critical habitat." Biological Opinion on EPA's Proposed Approval of Revised Oregon Water Quality Standards at 6. In that Biological Opinion,

O-002-036

NMFS determined the degraded status of listed salmon and steelhead habitat throughout the state "is such that there must be a significant improvements [sic] in the environmental conditions [these fish] experience," and declared that "[a]ny further degradation of these conditions would significantly reduce the likelihood of survival and recovery of these species." *Id.* at 24. NMFS regulations define "jeopardize the continued existence of" as engaging in an action that "reduce[s] appreciably the likelihood of both the survival and recovery of the species in the wild…." 50 C.F.R. § 402.02. Regulations define "destruction or adverse modification" of critical habitat in a similar manner. *See id.*

FWHA, FTA, and NMFS have failed to ensure that the CRC Project is not likely to jeopardize salmon and steelhead ESUs listed as threatened under the Endangered Species Act, 16 U.S.C. §1531 et seq. (ESA), or destroy or adversely modify these species' designated critical habitat. Without any means of accurately determining the current status of these fish and their habitat, keeping track of authorized mortality and injury to these populations, and assessing implementation of measures determined by NMFS as necessary to comply with section 7 of the ESA, allowing additional adverse impacts to these species and their critical habitat is unlawful.

The CRC Project is merely one of a long litany of projects carried out or approved by federal agencies with similar, or in some cases more extensive, adverse impacts on these highly imperiled fish. For example, in 2008 NMFS determined that two of the listed evolutionarily significant units (ESUs) affected by the CRC Project face jeopardy to their continued existence and destruction or adverse modification to their critical habitat unless the U.S. Army Corps of Engineers (Corps) and others implement a long list of measures to improve survival of these fish and restore their habitat. Nevertheless, NMFS lacks any sort of mechanism to keep track of accumulated adverse impacts to listed salmonids and their habitat, including death and injury to

O-002-036

these fish expressly authorized by NMFS. NMFS also appears to have no system for assessing whether the measures identified as necessary to avoid jeopardy and adverse modification of the ESUs' critical habitat are actually being implemented or are effective. Thus even the "small" impacts of the CRC Project could, to use a familiar analogy, potentially be the straw that breaks the camel's back for Columbia River Basin salmon and steelhead near extinction.

Section 7 does not prohibit all negative impacts on listed salmon and steelhead or their critical habitat; rather, it only prohibits agency actions that have the effect of jeopardizing an *entire* listed ESU or adversely modifying the conservation value of an *entire* critical habitat designation. *See* Consultation Handbook at 4-36 and 4-39.[169] A Department of Interior Solicitor's opinion, included as an appendix to the Handbook, explained the implications of these broadly focused prohibitions as follows:

> [A] project passing muster under section 7 is in effect allocated the right to consume (and is presumed to utilize) a certain portion of the remaining natural resources of the area. It is this "cushion" of remaining natural resources which is available for allocation to projects until the utilization is such that any future use may be likely to jeopardize a listed species or adversely modify or destroy its critical habitat. At this point, any additional federal activity in the area requiring further consumption of resources would be precluded under section 7.

Cumulative Effects to be Considered Under Section 7 of the Endangered Species Act, August 27, 1981 at 6 (this opinion is SO-3 in Appendix D of the Handbook). This "straw that breaks the camel's back" approach to assessing jeopardy and adverse modification of critical habitat obviously makes it crucial for federal agencies and NMFS to keep careful track of the "cushion" of remaining resources available for allocating to actions that adversely affect ESUs and their critical habitat.

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[169] The Consultation Handbook was jointly published by FWS and NMFS to provide greater detail on the substantive and procedural requirements of section 7; it is available at http://www.fws.gov/endangered/esa-library/index.html#consultations_policy.

O-002-036

Through the section 7 process, NMFS may also authorize federal actions to cause "incidental take" of protected ESUs, which but for such authorization would generally be illegal under section 9's prohibition against take. See 16 U.S.C. § 1538(a)(1)(A). "Incidental" take refers to death or injury to listed species "that result from, but are not the purpose of, an otherwise lawful activity." *Id.* NMFS may issue an "incidental take statement" (ITS) as part of a biological opinion; an ITS authorizes incidental take resulting from an agency action so long the level of take does not otherwise violate section 7(a)(2) and the federal agency implements "reasonable and prudent measures" to minimize incidental take. *See* 16 U.S.C. § 1536(b)(4). Congress intended NMFS to specify numeric estimates of incidental take in an ITS if such an estimate can be "practically obtained," though the Service may employ a "surrogate" for estimating incidental take provided "these conditions are linked to the take of the protected species." *Arizona Cattle Growers Ass'n v. U.S. Fish and Wildlife Service*, 273 F.3d 1229, 1250 (9th Cir. 2001).

Taken together, the provisions of section 7 and its implementing documents require NMFS to determine the current status of a species and its critical habitat – as affected by all previously authorized federal actions, all past and present non-federal activities, and future non-federal actions "reasonably certain" to occur – in assessing whether a proposed federal action is likely to jeopardize listed ESUs or destroy or adversely modify critical habitat. This analysis of the current status of the species also must consider all past "incidental take" authorized by the Service. Only if a proposed action that will have adverse effects on listed ESUs and critical habitat will not tip the species into jeopardy or adversely modify its critical habitat may the action proceed. NMFS, FHWA, and FTA have failed to undertake any of this analysis.

O-002-036

To illustrate what might be a possible potential starting point for NMFS' analysis of past incidental take, please refer to Appendices A, A1, B, B1, and B2 in ESA Exhibits Folder. For a compilation of all biological opinions issued by NMFS since January 1, 2005, in relation to salmon and steelhead ESUs affected by the CRC Project, see the attached folder entitled "Biological Opinions.2005-01-01 to 2011-01-19." Many, if not all, of these biological opinions should have been considered in some detail and in some meaningful way, by NMFS in issuing the Biological Opinion and by FHWA and FTA in the FEIS.

The Biological Opinion issued by NMFS is inadequate and does not ensure compliance with the Endangered Species Act.

Section 7 regulations set forth the procedure for NMFS to assess whether a proposed action is likely to tip an ESU into jeopardy or adversely modify designated critical habitat. NMFS must first evaluate the "current status of the species or critical habitat," 50 C.F.R. §402.14(g)(2), which the Handbook describes as "the effects of all past human and natural activities or events that have led to the current status of the species" or critical habitat. Handbook at 4-19. Next, NMFS must evaluate "the effects of the action and cumulative effects on the listed species or critical habitat." 50 C.F.R. §402.14(g)(3). The regulations define "effects of the action" to include direct and indirect effects of the action that will be added to the "environmental baseline." 50 C.F.R. §402.02. The "environmental baseline" includes "the past and present impacts of all Federal, State, or private actions and other human activities in the action area," *Id.,* which the Handbook characterizes as a "snapshot" of a species' health at a specified point in time. Handbook at 4-22. The "action area" means "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the

O-002-036

action." 50 C.F.R. § 402.02. Finally, "cumulative effects" include the effects of future non-Federal activities reasonably certain to occur in the action area. *See id.*

If NMFS determines that a proposed federal action is likely to cause jeopardy to a listed ESU or adversely modify designated critical habitat, it must suggest "reasonable and prudent alternatives," if any, which would allow the federal agency to accomplish the goal of its proposed action to the degree possible within its authority without running afoul of section 7(a)(2). 16 U.S.C. §1536(b)(3)(A).

NMFS' CRC Project Biological Opinion is inadequate because it has a flawed assessment of the statuses of the salmon and steelhead ESUs and the Incidental Take Statement is unlawful.

The Biological Opinion's evaluation of the statuses of listed salmon and steelhead and their critical habitat is inadequate.

The Biological Opinion does not consider the best available science.

Section 7(a)(2) of the ESA, 16 U.S.C. §1536(a)(2), requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of listed species or destroy or adversely modify these species' designated critical habitat. The section 7 consultation process assists federal agencies in complying with this mandate. In fulfilling both their substantive and procedural mandates under this section, the ESA requires federal agencies to use "the best scientific and commercial data available." *Id.*

Courts interpret this "best science" mandate to require that federal agencies consider all available information relevant to complying with section 7. In *Conner v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1988), the Ninth Circuit emphasized that agencies "cannot ignore available biological information or fail to develop projections of [actions affecting listed species] which may indicate potential conflicts between development and the preservation of protected species."

O-002-036

See also Kandra v. U.S., 145 F. Supp 2d 1192, 1208 (D. Ore. 2001) ("The Ninth Circuit has interpreted this provision to mean an agency cannot ignore available biological information."); *Southwest Center for Biological Diversity v. Babbitt*, 215 F.3d 58, 60 (D.C. Cir. 2000) (the best science requirement "prohibits the Secretary from disregarding available scientific evidence that is in some way better than the evidence he relies on."). The Biological Opinion does not satisfy this "best science" requirement.

The Biological Opinion does not consider the 2010 *Status review update for Pacific salmon and steelhead listed under the ESA*.

On December 10, 2010, NMFS released the *Status review update for Pacific salmon and steelhead listed under the Endangered Species Act*. This document updated the last formal status update, issued in 2005. This document, although available before the Biological Opinion was issued in early 2011, was not considered or cited in the Biological Opinion. As NMFS issued both the status update and the Biological Opinion, it was aware of the development of both documents and surely would have considered the status update to be some of "the best available science." NMFS therefore easily could have included a discussion of the status update in the Biological Opinion. Its failure to do so renders inadequate the Biological Opinion's evaluation of the statuses of listed salmon and steelhead and their critical habitat. *See also* Appendix A and Appendix B.

The Biological Opinion does not consider additive adverse impacts from prior-issued Incidental Take Statements.

When formulating a biological opinion NMFS has an obligation to evaluate both the "current status of the listed species or critical habitat," as well as the "effects of the action." 50 C.F.R. §402.14(g)(2) and (3). The regulations further define the latter to include a "snapshot" of the species' and critical habitat's health in light of all actions that have previously taken place in

O-002-036

the action area. *See supra* at 3-4. The court carefully examined these requirements in *Fund for Animals v. Babbit*, 130 F.Supp 2d 121 (D.D.C. 2001). Pointing to other federal actions also affecting endangered desert pronghorn which the challenged biological opinion did not consider, the court found that the Biological Opinion had improperly looked at the proposed action's impact on pronghorn "in isolation" from other impacts on the species, and held that FWS had acted unlawful by failing to "analyze the effects of the action in conjunction with the effects of other agencies' actions on the pronghorn." *Id.* at 121, 128. The court also determined that FWS had too narrowly defined the "action area" of the project under consideration in order to "avoid taking into account the impacts of other federal activities on the pronghorn." *Id.* at 129.

Finally, the *Fund for Animals* court noted that FWS had failed to keep track of all incidental take of pronghorn. It observed that "FWS has authorized a total level of take greater than the incidental take provided for in any individual BO without analyzing whether that total level jeopardizes the survival of the pronghorn species." *Id.* at 130. Thus FWS' failure to account for additive incidental take from all federal actions was unlawful because "[w]hile the take of one or two pronghorn as a result of a particular activity may not jeopardize the species as a whole, the aggregate take of pronghorn resulting from each federal activity affecting pronghorn may pose such a risk." *Id.*

Like FWS in the pronghorn case, NMFS in the CRC Project Biological Opinion has failed to consider other federal actions' impacts on listed ESUs and critical habitat. NMFS did not consider or analyze the adverse impacts identified in any of its previous Biological Opinions in assessing the "current status" in 2011 of listed ESUs and critical habitat affected by the CRC Project. Although NMFS does cite a few Biological Opinions (notably the FCRPS and

O-002-036

Willamette Project Biological Opinions), it does not offer any analysis or detail of the impacts of those projects.

Even more obvious is NMFS' complete failure to keep track of total incidental take of listed salmon and steelhead ESUs. Almost all of the hundreds of biological opinions NMFS has issued for projects with adverse impacts on listed Columbia River Basin salmon and steelhead ESUs have included ITSs authorizing some level of incidental take of these fish. However, just as the *Fund for Animals* court pointed out with respect to desert pronghorn and the GAO report documented for most other species overseen by FWS, NMFS lacks any system for keeping a tally over time of incidental take of salmon and steelhead it authorizes. Yet the agency continues again and again to issue additional authorizations to incidentally kill or injure species – as it did in the CRC Project Biological Opinion. These allowances permit death and injury to species which NMFS expressly acknowledges are near extinction. Information about take previously authorized by NMFS is obviously available to the agency by simply examining its prior incidental take statements, yet NMFS did not consider this information prior to issuing the incidental take statement as part of its CRC Project Biological Opinion.

NMFS must make decisions as to whether a proposed federal action is likely to jeopardize the continued existence of listed species or destroy or adversely modify their critical habitat by assessing a proposed action's impacts on the *entire* species and *entire* critical habitat designations. This means that as long as the species as a whole remains viable, or a species' overall critical habitat can still fulfill its conservation function, adverse effects on listed species and their critical habitat, no matter how large, do not run afoul of section 7(a)(2). Conversely, under this scheme even a small localized impact to the species and/or critical habitat can tip a species into jeopardy, or critical habitat into adverse modification, if the species or its habitat as a

O-002-036

whole has declined to the point at which no "resource cushion" of allowable impact remains. This system of assessing jeopardy and adverse modification clearly puts a premium on accurate and up-to-date information on the status of affected ESUs and their critical habitat, including the total number of fish authorized to be killed or injured. Instead, NMFS simply repeats essentially the same version of the "current status" of these species and their habitat each time it formulates a biological opinion. Given that the current status of the ESUs and their habitat virtually do not change – even after NMFS repeatedly authorizes additional adverse impacts and additional take of individuals – it is obviously not difficult for NMFS to continue to allow more such impacts. In other words, it's easy to feel comfortable loading more straws onto the camel when one never counts the straws.

Unfortunately, FWS and NMFS have had difficulties keeping track of the status of listed species in attempting to fulfill their role in the section 7 process. A 2009 report by the Government Accountability Office found that FWS was unable to account for required monitoring reports for the majority of biological opinions it issued, meaning that FWS was unable to accurately track accumulated impacts on listed species. *See* GAO Report 09-550, entitled "The U.S. Fish and Wildlife Service Has Incomplete Information about Effects on Listed Species from Section 7 Consultations" (available at http://www.gao.gov/search?q=09-550). The GAO also found that FWS "lacks a systematic method of tracking cumulative take for most species," and concluded that "[w]without cumulative take information, the Service may not be able to effectively evaluate the collective impacts of federally authorized actions over time, across multiple offices, and across species' ranges. Although one action may not unduly harm a listed species, cumulative effects over time and across landscapes could lead to a species' demise without the Service's knowledge or ability to respond." GAO Report at 16, 26. As the facts of

O-002-036 this case demonstrate, NMFS' procedures for fulfilling its section 7 responsibilities suffer from exactly the same deficiencies outlined in the GAO report.

Finally, even when incidental take statements issued by NMFS *have* provided actual numeric estimates of the number of salmon and steelhead likely to be killed or injured by a proposed project, NMFS did not even consider this take in the CRC Project Biological Opinion and ITS prior to allowing additional incidental take of affected ESUs. This demonstrates NMFS' complete lack of effort to track total take of listed ESUs over time, no matter how it is quantified or estimated. However, there obviously must be some limit on the additive amount of take over time that NMFS can authorize without resulting in jeopardy – as the GAO recognized in its report on FWS' failure to track overall take authorized by the agency. *See* supra at 3. Failing to consider even numerically estimated take in its past ITSs prior to authorizing additional take renders the CRC Project Biological Opinion inadequate.

Tracking Implementation of the Willamette Project RPA.

The Willamette River and the habitat it provides for threatened salmon and steelhead are fundamentally degraded and altered from historic conditions. Since the 1870s, development began to strip away the riparian forests surrounding the river, resulting in large functional losses to the river's complexity and productivity and reducing the amount of habitat crucial for salmon and steelhead. Once highly braided and complex, the Willamette River system was also dramatically simplified through activities such as channelization and the placement of bank stabilizing "revetments." The river banks are now lined with more than 96 miles of revetments, about half of which the Corps constructed. These activities and the resulting impacts reduced available salmonid rearing habitat by as much as 75 %. Moreover, thirty-seven dams in the basin now block salmonid access to more than 435 miles of important stream and river spawning

O-002-036

habitat in the Willamette Basin, and altering temperature regimes in the Willamette River and its tributaries. Finally, while human civilization has advanced in the region, water quality, salmon and steelhead and their habitat have suffered further due to agriculture, urbanization, mining, and timber harvest; adverse impacts from river dredging and associated industrial activities resulted in additional additive harm

As a result of these impacts, salmon and steelhead in the Willamette River have declined to the point that they are facing extinction. In 1999, NMFS listed the Upper Willamette River (UWR) chinook[170] and steelhead[171] ESUs as threatened under the ESA. In 2005, NMFS designated extensive portions of the Willamette Basin as critical habitat for UWR chinook and steelhead. These ESUs are adversely affected by the CRC Project and are addressed in the CRC Project Biological Opinion.

On July 11, 2008, NMFS issued a Biological Opinion for the Army Corps of Engineers' ("the Corps") operation of the that agency's Willamette Project dam system; this Biological Opinion determined that the agency's proposed operation of the dams was likely to jeopardize the continued existence of UWR chinook and UWR steelhead, as well as destroy or adversely modify these ESUs' critical habitat. The action area described in NMFS' 2008 Willamette Project Biological Opinion was expansive, including "[a]ll river reaches, riparian zones, and floodplain areas located downstream of the 13 Willamette Project dams, including the mainstem Willamette River…". As required by the ESA, NMFS specified a reasonable and prudent alternative ("the RPA") to the Corps' proposed operations that would allow the Corps to operate its dams in a manner that avoids jeopardy and destruction or adverse modification of critical habitat. The RPA requires the Corps, in cooperation with other federal agencies and the State of

[170] *Id.*
[171] 64 Fed. Reg. 14,517 (Mar. 25, 1999).

O-002-036

Oregon, to implement a comprehensive slate of measures to improve survival of Willamette salmon and steelhead and to improve their habitat, including steps to improve hatchery practices, increase water flows and improve water quality, restore habitat throughout the Willamette Basin, and even allow for fish passage over several of the Corps' dams in the Willamette Basin. These measures will take many years and millions of dollars to fully implement. The Biological Opinion calls for a timeline for these measures, as well as creation of a detailed organizational structure to oversee implementation of the RPA; the Corps and NMFS are part of each element of this structure.

Between the issuance of the Willamette Project Biological Opinion on July 11, 2008, and the issuance of the CRC Project Biological Opinion on January 19, 2011, NMFS issued 69 additional Biological Opinions for projects affecting UWR chinook salmon, and 60 additional Biological Opinions for projects affecting UWR steelhead, almost all finding additional adverse impacts to those ESUs and their critical habitat, and all concluding that the proposed actions would not result in jeopardy or destruction or adverse modification of critical habitat. In each of these Biological Opinions, however, NMFS has not evaluated whether the habitat restoration requirements or any other substantive elements of the 2008 Willamette Project Biological Opinion's RPA have been implemented or have been effective in improving survival of UWR chinook and UWR steelhead.

Additionally, NMFS has continued to authorize adverse impacts and incidental take even though NMFS' 2008 BiOp for the Corps' Willamette Project found jeopardy and adverse modification for UWR chinook and steelhead (the "action area" for this action extends from and includes the mainstem Willamette and the Columbia River from the confluence of the Willamette and Columbia rivers). NMFS' Executive summary of the Willamette Project

O-002-036

Biological Opinion points out that the RPA set forth in the Biological Opinion (and adopted by the Corps) includes "many measures… that the Action Agencies will carry out in the shorter term that will ensure that the UWR chinook will not go extinct in the near future." The Corps also issued its own explanation of the Willamette Project Biological Opinion and RPA, which asserts that these documents "require monitoring and reporting to ensure compliance with [RPA] requirements."

Quite clearly, it would be problematic – if not impossible – for NMFS to approve additional adverse impacts on listed ESUs and their designated critical habitat if those species were already facing jeopardy and destruction and adverse modification of their critical habitat due to prior federal agency actions. *See* Solicitor's Opinion, supra at 3 (once a species reaches the jeopardy threshold, "any additional federal activity in the area requiring further consumption of resources would be precluded under section 7"). However, there is no indication in the CRC Project Biological Opinion that NMFS considered any information related to whether the Corps and cooperating entities are implementing the Willamette Project Biological Opinion's RPA, including short-term measures identified by NMFS as needed to avoid extinction of UWR chinook, and whether those measure have proven to be effective. This information is highly relevant to assessing whether the Corps, in continuing to operate the Willamette Project, is avoiding jeopardy to UWR chinook and steelhead and adverse modification to their critical habitat throughout the watershed. Additionally, this information is (or at least should be) readily available to NMFS given that the agency is part of every work group and decision-making body for implementing the RPA.

NMFS' failure to consider in the CRC Project Biological Opinion whether the UWR ESUs remain in a jeopardy and adverse modification situation necessarily results in one of two

O-002-036

scenarios. First, NMFS could have simply failed to consider available information relevant to this question, including the monitoring information required by NMFS in its Willamette Project Biological Opinion and RPA. In that case, NMFS has clearly failed to consider the best science available in completing its CRC Project Biological Opinion. On the other hand, NMFS and the Corps could be neglecting to strictly monitor implementation and effectiveness of the Willamette Project Biological Opinion's RPA. In that case, FHWA and FTA would be failing to comply with their section 7 duties by proposing additional impacts to the UWR ESUs from the CRC Project without knowing whether the Corps has been taking the steps already identified as necessary to avoid jeopardy and adverse modification to these ESUs. Additionally, NMFS would lack sufficient data to render a biological opinion on the CRC Project. *See* 50 C.F.R. §402.14(f) (allowing NMFS to request additional data it concludes would "provide a better information base from which to formulate a biological opinion").

In sum, NMFS has, or should have, ready access to information not only relevant, but vital to its assessment as to whether the proposed CRC Project is likely to jeopardize the affected salmon and steelhead ESUs and their critical habitat. Information in prior Biological Opinions and incidental take statements issued by NMFS, as well as monitoring data relevant to measures set forth in the Willamette Project RPA, constitutes the "best science" regarding the status of ESUs and their critical habitat affected by the CRC Project. This information was clearly available to NMFS, yet there is no indication that the agency considered it in formulating its CRC Project Biological Opinion. NMFS thus violated its duty under section 7 to use the best available science.

The Biological Opinion's Incidental Take Statement is unlawful.

O-002-036

The CRC Project Biological Opinion's incidental take statement (ITS) allows for incidental take of fish throughout the duration of the project without a numeric estimate of, or limitation on, the actual number of juvenile fish likely to be killed or injured. In addition to NMFS' failure to track the impacts of additive incidental take the agency has authorized over time, the ITS itself is unlawful. In fact, this ITS provides a good indication as to why NMFS has no method to keep track of overall incidental take.

In *Ariz. Cattle Growers' Ass'n v. U.S. Fish & Wildlife*, 273 F.3d 1229, 1250–51 (9th Cir. 2001), the Ninth Circuit discussed the Services' authority to authorize incidental take. Citing NMFS' and FWS' Consultation Handbook, the court noted that if the Service uses a surrogate for estimating the extent of incidental take rather than providing a numeric limit, the agency "must establish a link between the activity and the taking of species." *Id*. at 1250. In *ONRC v. Allen*, 476 F.3d 1031, 1040 (9th Cir. 2007), the court noted that ITSs "also provide for ongoing monitoring of incidental take by the action agency and the FWS." Part of this monitoring function allows the action agency to know when it has incidentally killed or injured too many members of the listed species, thus triggering its duty to reinitiate formal consultation under section 7. *See id*. at 1039 (finding an ITS illegal when its "permissible level of take is coextensive with the project's own scope"). The court emphasized that the chosen surrogate in an ITS "must be able to perform the functions of a numerical limitation." *Id*. at 1038

The CRC Project ITS says "the extent of take is defined as the area where the CRC action will: (1) Reduce water quality during construction and through stormwater discharge for the life of the CRC; (2) produce harmful underwater noise during construction; and (3) convert benthic foraging habitat to less productive aquatic habitat types during construction and for the life of the CRC." While all of these surrogate indicators are inadequate, the "benthic foraging habitat"

O-002-036

surrogate is the most obviously deficient. That surrogate is characterized as follows: "[t]he extent of take due to loss of benthic foraging habitat is described by the area permanently displaced by bridge columns, *i.e.*, 0.17 acre. Thus, the best available indicator for the extent of this loss is 0.17 acre." However, this level of incidental take is "coextensive with the project's own scope" and both "define[ ] and limit[ ] the level of take using the parameters of the project," which the court found unlawful in *ONRC v. Allen*, 476 F.3d at 1039.

Even more importantly, by failing to link these surrogate measures of incidental take to actual death or injury to members of listed ESUs, NMFS has eliminated the monitoring value of the ITS. Although turbidity and noise levels can be measured, NMFS has articulated no means that these measurements relate to how many fish will be taken. The ITS thus does not provide a meaningful measure of incidental take by the proposed CRC Project. Accordingly, it is impossible for NMFS to keep track of the total amount of take that it has authorized over time, as incrementally increased by the CRC Project ITS. Lacking any ability to track total incidental take authorized by NMFS, the agency has no way to assess whether the additional increment of incidental take it authorized in the CRC Project Biological Opinion will jeopardize the continued existence of the ESUs affected by the project, as it must under section 7. *See* 16 U.S.C. §1536(b)(4)(A). NMFS' use of surrogates for defining allowable incidental take without linking those surrogates in a meaningful way to actual take is much like tracking one's bank account withdrawals by taking notes such as "today I took some money out of my account," and "yesterday I withdrew a bit from my account." Such notations are just as meaningless for tracking total withdrawals of money from a bank account as "[no] more than a 10% cumulative increase in natural stream turbidity 300 feet from an upland or in-water CRC construction activity" is for keeping track of the number of total salmon and steelhead injured or killed.

The FEIS's ESA analysis is inferior to the Biological Opinion's ESA analysis, and therefore does not ensure compliance with the ESA.

O-002-036

FHWA and FTA have free-standing obligations to ensure that their actions are not likely to jeopardize affected ESUs or destroy or adversely modify their critical habitat. *Resources Limited v. Robertson*, 35 F.3d 1300, 1304 (9th Cir. 1993) (internal citations omitted). Despite this obligation, FHWA and FTA have completely failed to independently consider information described in the above subsections, despite the fact that this information is also readily available to these agencies. The FEIS simply parrots the conclusions of NMFS' Biological Opinion with no independent analysis. Accordingly, the action agencies' conclusion that they have fulfilled their duty under section 7(a)(2) to ensure against jeopardy and destruction or adverse modification of critical habitat is arbitrary.

The Biological Opinion and FEIS do not adequately address in-water work window (IWWW) issues.

The normal in-water work window (IWWW) for work in the Columbia River is November 1 through February 28. Oregon at 2, ESA Exhibits Folder. However, the CRC Project proposal includes in-water work from at least September 15 to April 15, and possibly even year round.

The in-water work window guidelines are based on ODFW district fish biologists' recommendations, with primary consideration given to important fish species including anadromous and other game fish and threatened, endangered, or sensitive species. *Id.* at 1. While ODFW has not issued a variance to the normal in-water work window, NMFS, in its Biological Opinion, expresses its approval of an expanded in-water work window for the CRC Project. CRC Biological Opinion, at 80. Incredibly NMFS routinely denies such variances for project's with

O-002-036

much smaller potential impacts on salmon. *See* Lake Oswego, ESA Exhibits Folder.

Neither the Biological Opinion nor the FEIS address the state variance process for in-water work, and do not specifically or adequately address the increased impacts to wildlife from work during this time of special sensitivity to salmonids. This is a very significant and material omission from both the BiOp and FEIS. Indeed, the DEIS did not disclose that there would or could be a variance from the standard in-ware work window. Instead the DEIS actually suggested that the project would comply with that restriction. See DEIS Ecosystems Tech. Report at 1-10. This abrupt change between the DEIS and FEIS and lack of analysis regarding that change requires a SDEIS.

The Federal Agencies Have Failed to Consider Their Conservation Obligations Under ESA Section 7(a)(1)

The citizens of the Pacific Northwest understand that simply avoiding "jeopardy"-- the immediate extinction of our native salmon and steelhead -- is not a long-term strategy for protecting these important species. The ESA recognizes that reality as well, and, as is noted above, federal agencies have an obligation under 16 U.S.C.§ 1536(a)(1) to also consider and carry out programs for the conservation of listed species. However, apparently the CRC staff and the Federal agencies are not aware of this obligation or do not consider it to be important, because it is completely ignored in the FEIS. The CRC staff and those federal agencies were in fact made aware of alternatives, including alternative bridge designs, that would likely have reduced in-water impacts on threatened salmonids and possibly improved their existing habitat. Those federal agencies were required to at least evaluate such options and include that evaluation in the FEIS. Instead those options were dismissed because of concerns about Cessnas at Pearson Field and the "project schedule." The ESA and NEPA do not allow the Federal Agencies to summarily prefer Cessnas over salmon or to hide behind the project schedule when they have

O-002-036 already taken more than three years to finalize the FEIS.

INDIRECT IMPACTS—INDUCED GROWTH, TRAFFIC PROJECTIONS AND FINANCIAL ANALYSIS

Induced Growth: Metroscope 2010

O-002-037 The most significant addition to the induced growth analysis in the FEIS is the 2010 Metroscope model. Unlike project traffic models, Metroscope does not assume steady growth in Clark County regardless of whether the CRC is built.[172] Rather, it uses commute times and other factors to determine whether additional highway capacity will induce growth in Clark County.[173] Unfortunately, the model relies on problematic assumptions that lead to counterintuitive conclusions. First, the model assumes that Metro's Urban Growth Boundary and Clark County's Urban Growth Area will remain fixed until 2030.[174] For Metro, this is not an appropriate assumption given that the boundary was just expanded by 1,985 acres on October 20, 2011. Moreover, as a 2004 study published in the land use journal Urban Studies indicates, Portland's relatively tighter UGB has historically had a spillover effect into Clark County, where land use regulations have been less rigid, resulting in increased sprawl in that area.[175] Therefore, the assumption of fixed growth boundaries fails to account for historical trends and, as the Metroscope study admits,

> If Metro continues to follow a policy of maintaining a tight Urban Growth Boundary (UGB) and is not successful at accommodating growth through increased levels of

[172] CRC Responses to PEAC DEIS Comments, 54
[173] "Columbia River Crossing MetroScope Results Documentation" (2010), 4. Available at http://www.columbiarivercrossing.org/FileLibrary/TechnicalReports/CRC_Metroscope%20Results_120910.pdf in Indirect Effects Folder.
[174] *Id* at 5.
[175] Myung-Jin Jun, "The Effects of Portland's Urban Growth Boundary on Urban Development Patterns and Commuting." *Urban Studies* (June 2004), 1333-1348.

O-002-037

PEAC's comment regarding a fixed set of land use assumptions is a misinterpretation of the paragraph at the bottom of page 5. Specifically, the statement in the report: "This analysis assumed a fixed set of land use assumptions in both Metro and Clark County reflecting currently adopted plans" does not equate to assuming a fixed UGB through 2030. In fact, part of Metro's adopted plans acknowledge the state requirement to review the UGB every five years and take action to ensure there is a 20-year land supply to accommodate projected demand. As such, the Metroscope model for this analysis assumed a schedule of UGB and UGA expansions to 2030. Further, contrary to the comment, the analysis does account for historical trends in that the UGB assumptions in Oregon are conservative and rely upon more aggressive redevelopment and infill policies as contrasted by a somewhat more expansive UGA assumption in Clark County with less agressive assumptions on redevelopment and infill. Oregon assumptions are based upon Metro plans and policies while Clark County assumptions are based upon Clark County plans and policies.

What the paragraph in the report is attempting to indicate is that other factors besides building the CRC project have an impact on the prospect for induced growth and that this report does not attempt to evaluate those factors. For example, the analysis did not evaluate a conservative set of land use assumptions accompanying the No-Build Alternative in comparison to an aggressive set of land use assumptions (with considerably more UGA expansion in Clark County) in the Build alternative. The land use inputs of UGB/UGA area, vacant land, zoning, etc., are identical between alternatives, including the same UGB/UGA expansion schedule.

PEAC also misinterpreted the narrative in the report on page 14 regarding the 7 residential sites in Clark County and 50 employment sites in Oregon. These were selected to be representative of typical

O-002-037

> redevelopment and infill there would be greater pressure on Clark County and the cities of Clark County to expand their Urban Growth Area (UGA), and there could be significantly more induced household growth in Clark County than reflected in this analysis.[176]

In a 2001 paper written by two Metro analysts who helped develop Metroscope, the dangers of assuming fixed growth boundaries for studies of time-saving highway projects are discussed:

> When financially unconstrained systems are run with the same fixed land use, we generate the mirror image of the simulation of a congested system. Despite decreasing travel times and increasing speeds, commuters travel no further than they did on the congested system; per capita VMT and travel distances remain roughly the same as before. Again implicit transportation price changes up or down appear to have no effect on commuter behavior. In this instance, commuters pocket large amounts of "travel cost savings" though nothing in the model specifies what happens to these consumer surpluses.[177]

Due to Clark County's historical failure to maintain tight growth boundaries and the Metroscope creators' admission that fixed land use assumptions lead to inaccurate results, Metroscope's 2010 model is fundamentally flawed.

The model makes a second questionable assumption when establishing employment and residential locations for purposes of determining likely commute routes and times. The model assumes that all commutes occur between 7 residential locations in Clark County and 50 employment locations in Oregon, without providing adequate justification for the selections.[178] The locations are critical to model accuracy because they dictate the lengths and routes of trips that the model uses to compare impacts of increased capacity and tolling. If a given commute involves more time on I-5, it will experience a greater time savings and therefore an increased

[176] "Columbia River Crossing MetroScope Results Documentation." 5.
[177] Conder, Sonny. "Alternative Futures for Transportation and Land Use – Integrated Models Contrasted with "Trend-Delphi" Methods: The Portland Metro Results" (2001), 7. Available at http://library.oregonmetro.gov/files/altfuturesfortransandlanduse.pdf
[178] "Columbia River Crossing MetroScope Results Documentation." 14.

commutes across the I-5 Bridge to communicate the results of the analysis. The full model runs underlying the report are based upon a travel demand model for the four county area (Clackamas, Clark, Multnomah, and Washington) with trip movement between 1,998 different analysis zones, not just the 7and 50 representative zones described in the report. This accounts for all of the possible trip movements from every analysis zone in the region to every other analysis zone. Allocation of household and employment growth is through a land use allocation model for the five plus county area (Clackamas, Clark, Multnomah, Washington, Columbia and parts of Yamhill and Marion) to a set of zones that aggregates the travel zones to 425 residential zones (census tracts) and 72 employment zones.

PEAC's comment referencing the travel time savings is comparing a single specific travel time from one point to one point against the aggregate travel time difference perceived by all PM peak motorists from all origins to all destinations via either I-5 or I-205. It is the relative accessibility of different parts of the region that impacts growth allocation including the change in access to Clark County from Oregon regardless of which bridge they choose to use. In aggregate, the report documents that most of the accessibility to Clark County is already provided today with the existing I-5 and I-205 bridges.

O-002-037

likelihood of sprawl, whereas a commute that spends less time on I-5 will experience minimal benefit and therefore a lower likelihood of sprawl. Despite their importance to the model's success, the locations' selection was apparently based on merely what the authors considered designated work centers or typical residential locations:

> The Oregon employment locations are transportation analysis zones (TAZ) selected from areas in Oregon designated as Regional Centers, Town Centers, Central City, or regionally significant industrial areas. Clark County residential locations were identified to include the weighted residential centroid of the county and typical residential locations throughout the county.[179]

The lack of detailed justification for the selection of such important model inputs is disconcerting, particularly given that many locations are noticeably distant from the I-5 corridor (Figure 3.1-1), which would tend to underestimate induced growth.

Given that both assumptions mentioned would tend to downplay induced growth potential, the model's pro-CRC outcome is unsurprising. However, the model's bias reveals itself in Figure 3.3-1, which compares the number and duration of northbound commutes between 4 and 6 p.m. for the no-build alternative and the build-with-toll alternative.[180] The latter includes a "toll impedance" factor which adds time to the perceived commute duration in order to reflect the discouraging effect tolls have on driving. According to the model, the average commute length for the no-build alternative is 35.9 minutes and that for the build-with-toll alternative is 34.1 minutes (including toll impedance).[181] The model predicts that despite expanding Columbia River Bridge bottleneck from 6 to 12 lanes, the average commuter during afternoon rush hour would only perceive a time savings of 1.8 minutes.[182] While this conclusion suggests minimal

[179] "Columbia River Crossing MetroScope Results Documentation." 14.
[180] "Columbia River Crossing MetroScope Results Documentation." 26.
[181] "Columbia River Crossing MetroScope Results Documentation." 26.
[182] "Columbia River Crossing MetroScope Results Documentation." 26.

O-002-037

induced growth, it is wholly inconsistent with Figure 7-16 of the FEIS Traffic Technical Report, which indicates a 20 minute savings for the 2 hour P.M. peak trip from I-84 to 179th Street.[183] Applying the 6 minute toll penalty used in the FEIS Indirect Effects Technical Report, a 14 minute perceived time savings is realized.[184] Obviously, not all commutes will obtain the full 14 minute perceived benefit due to varying route selection. However, it is difficult to imagine the average commuter only realizes 1.8 minutes of the benefit, which indicates inherent flaws in the underlying assumptions of the Metroscope model. The FEIS contains large time savings (14 minutes) to justify the project, but minimal time benefits (1.8 minutes) to downplay the likelihood of induced sprawl.

Literature review

O-002-038

Another component of the FEIS induced growth analysis is a literature review of induced growth studies.[185] As in the DEIS, the literature review fails to explain why certain studies were chosen over others and why they apply to the particular facts of the CRC. In the FEIS, the review is distilled into 6 factors that influence induced growth, and each is addressed in Exhibit 2-1 in the FEIS Indirect Effects Technical Report.[186] Nearly every factor oversimplifies the facts of the CRC at the expense of complete evaluation of the project's induced growth impact.

The first two factors pertain to whether the CRC creates new access to underserved areas or areas on the urban edge.[187] The analysis finds that the CRC would not create new access because I-5 has been an interstate corridor since 1958 and the urban edge would not be more accessible because the project is 7 miles from the north edge of the Urban Growth Area. While the project

[183] FEIS Traffic Technical Report, Exhibit 7-16.
[184] FEIS Indirect Effects Technical Report, 2-7.
[185] FEIS Indirect Effects Technical Report, 2-2.
[186] FEIS Indirect Effects Technical Report, 2-2.
[187] FEIS Indirect Effects Technical Report, Exhibit 2-1.

O-002-038

The indirect effects analysis for CRC included an assessment of the project's effects on land use, a survey of academic literature and comparison to its relevant findings, a comparison and analysis of growth management regulations in the region, transportation demand modeling and traffic operations analysis, and advanced transportation-land use modeling. While it is generally acknowledged that transportation facilities can indirectly affect land use patterns, and some types of highway capacity improvements can promote "sprawl", it is also clear from the academic research that the particular characteristics of each project, and the context of each project, are critical to its likely indirect effects. This is summarized in the FEIS (pages 3-116 through 3-119) and further discussed in the Indirect Effects Technical Report. The analysis has been reviewed by an independent panel of experts who unanimously determined the methodology to be valid and reasonable. Additionally, the analysis has been validated by the results of the 2010 Metroscope modeling.

Regarding specific comments raised:

- the project would not provide new access to areas previously unserved or greatly underseverd by highways;
- the project would not provide new access to land on the urban edge;
- the analysis acknowledges that the project would improve travel times compared to No-Build;
- the LPA would reduce fuel costs and auto wear and tear for some drivers, but not enough to offset the increased cost from the toll;
- the analysis acknowledges that there are some real estate markets that support low density development; and,
- the analysis notes that local and regional land use regulations are not ineffective at managing growth (while the Portland area of the region has a longer history with growth management and more stringent controls on development outside the growth boundaries,

O-002-038

may not create *new* access, it does, according to traffic models, significantly increase access to areas all along the I-5 corridor, including access to the edge of the growth boundary. The failure of the analysis to acknowledge and discuss this important fact indicates an incomplete analysis. The next factor is whether the project would substantially improve travel times.[188] Rather than simply answer the straightforward quantitative question, the analysis immediately launches into an explanation of why an improvement in travel time would likely be minimized by an added toll. The analysis is analogous to an interviewee who asks himself a question then provides a non-responsive and evasive answer. The answer is simple: transportation models show that a round trip from 179th to I-84 during peak periods would be reduced from 90 minutes to 62 minutes.[189] That this fact was so abruptly downplayed indicates lack of objectivity persistent throughout the induced growth analysis.

Next, the analysis asks whether the project reduces auto travel costs. As described prematurely under the previous factor, the toll increases costs, making the 28 minute round trip savings feel like a 16 minute perceived savings, which the analysis claims, without further justification, "is not expected to have a significant impact on induced demand." However, while the analysis stresses the dampening effects of tolling, it completely fails to consider cost savings resulting from a shorter, less congested commute, which include improved fuel economy and less vehicle wear and tear. Absent is the question whether some of the 6 minute toll impedance effect would be counteracted by these savings. Ignoring the cost savings associated with a less congested commute is consistent with a theme prevalent throughout the analysis of downplaying factors likely to induce growth.

[188] FEIS Indirect Effects Technical Report, Exhibit 2-1.
[189] FEIS Traffic Technical Report, Exhibit 7-16.

Washington's growth management regulations and practices are clearly among the more effective nationally, which is the context of the academic literature from which these key variables associated with induced sprawl are drawn).

In addition, the academic literature regarding the indirect effects of highway construction on land is just half of the body of literature reviewed. The FEIS also draws from the findings of academic literature regarding the indirect effects of high capacity transit projects on land use.

See also the response to letter P-047-007 (regarding indirect effects analysis) and P-047-010 (regarding academic literature on indirect effects).

O-002-038

The fifth factor considers the impact of local land use regulations and concludes that due to the region's commitment to effective growth management the risk of sprawl is low.[190] As discussed, this assertion flies in the face of Clark County's history of expanding growth areas in response to Metro's relatively firm boundaries.[191]

The final factor looks at whether there are real estate markets supporting low density developments and concludes that while some low density areas exist, they are quite far from the project area and therefore unlikely to contribute to induced growth.[192]

The following comments, on pages 147- 175 regarding financing, traffic modeling and projections, and induced growth are adopted and incorporated from separate comments that Joe Cortright will also be submitting. The documents cited in this section are located in the Indirect Impacts Folder.

CRC project financing is highly uncertain, making it impossible to know what will actually be built and therefore what will be the actual environmental, social and land use impacts.

O-002-039

In order to assess the impacts of the project, you have to know what the project is. It is clear from the record that the scale of the project will be adjusted to fit available financing. But as yet, the project's financing is simply conjectural: none of the sources of funding (federal highway earmarks, FTA transit funding, Oregon and Washington gas tax increases, tolls, and a CTRAN sales tax) have been committed to the project. The Governors have directed that the project be phased, and the CRC has indicated that it is planning to break the project into phases, but as yet, no meaningful action has been taken.

[190] FEIS Traffic Technical Report, Exhibit 7-16.
[191] "The Effects of Portland's Urban Growth Boundary on Urban Development Patterns and Commuting."
[192] FEIS Traffic Technical Report, Exhibit 7-16.

O-002-039

As these comments are copied from Mr. Joe Cortright's submitted comment letter, please see the responses to his letter (P-047).

O-002-039

It is apparent from the staff report that the financial plan for the CRC is completely unresolved at this point. We have no idea what kind of project will actually be built, so we have no way of accurately assessing its impacts.

The CRC depends on a complex, multi-part financing plan. None of the parts of the plan have yet been approved by any of the bodies that must approve such funding. There are four key elements to this financing plan: toll bonds, Oregon and Washington appropriations, federal New Starts funding, and federal highway funding.

The CRC financing plan rests on seven key assumptions about decisions that will be made and amounts that will be provided for project funding:

1. Washington legislative approval of facility tolling.
2. Washington legislative approval of funding for the state share of the project.
3. Oregon legislative approval of funding for the state share of the project.
4. Earmarking or Federal Highway Administration approval of funding for the highway portion of the project.
5. Federal Transit Administration approval of New Starts Funding
6. Oregon and Washington Treasurers' approvals for the authorization of toll-backed revenue bonds
7. Voter approval in the CTRAN district or a portion thereof of operating funds for light rail.

In order to construct the project as currently described by the Project Sponsors Council, all of these financial approvals must be made, and made at the full amount budgeted. If any of these sources of funds or approvals is not made, or if funding is provided at less than the budgeted amount or if funding or approval is delayed, there is no assurance that all of the component parts of the project will be constructed.

O-002-039

There are major risks that one or several of these assumptions are incorrect and that expected sources of funding will not materialize, and additional risks that they will not materialize in the amounts budgeted or on the schedule currently planned.

In addition, it now seems certain that the project will need to be broken into a series of separate phases. The timing and the ultimate scope of the Columbia River Crossing project will depend upon the amount of funds received for project construction. There is no assurance at this time that any given component of the project will be completed.

At the present time, it is highly likely that funding will not be available to construct the entire project as described. Acknowledging this fact, on July 20 of this year, Governor John Kitzhaber directed CRC to develop a "sequencing" plan for the project (Kitzhaber 2011):

> The Treasurer also identified potential replacement revenue strategies, which I appreciate and am willing to explore. But I believe that if we are going to get the CRC done, it is time to start planning for a project that adapts to the available resources and fits into today's economic reality. To that end, I am going to ask the Oregon Department of Transportation and the CRC to prepare a sequencing plan that accommodates anticipated cash flow.
> (Kitzhaber 2011)

The need to sequence or phase the project to fit available funding is likely to result in major changes to the project's scope, timing and ultimate impacts. More than a year ago, the Independent Review Panel appointed by then-Governor Kulongoski and Governor Gregoire concluded that the project would need to be broken into phases because of the low likelihood of all of the projected funding materializing. The IRP recommended the project be broken into

O-002-039

three phases each of 1 to $1.5 billion (Independent Review Panel 2010, page 186). The IRP is particularly significant because the Directors of the Oregon and Washington Department's of Transportation both said that they accepted the report and agreed to implement its findings (Garrett and Hammond 2010). The IRP also recommended that phases be constructed to be independent and self-standing, so that the project would be functional regardless of whether funding for subsequent phases was ever realized.

The IRP warned that there may not enough money to complete the whole project and that it ought to be designed so that it could be built in phases, and that if subsequent funding did not become available—which it specifically identified as a possibility—that the project would be functional.

> There is a possibility that despite best efforts to assemble funding, the Project Sponsors may encounter a significant shortfall in funding to complete all of CRC as currently envisioned. There is also a possibility that a number of current uncertainties in design and schedule will adversely affect the total cost of the project. Projects of this size and scope are often planned and developed assuming a phased construction effort. Phasing (as opposed to staging) refers to the completion of some major portion of a total project, with such completion having meaningful value, yet deferring subsequent construction till later, often uncertain, dates when additional funding can be obtained.
> Independent Review Panel 2010, Page 185

Because the project will be phased or sequenced, and that phasing plan has not even been presented, much less adopted, no one has any assurance as to what portion of the project will actually be built. Because the project consists of a diverse array of components, some of which increase traffic (new bridge lanes, new intersection capacity), and others which reduce or divert it (light rail transit, tolling), not knowing which phases will actually be built means that the FEIS fails to disclose what will be the net environmental, economic and social impacts of this project.

CRC traffic and toll revenue forecasts are inaccurate, meaning traffic and traffic related impacts are not accurately assessed.

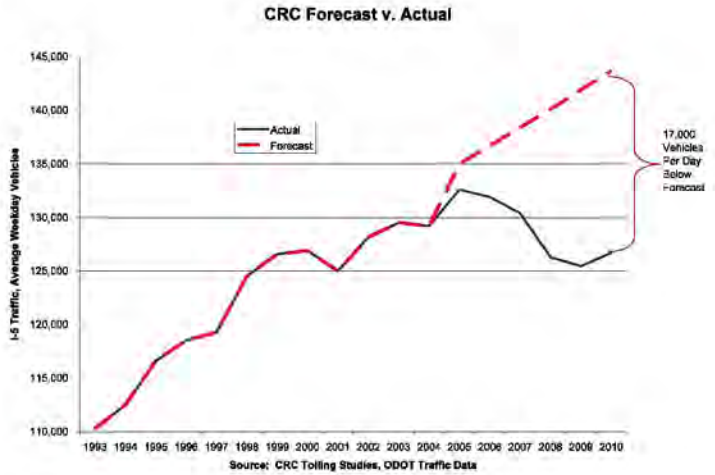
O-002-039

Assessing the environmental, social and land use impacts of the Columbia River Crossing project depends on accurate estimates of future traffic levels. The FEIS purports to offer very detailed estimates of traffic flows across the I-5 bridge and related roadways, through the year 2030.

The traffic and toll revenue forecasts prepared for the Columbia River Crossing are not accurate. The original forecasts were prepared based on 2005 base year data, and were published in 2007, and incorporated in the May 2008, Draft Environmental Impact Statement. The language in the FEIS and DEIS is virtually identical in many cases. The Columbia River Crossing has not produced new forecasts of travel since that time.

Actual traffic data show that CRC traffic projections are wrong. The CRC projections are that traffic on the I-5 bridges should have reached 143,700 vehicles per day in 2010. Actual traffic levels were 126,700 vehicles per day in 2010, 17,000 vehicles per day below the CRC forecast. These figures are based on our analysis of ODOT's data on traffic levels on I-5, through November 2010.

O-002-039



In addition, the question is not merely whether traffic is increasing again now, but whether they will recover to the previous levels, and whether they will grow at anything close to the rate CRC projected in the DEIS. The evidence shows the growth rate is much slower than forecast, raising serious questions about the project's financial viability.

The Treasurer's independent review of the traffic forecasts confirmed the flaws in CRC traffic forecasts. In 2011, the Oregon State Treasurer retained Robert Bain of RB Consult to review the CRC finance plan and traffic projections. Bain concluded that:

- Traffic and revenue analyses prepare for the CRC were unsuitable for credit analysis
- CRC traffic projections were confusing and outdated
- Authors of the traffic projections failed to examine historical data or verify their models against actual trends

O-002-039

- Diversion estimates to I-205 were "worrying."
- Overall, the CRC appears to have overestimated traffic.
- Toll revenue appears to be over-estimated by 25 percent.

(Bain 2011) in Indirect Impacts Folder.

Both ODOT and CRC consultants have concluded that the models used to estimate CRC traffic do not produce valid, accurate estimates of traffic for tolled facilities. In February 2009, the Oregon Department of Transportation received a report prepared by Parsons Brinckerhoff, David Evans and Associates Inc., and Stantec Consulting Services Inc. The authors of this report all happen to be contractors for the Columbia River Crossing project. The report is entitled *Tolling White Paper 3: Travel Demand Model Sufficiency*. This document is available on the Internet at the following address:

http://www.oregon.gov/ODOT/TD/TP/docs/LRPU/twp3.pdf in Indirect Impacts Folder.

ODOT's report finds that the current models used to forecast traffic in Oregon, and specifically in the Portland Metropolitan Area, including the Metro model, are inadequate to accurately predict traffic volumes on tolled facilities, such as the proposed Columbia River Crossing. Consider ODOT's summary of this report:

> Existing models in Oregon are rated as excellent for the purposes they were designed, and some are internationally recognized. However, Oregon models have not been specifically designed to evaluate toll projects, so **planners are not able to confidently forecast travel patterns for projects that are considering tolling/pricing. Existing models are not able to determine how travelers would change their mode, route, travel time, or destination in response to tolling/pricing.**
> Oregon Department of Transportation, Tolling and Travel Demand Model Sufficiency, Highlights of Tolling White Paper 3, March 2009, page 1, http://www.oregon.gov/ODOT/TD/TP/docs/LRPU/Highlight3.pdf#Tolling_White_Paper

O-002-039

_3 in Indirect Impacts Folder.
(Emphasis added)

As the ODOT study shows, the Oregon Department of Transportation and the principal contractors for the Columbia River Crossing concur that the traffic forecasting methods used by the CRC are not accurate or reliable. Accurate estimates of future traffic levels are central to assessing the need for this project, justifying its size, evaluating its environmental impacts, and most crucially, determining the viability of its financial plan.

The recession does not explain the decline in I-5 traffic, and in any case, CRC has not revised its traffic projections or impact analysis to reflect the much slower rate of growth.

It has been claimed that the decline in traffic since 2005 is attributable to the economic recession which began in December 2007. The current staff report alludes to this same argument, claiming that the traffic projections and financial documents need to be "recalibrated to reflect stalled economic growth." (Staff report, PDF page 30). Robert Bain, the consultant to the Oregon State Treasurer conclusively disposed of this argument in his report:

> Traffic volumes using the I-5 Bridge have flattened-off over the last 15-20 years; well before the current recessionary period. This is highlighted by the red dotted trend line in the chart below which was estimated up to and including the year 2006 (i.e. it omits the recent 2007 – 2010 period characterised by fuel price hikes and economic recession). The clear inference is that the flattening-off is a long-term traffic trend; not simply a manifestation of recent circumstances.
> (Bain 2011, page 3) in Indirect Impacts Folder.

And even though CRC financial plans now concede that DEIS projections are wrong, the traffic estimates in the FEIS—which form the basis of the claims about the project's environmental, social, traffic and economic impacts—have not been revised to reflect this new reality—they are essentially the same traffic figures given in the DEIS.

O-002-039

Most of the impact analysis in the FEIS is based, directly or indirectly, on comparisons of traffic levels between the no-build alternative and the proposed project, and these traffic level estimates are drawn from data that has been shown to be wrong, from models that are not even designed forecast traffic for tolled facilities like the CRC, and which have not been updated to reflect the acknowledged changes that have occurred since the DEIS was published. Consequently, the FEIS does not constitute a fair and reasonable analysis or disclosure of the environmental, social, and economic impacts of the CRC.

The FEIS fails to meet US DOT's own requirement that funding be reasonably available in the region's fiscally constrained transportation plan.

O-002-040

U.S. DOT policy requires that US DOT not approve a Final Environmental Impact Statement for any project for which reasonably available funding has not been identified in the region's approved fiscally constrained transportation plan. The US DOT's transportation planning requirements provide:

Table 2. Fiscal Constraint Requirement before Approving the NEPA Decision

Before a Final Environmental Decision (ROD, FONSI, CE) is approved in:	Fiscal Constraint must be demonstrated by:
Metropolitan Areas	• Entire Project is in the MTP • At least one subsequent phase of the Project is in the TIP (more if within TIP timeframe) • Full funding is reasonably available for the completion of the entire Project

Source: U.S. Department of Transportation, Office of Planning, Environment, and Realty, Supplement to January 28, 2008 "Transportation Planning Requirements and Their Relationship to NEPA Process Completion" February 9, 2011

Nearly all of the elements of the financial plan for the CRC are speculative or un-approved.

O-002-040

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O-002-040

A cornerstone of the CRC finance plan is the claim that $400 million will be available from the federal government as a result of an earmark or other discretionary funding, over and above funding that would otherwise come to the region, because of the alleged special character of this project. (The latest version of the plan actually assumes a $500 earmark in some scenarios).

For years, CRC advocates have traded on the idea that the CRC is a special project that will get funding from "a special pot" that wouldn't otherwise be available to the region, and that it wouldn't compete for dollars that could go to other projects, like federal formula funds. For example, earlier this year, Matt Garrett, ODOT director said:

> "Federal highway funds are being sought from a category known as Projects of National Significance. Very few projects in the country and no other projects in the region can compete for these funds . . . . These sources are unique to the CRC project and do not affect other Oregon projects."

Notice in particular three things about Mr. Garrett's statements. First, the passive voice and indefinite form "funds will be sought." Second, Mr. Garrett is silent on what would happen if these discretionary funds either aren't available, or fall short of the amounts being "sought." And third, Mr. Garrett in no way rules out seeking funding for CRC from other sources.

The just released FEIS Financial Plan, however, opens the door to using funding the CRC using federal formula allocations that are available for a wide range of projects in the region and the state. The financial plan tries to downplay the likelihood that these funds will be used.

"Federal Revenue and Financing Options"

Federal Formula Funds

O-002-040

ODOT, WSDOT, C-TRAN, TriMet, Portland's Metro Regional Government (Metro), and the Southwest Washington Regional Transportation Council (RTC) receive transportation funding from a variety of federal formula grant programs. In an urban area, the metropolitan planning organizations (MPOs) program these funds to specific eligible uses. In the Portland-Vancouver region, this is accomplished through Metro's or RTC's Metropolitan Transportation Improvement Program (MTIP) processes. State and federal funds are also programmed in ODOT's and WSDOT's State Transportation Improvement Programs (STIPs). While federal formula funds potentially could be used for the CRC project, many of these funds are currently programmed for other uses, and the finance plan for the CRC project does not anticipate reprogramming of these funds.
(Final Environmental Impact Statement, Finance Plan, Section 4.3.1, page 4-7)

It is clear from this wording that there is no definitive determination of whether any funds are actually available or committed for the CRC. The wording of the FEIS Financial Plan makes it clear that everything about the plan is effectively hypothetical, and will change later.

> As stated earlier, the financial plan scenarios discussed above are illustrative of the financial tradeoffs between the alternatives. The finance plan will be refined during final design, and the final plan may differ from the scenarios discussed above.
> (Final Environmental Impact Statement, Financial Plan, page 4-18)

The current illustrative financial plan scenarios are valid if, and only if, the CRC could obtain a $400 million to $500 million earmark or discretionary allocation. That was always at best just a speculation. Recent developments in Washington DC make it clear that it is a virtual impossibility.

ODOT Director Matt Garrett conceded there was currently no evidence that there would be any such funding available as part of the transportation reauthorization process:

> We thought there might be a specific project of national significance. At least with the language we have right now, the discretionary money is not really clear where that's going to present itself.

O-002-040

Matt Garret, Metro LUFO Hearing August 11, 2011

More recently, Peter DeFazio, a key legislator, whose support is vital to any federal funding, has repeatedly expressed his dismay about the size and cost of the CRC. On August 7, DeFazio told the Associated Press that the outlook for funding for the Columbia River Crossing is now "very, very, very, very grim." (Fought and Cooper 2011).

In the Oregonian on August 14, DeFazio said:

> "I kept on telling the project to keep the costs down, don't build a gold-plated project," a clearly frustrated DeFazio said. "How can you have a $4 billion project? They let the engineers loose, told them to solve all the region's infrastructure problems in one fell swoop... They need to get it all straight and come up with a viable project, a viable financing plan that can withstand a vigorous review."
> (Manning, Jeff. "Columbia River Crossing could be a casualty of the federal budget crunch", The Oregonian, August 14, 2011).

Later, DeFazio told Oregon Public Broadcasting:

> "I said, how can it cost three or four billion bucks to go across the Columbia River? . . . Now with the proposed Republican cuts in transportation . . . they want to cut this [transportation spending] by 35 percent, that means minimally we lose 600,000 to a million jobs and projects like this don't go forward. . . . Right now it's very problematic. . . . The Columbia River Crossing problem was thrown out to engineers, it wasn't overseen: they said solve all the problems in this twelve-mile corridor and they did it in a big engineering way, and not in an appropriate way.
> "Think Out Loud," Oregon Public Broadcasting, August 18, 2011.

Federal transportation funding faces major cutbacks. There are no earmarks or projects of national significance. As a result, CRC's funding strategy is tantamount to "bait and switch": advocates tell everyone that the federal money for the CRC will come from a "special pot" of earmarks that won't compete with other local projects, and but it should be increasingly clear that when this doesn't materialize, they will seek funding from all of the other sources of funds listed in the FEIS.

O-002-040

When they do, this will reduce the amount of money available for other projects in the region. Because the CRC is such a large project with a high risk of cost overruns, and because it faces revenue shortfalls from other funding sources, it would likely be a drain on the region's transportation financing capacity the next decade. Indeed, the recently released project schedule—which does not include phasing—extends the construction period to 2023. No one in the region has identified, approved, or committed funds for the construction of the CRC. Therefore, to move forward with this project would be a violation of US DOT's own policy requiring that the reasonable availability of funds for a project in a fiscally constrained plan be in place prior to approving the FEIS.

Historical data show that traffic levels on I-5 are declining, and prove that FEIS traffic estimates are inaccurate.

O-002-041

The levels of traffic crossing the I-5 and I-205 bridges are the central issue raised by this FEIS. The need for the project is predicated on the claim that traffic levels are steadily increasing, and that additional capacity is needed. The Environmental Impact Statement's claims hinge on a comparison of predicted future traffic levels with, and without the bridge.

Even though traffic is at the heart of the need for this project, and is central to evaluating and disclosing its environmental impacts, the FEIS contains a paucity of actual data on traffic levels. The baseline traffic levels reported in the FEIS are purported to represent 2005 "base year" conditions.

O-002-041

As these comments are copied from Mr. Joe Cortright's submitted comment letter, please see the responses to his letter (P-047).

O-002-041 The FEIS contains no actual data on current traffic levels over the I-5 bridges. The most recent data are from 2005.

According to the FEIS, the levels of reported traffic in 2005 was 134,000 vehicles per day. That figure is, in fact, not accurate. According to ODOT's published data, traffic in 2005 was 132,600 vehicles per day. If the FEIS does not even contain correct data about so-called "base year" traffic six years ago, how can anyone put any faith in the project's projections of traffic levels two decades hence?

We are a significant way (more than 20 percent) through the forecast period, and the FEIS contains no information that would enable one to validate the estimates contained in traffic projections. Actual data on traffic levels over the I-5 and I-205 bridges between 2005 and 2011 are omitted from the FEIS. The FEIS actually contains no historical time series data on traffic levels.

The CRC predicts sustained rapid growth in the no-build scenario, but has done nothing to validate its predictions, even though we have six years of actual experience since the base year of their projections. The base year for the forecasts of future traffic for the Columbia River Crossing is 2005, with a stated level of 134,000 vehicles per day. The CRC forecasts that traffic in the no-build scenario on the I-5 bridges will be 184,000 vehicles per day in 2030.

O-002-041

We now have nearly six years of experience—more 20 percent of the planning period--since the base year of the CRC traffic forecasts. CRC has done nothing to test whether their estimates have been borne out by actual experience.

The Oregon and Washington Departments of Transportation collect data that track the average level of traffic volumes on I-5 across the Columbia River. These data are reported by the Southwest Washington Regional Transportation Council. Data are from the council website: http://www.rtc.wa.gov/data/traffic/brdgawd.asp "Columbia River Bridges." The following table shows average annual traffic over the I-5 Columbia River Bridges for the past 15 years. It also displays the annual growth rate of traffic each year, compared to the preceding year, and the average annual growth rate for three five-year periods.

Average Daily Traffic, I-5 Bridges.

Year	Average Daily Traffic	Annual Growth Rate
1994	112,988	
1995	116,589	3.2%
1996	118,558	1.7%
1997	120,644	1.8%
1998	124,516	3.2%
1999	126,589	1.7%
2000	126,903	0.2%
2001	125,652	-1.0%
2002	128,162	2.0%
2003	129,657	1.2%
2004	130,279	0.5%
2005	132,603	1.8%
2006	131,916	-0.5%
2007	130,389	-1.2%
2008	126,278	-3.2%
2009	125,436	-0.7%

O-002-041

Annual Average Growth (Five-year Periods)	
1994-1999	2.3%
1999-2004	0.6%
2004-2009	-0.8%

This data shows several key trends. First, for the past four years, average traffic levels on the I-5 bridges have been declining, not increasing. Second, the growth rate in traffic on the I-5 bridges has been decelerating for the entire period shown in this table. Growth rates averaged 2.3 percent per year during the late 1990s, only 0.6 percent per year in the next five year period through 2004, and traffic decreased at an average rate of 0.8 percent per year for the past five years. Third, the slowdown in traffic growth rates and the annual decline in traffic clearly preceded the recession that began in December 2007.

It is apparent that the baseline forecast for growth of I-5 traffic included in the Final Environmental Impact Statement assumed a very dramatic acceleration in traffic growth from historical trends. To grow from a 2005 level estimated at 134,000 to a projected 2030 level of 184,000 in the FEIS base case, I-5 traffic would need to increase 1.3 percent per year over the 25-year period, 2005 to 2030. That would require more than doubling the rate of growth actually observed in the 1999-2004 period (0.6 percent). And as illustrated above, the historical data show that the rate of traffic increase has been decelerating (and now declining) and not increasing, as forecast in the FEIS. The FEIS and the traffic projections offer no explanation as to why the rate of increase of traffic should more than double from this long term trend.

Figure 1 shows the actual level of traffic reported by the Regional Planning Council (from the table above), and the forecast level of traffic growth required to achieve the 2030 projection of 184,000 vehicles per day. The actual level of traffic recorded in 2009 was roughly 14,000

O-002-041

vehicles less than the more than 140,000 vehicles per day implied by the CRC traffic forecasts. Whereas the CRC forecast implied that traffic over the I-5 bridges (in the no build scenario) would increase by almost 7,000 vehicles per day; in reality, the number of vehicles crossing the bridge declined by 7,000.

Figure 1: I-5 Bridge Traffic: Actual v. Predicted

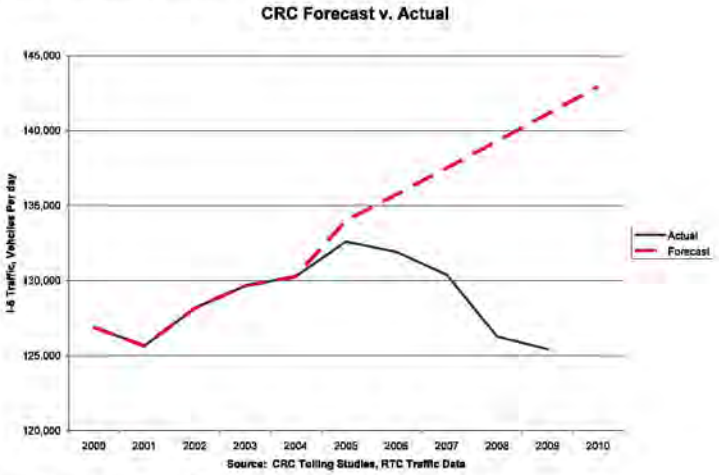
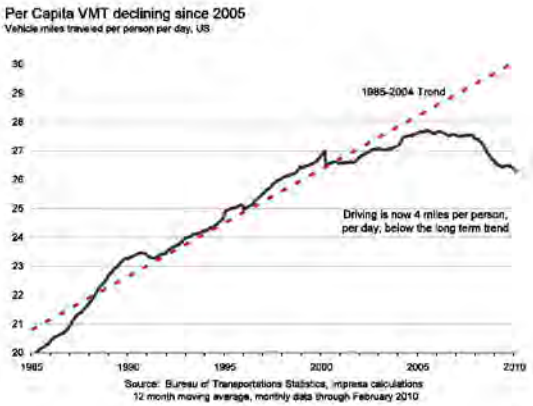


Figure 2: National Trends in Vehicle Miles Traveled

O-002-041



As Figure 2 makes clear, travel demand estimates based on pre-2005 trends are very likely to overestimate travel demand growth. Following the big increase in gas prices after 2004, American citizens began driving less. That trend has persisted over the past five years.

It might be argued that the past four years of declining traffic are a temporary aberration, and that in the longer term, forecast growth will make up for these declines. This is unlikely to be true for three reasons. First, as noted above, the trend has been for a decelerating rate of growth over the past 15 years. Second, as discussed below, changes in gas prices and consumer behavior that are very long term in nature are behind the decline in CRC traffic. And third, the departure from forecast experienced so far means it is likely impossible to make up the shortfall over the remaining time in the forecast period. In order to reach the expected No-Build 2030 traffic volumes of 184,000 from the actual 2009 level of traffic, traffic would have to increase by 1.85 percent per year for each of the next 20 years. That is a growth rate about forty percent faster

O-002-041

than the 1.30 percent forecast in the DEIS, and two and a half times faster than the 0.7 percent growth rate actually observed over the fifteen year period 1994 to 2009. The CRC project materials provide no basis for believing such a dramatic increase in driving will occur.

The tendency to overestimate future traffic levels in mature travel corridors is also apparently an endemic problem with the current methodology used to predict future transportation demand. After a careful review of the literature, the Government Accountability Office found:

> . . . current travel demand models tend to predict unreasonably bad conditions in the absence of a proposed highway or transit investment. Travel forecasting, as previously discussed, does not contend well with land-use changes or effects on nearby roads or other transportation alternatives that result from transportation improvements or growing congestion. Before conditions get as bad as they are forecasted, people make other changes, such as residence or employment changes to avoid the excessive travel costs. (Government Accountability Office, 2005)

The weakness of transportation models in accurately predicting future traffic levels is a continuing problem. So it is not merely the CRC traffic projection model that is problematic; rather the entire class of four-step (trip generation, assignment, mode, routing models) have proved inaccurate in practice. After an exhaustive review of the state of the art, the Transportation Research Board of the National Academies wrote:

> "In 2005, as has been true for the past four decades, these models could not provide accurate information to inform decision making on many transportation and land use policies or traffic operation projects."
> (Committee for Determination of the State of the Practice in Metropolitan Area Travel Forecasting, 2007)

While technology has allowed for faster computation, and more detailed mapping, they conclude:

O-002-041

> "The practice of metropolitan travel forecasting has been resistant to fundamental change. Every 10 years or so there begins a cycle of research, innovation, resolve to put innovation into practice, and eventual failure to affect any appreciable change in how travel forecasting is practiced."
> (Committee for Determination of the State of the Practice in Metropolitan Area Travel Forecasting, 2007) pages 123-124.

An "Investment-grade traffic forecast" would show substantially different traffic and pollution effects.

CRC has not prepared an investment-grade forecast. Investment grade forecasts use more realistic assumptions about travel behavior on tolled facilities. While in public statements, CRC officials have claimed that the investment grade forecast is a mere "refinement" of the forecasts contained in the FEIS, that is untrue. The investment grade forecasts show that traffic may be much more sensitive to tolls that allowed for in the FEIS models. For example, the Investment Grade Forecast prepared for the Washington State Department of Transportation showed that traffic levels on the 520 Floating Bridge would fall by almost half when tolls were introduced, because drivers would shift to the parallel and un-tolled I-90 bridge. (Wilbur Smith & Associates, Wilbur Smith Associates, "SR 520 Bridge Investment Grade Traffic and Revenue Study," Washington State Department of Transportation, August 29, 2011, http://www.wsdot.wa.gov/ NR/rdonlyres/A3B026EC-C9AF-4B43-BA31-4CB30FFD2CEB/0/SR520InvestmentGradeStudy. pdf,) in Indirect Impacts Folder.

The situation is nearly identical for the Columbia River Crossing. While the I-5 bridge is proposed to be tolled, the parallel I-205 bridge is not. Consequently, more traffic may be diverted from I-5 to I-205, producing much higher levels of congestion than estimated in the FEIS. The failure to accurately estimate traffic effects means that the FEIS does not comply

O-002-041

with NEPA because it doesn't reveal what the actual patterns of traffic will be under the LPA. CRC should be required to disclose the actual patterns of traffic than can be expected by undertaking an "investment grade" analysis prior as part of the NEPA review.

Metroscope estimates of induced demand effects are implausible and contradict FEIS travel estimates.

The FEIS relies for validation of its minimal impacts on land use on the Metro "Metroscope" model. The results of the Metroscope model are not plausible, and are not consistent with the literature on induced demand. The Metroscope forecast predicts that the existing 6 travel lanes on the I-5 bridge would accommodate 18,067 trips in the afternoon peak in 2030 under the No-Build alternative. In contrast, the LPA is predicted without tolls--with 10 lanes of traffic—is predicted would accommodate just 18,643 trips in the two hours of the afternoon peak in 2030. There is no reasonable basis for estimating that a 66% increase in capacity (3 lanes to 5 lanes) would produce only a 3% increase in traffic over the next decade compared to the no-build.

The Metroscope model is based in part on the Metro transportation forecasting model, which the Oregon Department of Transportation and CRC consultants have determined are not capable of accurately predicting traffic on tolled facilities.

In addition, there is no evidence that the Metroscope models are consistent with, or support the traffic forecasts contained in the FEIS. The FEIS claims that automobile traffic during the PM peak hour would be 33% higher under the LPA than under the No-build (FEIS, Summary, Exhibit 18). The Metroscope model claims that automobile traffic during the PM peak hour

O-002-041

would be 10% lower under the LPA than under the No-Build (Metroscope, Figure 3.3-1 2030 PM 2-Hour Travel Time Histograms by Alternative, page 25). Far from confirming the findings of the FEIS, the Metroscope model contradicts them. With plainly contradictory evidence that is unexplained by the FEIS, no one can reasonably assume that the FEIS accurately characterizes the environmental impacts of the LPA.

Projections grossly over-estimate base case traffic, and under-estimate induced demand, thereby biasing estimates and concealing the project's true environment impacts.

It is evident that the FEIS creates a fictitiously high level of predicted no-build traffic for two reasons. First, this creates a justification for the project. Second, it enables the project to claim that the traffic volumes created by the LPA will be less than the artificially inflated "no-build" scenario, and will therefore have fewer impacts.

Models fail to adjust for changing gasoline prices and dramatic shift in traffic trends.

The modeling for the CRC is based on 1994 vintage regional transportation surveys, and implicitly assumes that gasoline prices will be low and stable. It does not reflect the tripling of gasoline prices in the past decade or their effects on travel behavior, mode choice, and land use development patterns.

CRC traffic forecasts appear to be badly out of date, and there is no evidence that they have been adjusted to deal with current gasoline prices or development trends. The CRC traffic forecasts are poorly documented, and don't indicate what baseline data were used, what assumptions were

O-002-041

made, and what error and uncertainty factors are associated with these estimates. It appears from the documents included in the Draft Environmental Impact Statement that traffic projections were made in 2007, based on 2005 data. The key measures of traffic activity (184,000 crossings of the I-5 bridge in the no-build, and 178,000 in the build alternatives), have remained essentially unchanged for several years. (See for example, Draft Environmental Impact Statement, Summary, Exhibit 26 Summary of Transportation Effects and Cost for Each Alternative, Page S-30). The forecast documents, including those released in 2010, use the same numbers (184,000 in the no-build, and 181,000 for the LPA) as the project has publicly quoted since the DEIS was released in 2008. The forecast documents refer to the "current year" for traffic purposes as "2005." The modeling was based on Metro's transportation model (Columbia River Crossing, 2010f). The Metro model was calibrated based on behavioral data collected in 1994 and assumes that real gasoline prices would not increase at all, i.e. that gasoline prices increase no faster than the rate of inflation (Higgins, 2008) in Indirect Impacts Folder.

There is clear evidence that the persistently much higher level of gas prices since 2005 has produced a sea change in consumer behavior. Nationally, per capita driving has been in decline since 2004, and is now at 1999 levels.

Consumers are not only driving less, but are scrapping cars faster than they are buying new ones. Nationally, the number of vehicles in operation declined by four million in 2009 (Brown, 2010). In Oregon, vehicle registrations have declined by 30,000 compared to the previous year (Har, 2010).

O-002-041

The rise in gasoline prices and a growing interest in alternatives to car-dependent living has triggered a shift in housing markets within metropolitan areas. The biggest price decreases in housing and the highest foreclosure and default rates have been recorded in outlying suburban locations (Cortright, 2008) in Indirect Impacts Folder..

The CRC's transportation model is based on observations made in 2005, and assumes the consumers will continue to behave as they did in 1994 (when gasoline cost $1.10 gallon). As a result CRC predicts the rate of increase of vehicle travel will be double that of the previous decade. This is highly suspect in a world where gasoline prices have more than doubled, where driving is in decline, and consumer behavior patterns are obviously changing.

A wealth of evidence shows that car ownership is declining, the number of young drivers is declining, that vehicle miles traveled are declining, and that gasoline sales are declining, both nationally and in Oregon and Washington. The FEIS contains no analysis of these trends. See for example articles by Williams-Derry, 2011 in Indirect Impacts Folder.

FEIS claims about induced demand are incorrect and the FEIS summary of induced demand literature distorts the professional consensus.

O-002-042

The FEIS misrepresents the academic literature on induced demand and distorts the findings of its own literature review.

The FEIS report on Indirect Effects (Appendix A, page A-1) reports that the predecessor of the CRC commissioned Parsons Brinckerhoff to conduct a literature review of 75 studies of the effect of transportation facilities on demand. While the text of the report purports to summarize

O-002-042

As these comments are copied from Mr. Joe Cortright's submitted comment letter, please see the responses to his letter (P-047).

O-002-042

the findings of the report, the FEIS neither includes quotations from the actual report or the report itself. I obtained a copy of the report. Among its conclusions:

> 1.5. Households reinvest travel time savings in longer trips and more travel.
> Household location choice is influenced by many factors including: housing costs, access to jobs, access to goods and services, type of community, amenities/quality of life, public services/schools and property tax rates. The more numerous non-work trips for personal, family, civic, education, and recreation, may prove to be equally as significant as the work trip in housing location choice, especially for multiple worker households. Evidence suggests that households do not locate so as to minimize their travel distance from work; rather, they tend to keep their overall travel time within a certain amount, Despite differences in travel conditions and opportunities across US cities over the past 20-year, people spend the same amount of time per day, on average, in travel. The stability in commuting travel times suggests that transport accessibility improvements will allow households to locate further away from jobs, and that that any travel time savings may be used for more travel. (In the Vancouver-Portland region it may lead to household locations in outlying cities, rather than in the "rural sprawl" that typifies most other metropolitan areas.) The development shift to the suburbs in the past few decades initially reduced commute travel times as housing and jobs co-located along previously uncongested freeways. However, the increased traffic congestion of suburban areas has led to larger increases of late in suburban commute times.
> Parsons Brinckerhoff, Land Use-Transportation Literature Review For the I-5 Trade Corridor Regional Land Use Committee, September 17, 2001, page 12

The latest literature on induced demand—which is not addressed in the FEIS or DEIS—takes the very strong view that additional transportation capacity directly induces additional travel. One paper published by the National Bureau of Economic Research, elevates the proposition to a "fundamental law"—finding that for interstate highways in metropolitan areas distances traveled increase one for one with interstate highway lane miles. (Duranton & Turner, The Fundamental Law of Road Congestion: Evidence from US Cities, National Bureau of Economic Research, 2009, No. 15376).

Moreover, the FEIS too narrowly defines induced demand to be demand resulting from changes in land use patterns due to changes in accessibility. This is only one of several sources of

O-002-042

induced, or generated demand. Additional transportation system capacity can cause more and longer trips even without changes in land use patterns. See for example Litman:

> Traffic congestion tends to maintain equilibrium. Congestion reaches a point at which it constrains further growth in peak-period trips. If road capacity increases, the number of peak-period trips also increases until congestion again limits further traffic growth. The additional travel is called "generated traffic." Generated traffic consists of diverted traffic (trips shifted in time, route and destination), and induced vehicle travel (shifts from other modes, longer trips and new vehicle trips). Research indicates that generated traffic often fills a significant portion of capacity added to congested urban road.
> Litman, Todd, Generated Traffic and Induced Travel, Implications for Transport Planning, Victoria Transport Policy Institute, 8 June 2011, in Indirect Impacts Folder.

O-002-043

The results of regional travel demand models were manually adjusted by CRC advocates to shift additional traffic to I-5.

The models used to predict traffic are purported in the FEIS to be robust, verifiable, and scientific. But in fact, the Metro travel model is a black box, with the key factors driving predicted outcomes not accessible to outside scrutiny. In addition, the CRC officials concede having manually adjusted the outputs of the model to produce different results.

While the CRC traffic forecasts based their initial estimates on the regional transportation model, they adjusted these estimates to shift some forecast traffic from I-205 to I-5. The authors of the study labeled this manual adjustment "post-processing"—but it simply means that they used their own judgment to select higher values for I-5 than those produced by the regional transportation model. The reasonableness of this adjustment is debatable. The CRC claims that an analysis of 2005 actual traffic data shows that actual traffic on I-5 was underestimated, relative to I-205 by the regional model. The authors made no apparent attempt to see if their adjustment was supported by data in any subsequent year. But each year after 2005, traffic volumes have been

O-002-043

As these comments are copied from Mr. Joe Cortright's submitted comment letter, please see the responses to his letter (P-047).

O-002-043

proportionately higher on I-205 than I-5, undercutting the stated basis for this "post-processing" adjustment.

According to the report, the effect of the "post-processing" adjustment was to increase traffic volumes assigned to the I-5 bridges by 6 percent over the levels predicted by the regional transportation model without this modification.

The report concedes:

> However, the post processing methodology forecasts less traffic diversion from I-5 to I-205; forecasted 2030 average weekday volumes on the I-5 Bridge are about 6 percent higher with the post-processing methodology than with the regional travel demand models.
> (Columbia River Crossing, 2010b).

The effect of this adjustment is to understate the amount of diversion that will occur to I-205, even with the relatively high value of time estimates used in the travel demand model.

Despite its technical sounding name "post-processing" really represents a judgment on the part of the CRC to disregard the outputs of the Metro travel demand model, and to manually choose the values for traffic.

CRC has failed to disclose visual impacts.

O-002-044

The Columbia River Crossing will have an enormous impact on the views from downtown Vancouver and on Hayden Island. The project will cross the river approximately 70 to 80 feet in the air, and touch down up to a quarter mile away. Almost nothing in the Final Environmental

O-002-044

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O-002-044

Impact Statement reveals how this massive structure will affect the views and light of human beings standing on the ground anywhere near the structure.

The project's visual impact technical report contains only a handful of computer simulated images of the bridge. All of them are taken from distant points floating in the air (where no human being will ever actually perceive the structure). For example, Figure 4.8 shows the bridge from a point somewhere along Hayden Island riverfront, several hundred feet east of the bridge, using a "wide angle" perspective that diminishes the perceived height of the structure." Figure 4-12 shows the bridge from a point hovering several hundred feet above downtown Vancouver. Figure 4-13 shows a portion of the structure relatively close up, but again, from the perspective of someone floating somewhere in the air, and not on the ground. Figure 4-13 also depicts the now discarded open-web design, rather than the truss currently proposed.

The decision to present such a limited and artificial set of perspectives represents a conscious attempt on the part of the sponsoring agencies to conceal the project's visual impacts. It is a decades-old gambit: Robert Moses used the same scheme to try to sell the Brooklyn-Battery Bridge in the 1930s. He concealed the fact that the bridge would have obliterated views from the ground (and lower ten stories of buildings) in Lower Manhattan, by showing the bridge as it might be viewed, in the words of Robert Caro "by a high flying and myopic pigeon." (Caro, Robert. 1976. The Power Broker. Page 464) in Indirect Impacts Folder.

Under NEPA, the sponsoring agencies have an affirmative responsibility to disclose the impacts the project will have on the environment, including the viewshed. The presented FEIS not only

O-002-044

fails to do so, but presents evidence that conceals and distorts the bridge's visual impacts. As such, the FEIS fails to comply with NEPA, and the agencies should be directed to present a fair and accurate set of renderings disclosing the visual impact as it will be perceived by humans standing on the ground near the structure.

Despite making major changes to the project, the CRC did not undertake a supplemental environmental impact statement, as required by NEPA.

O-002-045

The FEIS claims:

Both agencies concluded from these determinations that these changes and new information would not result in any new significant environmental impacts that were not previously considered in the DEIS. These changes in impacts are described in Appendix O of this FEIS. (FEIS, page 2-86.)

The implication is that the standard is "new significant environmental impacts." But this is not the standard that triggers the need for a supplemental environmental impact statement. The standard is whether there are significant changes to the project.

The project is changed is several ways: The footprint on Hayden Island is significantly different. An arterial bridge is being built to Hayden Island. The bridge will be a composite truss, not an open-web. The number of lanes on the bridge will be different. AT least one of the garages in downtown Vancouver is proposed to be built partially underground, and not entirely above ground as in the DEIS. The size of the Clark College park and ride lot has been more than doubled. The new stacked design will have substantial adverse impacts on the bridge's highly touted bicycle and pedestrian facilities which are now reduced in size and relegated to the lower level of the stacked bridge. Moreover, because the project is likely to be phased, and there is no

O-002-045

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O-002-045

certainty as to which phases will actually ever be completed, the project as completed may be very different than the one described in the FEIS, with different environmental impacts.

CRC proponents have implied that the full build FEIS represents the envelope of maximum impacts, and that any smaller project would have lesser impacts, but that is not correct. Some aspects of the project have environmental benefits (tolling, transit), and others have negative environmental effects. Implementing just a portion of the project would likely divert traffic to different locations, with different effects. Prior to issuing a record of decision, DOT should prepare an FEIS that reflects the actual project proposed to be built, and not one that may include many components or features that may never be constructed.

The sponsoring agencies cannot know whether there are "significant impacts" from these changes without undertaking a supplemental environmental impact statement. Moreover, the objectives of NEPA—giving the public the opportunity to review and comment on this analysis of impacts—is thwarted if the sponsoring agency is allowed to make substantial changes to a project after the DEIS.

Conclusion

O-002-046

The CRC's LPA and FEIS are living proof that dinosaurs, at least transportation dinosaurs, are not extinct. Under NEPA, and the ESA, the citizens of Oregon and Washington are entitled to an FEIS that actually considers transportation options other than expanding highway capacity and that fully and objectively evaluates all of the adverse impacts, including in particular the impacts on threatened salmon, of the CRC's highway expansion proposals. The FEIS actually issued by the CRC and approved by the Federal agencies does neither of those

O-002-046

The FEIS and related documents, as well as the process of involvement, coordination and consultation, satisfy the requirements of NEPA and other environmental regulations for the proposed CRC project. Please see the findings in the Record of Decision, as well as responses to comments above.

O-002-046

things. For all the reasons set forth above, PEAC respectfully requests, on behalf of its clients listed below, that the responsible federal agencies and the CRC Task Force withdraw the CRC FEIS and issue a corrected Supplemental DEIS for public comment.

Respectfully submitted,

/s/Tom Buchele

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Dated: October 24, 2011

HAYDEN ISLAND LIVABILITY PROJECT

October 23, 2011

Columbia River Crossing
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700 Washington Street, Suite 300
Vancouver, WA 98660

O-003-001 The following comments are submitting on behalf of the Hayden Island Livability Project in response to the Final Environmental Impact Statement for the Columbia River Crossing Project.

I. INTRODUCTION

The Hayden Island Livability Project (HILP) is an organization comprised primarily of residents from the Hayden Island Manufactured Home Community (HIMHC), a majority of who are elderly and low-income with increased rates of health concerns. Broadly speaking, HILP objects to the adequacy of the Final Environmental Impact Statement (FEIS) in that it fails to analyze and address the disparate impacts the project will have on the community, including but not limited to increased cumulative air toxics, decreased access to vital community resources and amenities, increased health risks and diminished quality of life. The methodology used by the Columbia River Crossing agency in determining the demographic characteristic of the community is invalid and masks the true nature of the community as significantly low-income relative to the City and County median household income. The FEIS fails to identify environmental justice impacts and fails to address appropriate mitigation of these impacts.

II. EXECUTIVE SUMMARY

A. Proximity of Staging Area

The FEIS is insufficient because there has not been a decision on the staging area location. The impacts to the HIMHC will be severe if the Thunderbird Hotel is chosen as the staging ground, yet the FEIS does not analyze these impacts. The Thunderbird Hotel likely contains asbestos, lead and other toxins and is on the community's fenceline, and the staging area activities will emit substantial air toxics and dust.

B. Loss of Safeway Grocery

The Safeway grocery store is the island's only source of fresh food and prescription medication. Many community residents are elderly with limited mobility, and rely on the Safeway for their basic food and medicinal needs. The analysis of the impact to the community due to the loss of Safeway is inadequate, as is the analysis of the alternatives and mitigation options.

O-003-001

Thank you for submitting comments. Specific responses to your comments are provided below.

C. Bridge Access and Utilities Interruption

O-003-001

The FEIS fails to sufficiently address impacts caused by diminished access for island residents and emergency vehicles on and off of the island, as well as disruption of vital utilities due to construction of the bridge and the Hayden Island interchange. CRC must commit to constructing the local access bridge first to ensure continued access on and off of the island.

D. Air Quality

The FEIS fails to consider baseline or existing levels of air toxics and therefore insufficient in its analysis of cumulative (and) health impacts as a result of increased air pollution, both due to construction and increased traffic. NEPA requires hot-spot testing and analysis for a construction project lasting longer than five years that could result in increased carbon monoxide and particulate matter emissions, and environmental justice requires identification and analysis of alternatives and mitigation measures.

E. Noise/ Vibration

Assuming the staging site is going to be at the Thunderbird Hotel, the FEIS fails to analyze the impacts due to noise and vibration stemming from the construction staging ground site, as well as the cumulative noise and vibration impacts in the surrounding community.

F. Hazardous Material

Assuming the staging site is going to be at the Thunderbird Hotel, the FEIS fails to analyze the impacts due to hazardous materials, namely asbestos and lead stemming from demolition.

G. Environmental Justice

The FEIS failed to use appropriate methodology to determine the median household income of the block groups comprising the Hayden Island Manufactured Home Community. The use of Census tract demographics for Hayden Island masks the true low-income characteristic of the 1,300 HIMHC residents, comprising two-thirds of the island's population. CRC was inconsistent in its methodology by relying on Census block group data for Vancouver and North Portland communities. CRC also failed to compare median household income to regional income data. The use of the federal poverty line is inadequate to determine whether potentially impacted communities are low-income environmental justice communities pursuant to Executive Order 12898 and the FTA's Draft Circular on Environmental Justice. HIMHC residents were also precluded from meaningful participation in the development process in violation of NEPA.

H. Project Scoping and Alternatives Analysis

Although the CRC project is a regional transportation project, he FEIS fails to adequately analyze regional impacts, particularly considering the I-205 freeway crossing that is at maximum capacity and the potential alternatives including enhanced railroad or third crossings that would avoid, reduce or mitigate impacts to the HIMHC.

III. SPECIFIC COMMENTS

A. PROXIMITY OF STAGING AREA

O-003-002

- The FEIS is insufficient because a staging area for construction has not been identified, therefore precluding analysis of the impacts due to the staging area.
- The FEIS fails to identify how long the staging area will be in operation, therefore avoiding the requirement to conduct a carbon monoxide and particulate matter analysis.

B. LOSS OF SAFEWAY GROCERY

O-003-003

- The Safeway grocery is the only store on the island serving fresh food and prescription medication. Of the approximate 1,300 HIMHC residents, approximately two-thirds are over the age of 65, and approximately one-third cannot drive. Many of the elderly residents have limited mobility and require mobility assistance devices. The FEIS identifies and acknowledges that residents living near the Safeway who have limited mobility or disabilities will be impacted by the loss of the Safeway, but fails to analyze the specific disproportionate impacts to the health and well-being of HIMHC residents.
- The FEIS fails to adequately analyze alternatives to avoid or mitigate the impacts due to the loss of the Safeway. The FEIS lists four alternative groceries, none of which are accessible without vehicle use, and it fails to analyze the specific disproportionate impacts to the elderly HIMHC residents with limited mobility or disabilities. These residents will not be able to access the alternatives listed in the FEIS.
  - Cash in Carry: primarily for restaurants and only sells in bulk
  - Fred Meyer (Vancouver): 4 miles away, residents will likely have to pay toll
  - Fred Meyer (Kenton): 4 miles away, residents must use light-rail and carry groceries
  - New Seasons (North Portland): 3.6 miles away, too expensive for HIMHC residents
  - Home delivery: too expensive for HIMHC residents, requires internet access, credit
- The FEIS incorrectly states that the project will not affect a resource of importance to a low-income population (Section 3.5, Question 2). A majority of the HIMHC residents are low-income, and have voiced their concern over losing the Safeway store to CRC for more than two years. CRC failed to analyze the community's reliance and dependency on the Safeway store as a critical resource providing access to fresh food and prescription medication necessary for their health and well-being.
- The FEIS incorrectly states that the project would not have disproportionately high and adverse impacts on a low-income population relative to more affluent populations (Section 3.5, Question 4). A basic review of the demographics of Hayden Island shows that the HIMHC residents comprise two-thirds of the total island population and that a majority of HIMHC residents are low-income while many of the residents living east of

O-003-002

There are five possible staging areas identified in the FEIS. Please refer to Section 2.3.3 for more detail about these areas. These staging areas could be used by a contractor, or they may choose their own. It is typical during the planning and NEPA environmental impact assessment stage to identify likely staging areas. The project has done so, assessed potential impacts in and near these areas, and has sought to balance many criteria in this selection process, including minimization of impacts to adjacent neighborhoods.

A contractor will determine the exact activities that will occur on any of these sites, or any other site to be used for staging or casting. The contractor, working closely with the DOTs, will evaluate impacts and apply appropriate mitigations, in compliance with applicable federal, state and local regulations. It has been thought that activities at any one staging area would occur for less than five years, for which no CO, PM10, and PM2.5 hot-spot analyses would be required. The project will work closely with contractors to determine a use plan for each area. If any site is to be used for more than five years, there will be a hot-spot analysis completed.

O-003-003

The project has attempted to avoid the displacement of any businesses, though it is not always possible. The project will continue to look for ways in which impacts can be avoided and minimized. The displacement of Safeway is documented in the FEIS (sections 3.3.3, 3.4.3 and in numerous places in 3.5). Mitigation for this impact is governed by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. The project will suggest that Safeway relocate on Hayden Island, but cannot require them to relocate in any specific location. The eventual relocation will be a business decision by Safeway. We have been informed that there will be a Target grocery store and pharmacy as part of the redevelopment plan for the Jantzen Beach Super Center. We

O-003-003

the bridge project are more affluent. The project will disproportionately impact the majority of low-income HIMHC residents, who cannot take advantage of alternative groceries or pharmacies off the island to the same degree of the more affluent residents east of the bridge project, who have greater mobility and transportation access.

C. BRIDGE ACCESS & UTILITIES INTERRUPTION

O-003-004

- HIMHC has a high percentage of elderly and disabled residents and residents with poor health, thus necessitating unmitigated access to emergency medical vehicles. Any delay in the arrival or departure of emergency medical service could result in permanent injury or death. The I-5 freeway interchange on Hayden Island is currently the only on/off access to the island. The FEIS acknowledges that the project will result in temporary closure of interchange ramps due to demolition and construction. Even if only one directional ramp is closed at a time, the additional time needed to go north into Vancouver and turn around could be the difference between life and death.

- Option A (the Locally Preferred Alternative), contains a local access bridge that would provide alternative access for residents and emergency medical vehicles. Option B does not contain this local bridge, and the FEIS fails to analyze the impacts to HIMHC residents.

- The FEIS fails to identify phased construction alternatives as mitigation for the disproportionate impacts borne by HIMHC residents, and to analyze the disparate impacts of those alternatives. Building the local access bridge first is necessary to ensure uninterrupted access for emergency medical vehicles.

- The FEIS acknowledges that CRC is "especially aware of the sensitive circumstances on Hayden Island" regarding utilities interruption (including water, electricity and sewage services). Yet the FEIS fails to analyze the potential significance of these impacts on HIMHC residents. Given the "sensitive circumstances," namely, elderly and young residents with limited mobility, disabilities and poor health, CRC should analyze the health impacts caused by interruption of utilities, and identify alternatives and mitigation.

D. AIR QUALITY

O-003-005

- The FEIS failed to adequately analyze the potential significance of impacts from air toxics because it does not establish the staging area for construction. The FEIS identifies the current site of the Thunderbird Hotel, on the fenceline of HIMHC, as a possible staging area location, reinforced by informal discussion with CRC staff over the past two years. The FEIS fails to adequately analyze the health and cumulative impacts to HIMHC residents from construction equipment and off-road mobile emissions. CRC should have conducted such analysis in advance of the FEIS to determine whether alternative sites exist that would not result in such disproportionate impacts.

- The FEIS fails to identify and analyze the impacts to HIMHC residents as a result of both air toxic emissions from project construction as well as increased traffic after the bridge

understand that officials representing the Super Center initiated a site plan review with the City of Portland for a relocation and expansion of the Target store. Plans submitted to the City of Portland's Bureau of Development Review indicate that the store could include a grocery and a pharmacy. The plans show, for the Super Center as a whole, a space for a pharmacy, and at least one space for a grocer. We will continue to track this as redevelopment occurs.

O-003-004

The project will work with emergency service and utility providers as the design for the LPA and the approach to construction is further refined. The project has already made commitments to maintaining three through lanes, and to construction-period transit enhancements. The possibility of early construction of the local multimodal bridge will continue to be a consideration by the project as project sequencing is refined. It is discussed in Chapter 2 of the Draft FEIS, (Section 2.3.1), but not as mitigation.

O-003-005

The bullet points below respond directly to your comments (in order):

- See the response to comment O-003-002.
- The air quality evaluation presented in the DEIS assessed how emissions would be expected to change by 2030 and how the project would affect emissions of pollutants regulated by state and federal standards as well as vehicle emissions that are not regulated. Oregon and Washington, as well as the federal government, have established ambient air quality standards for criteria pollutants. These standards are based on human health risks. The DEIS evaluation included an analysis demonstrating that the CRC project would allow the region to retain conformity with state and federal air quality standards for relevant criteria pollutants. See the Air Quality Technical Report for a detailed explanation of

O-003-005

project is completed. CRC is required to analyze both the health and cumulative impacts of the project. Analyzing cumulative health impacts requires analysis of the background, or existing, pollution in the community. The community is currently adjacent to a major construction redevelopment project at the Janzten Beach Mall. CRC failed to conduct a baseline assessment of air quality in order to determine if the construction project will result in additional air toxics above health-based benchmarks. CRC also failed to assess mitigation alternatives such as on-site air quality monitoring.

- The FEIS fails to take into account the particular susceptibility of the community. The majority of elderly residents with existing health concerns or disabilities (a significant number of residents depend on oxygen tanks) are likely more susceptible to any increase in air toxics. Air toxics from demolition, non-road mobile emissions (construction), and on-road mobile (vehicles) will disproportionately impact HIMHC.

- The FEIS fails to adequately analyze the wind patterns on the island to determine the degree of air pollution impacts. HIMHC is directly downwind from the Thunderbird Hotel, the likely staging area for the construction, and in close proximity to the major construction of the Hayden Island interchange and bridge project itself. HIMHC residents will suffer a disproportionate adverse impact due its proximity to this construction.

- The FEIS fails to provide any specific details regarding "prompt removal" of dust pursuant to the dust control plan, nor does it specify the types of chemicals that will be used to control dust. The HIMHC contains significant elderly and young populations who are more susceptible to dust inhalation, and the CRC must analyze the likely impacts to the community and identify mitigation alternatives.

- Under the transportation conformity rules (40 CFR 93.123(c)(5)), CRC must conduct carbon monoxide and particulate matter hot spot analyses for any construction activity lasting more than five years. CRC did not conduct a hot spot analysis for the potential staging areas, the Hayden Island interchange site or the local access bridge site, yet the FEIS fails to analyze the likelihood of concentrated construction activity lasting longer than five years. The health of HIMHC residents will be disproportionately adversely impacted should concentrated construction activity at the Thunderbird Hotel staging area, the Hayden Island interchange or local access bridge last longer than five years.

E. NOISE/VIBRATION

O-003-006

- The FEIS acknowledges potentially significant impacts from noise pollution and identifies noise-dampening walls to mitigate this impact for Vancouver residents, but does not identify specific impacts or mitigation for HIMHC residents. HIMHC residents are likely more susceptible to chronic noise impacts given the average age and health of residents. The FEIS fails to adequately analyze cumulative health impacts, including long-term impacts, and alternative actions or mitigation for HIMHC residents.

- The FEIS fails to analyze the degree to which contributing noise from staging area activities are likely to exceed DEQ Noise Source Standards, disproportionately impacting

5

the state and federal regulations concerning air quality and the evaluation of how the project complies with relevant air quality regulations. See Section 3.10 of the FEIS for an updated explanation of the pollutants regulated by state and federal law.

- Projected reductions in vehicle fleet emissions would result in a 25% to 90% reduction in I-5 related criteria pollutant emissions over existing conditions, even with the anticipated growth in population, employment and VMT. In addition, the build alternatives would provide small further reductions in vehicle emissions at the regional level and for most pollutants in each of the subareas along I-5. CO and NOx emissions would be slightly higher with the project than with No-Build (but still lower than existing conditions) in the I-5 subarea between the SR 14 and SR 500 interchanges, as discussed in DEIS Chapter 3 (Section 3.10) and FEIS Chapter 3 (Section 3.10). The updated analysis conducted for the FEIS resulted in very similar findings to those in the DEIS.
- The project has committed to the following mitigation measures as described on pages 3-283 to 3-285 of the FEIS:
  - Control dust and exhaust emissions from demolition and construction activities.
  - Require contractors to comply with State of Oregon standard specifications (Section 290) fordust, diesel vehicles, and burning activities.
  - Follow State of Oregon's specifications for truck staging areas for diesel-powered vehicles.
  - Use ultra low sulfur diesel for diesel construction vehicles and equipment, or otherwise comply with any new, more stringent regulations in place at the time of construction.
  - Pursue emerging technologies for cleaner construction emissions, like the use of diesel scrubbers for compatible equipment, and continue to encourage and require those types of technologies as bidding laws allow.
  - Require stationary sources, such as concrete mix and asphalt

O-003-006

HIMHC. The FEIS fails to identify and analyze mitigation measures for noise impacts as a result of the use of the Thunderbird Hotel as the primary staging area.

- The FEIS fails to analyze the potential significant impacts from vibration due to project construction and staging area activities on the HIMHC residents. Specifically, the homes in HIMHC are not secured to a foundation and the island itself is fill. Residents' homes, other real and personal property, and residential health and safety could be impacted by vibration caused by project activities.

- The FEIS acknowledges that HIMHC residents are concerned about proximity to the staging area site, yet does not adequately analyze the potential impacts. A statement that "the project has organized many meetings to hear and address these concerns" is inadequate.

F. HAZARDOUS MATERIALS

O-003-007

- The FEIS acknowledges that the Thunderbird Hotel, the likely site for the project staging area, is a former landfill, former site of an auto service station, and is known or suspected to contain pre-existing soil and/or groundwater contamination. CRC has not conducted any testing or screening of this site to determine the extent of contamination. The structure itself may contain asbestos and/or other hazardous toxic materials, all of which may be released into the air, soil and groundwater if the structure is demolished. The FEIS has therefore failed to adequately analyze cumulative health impacts of the project.

- The FEIS acknowledges that the project will result in a minimum of three hazardous materials sites impacting the HIMHC, yet does not identify or commit to remediation of these sites during and after construction.

- The FEIS fails to identify exact locations of the 23 properties older than 1980 being demolished due to the project. These properties are more likely to contain asbestos and lead paint, which may become airborne or contaminate the soil or groundwater. HIMHC residents have been precluded from meaningful participation in the NEPA process with respect to hazardous materials due to CRC's failure to disclose specific necessary information.

G. ENVIRONMENTAL JUSTICE

O-003-008

- The FEIS in inadequate because it fails to recognize the HIMHC as an environmental justice community. There are approximately 1,300 residents of the HIMHC, the majority of which are low-income, elderly residents with limited mobility and/or disabilities with exacerbated health concerns living on social security disability or fixed incomes. CRC utilized an inconsistent and inadequate methodology to determine the demographics of Hayden Island residents. Despite the use of Census block groups to determine the race and income demographics of potentially impacted Vancouver communities and the racial composition of potentially impacted North Portland communities, CRC used the entire Census tract, comprising the entire island, to determine demographics of island residents.

plants, to obtain an Air Contaminant Discharge Permit from either DEQ or SWCAA and to comply with regulations for controlling dust and other pollutant emissions.
    - Manage construction materials and activities to minimize dust, glare and smoke.
- The dust management plan for construction will establish specific protocols for these potential impacts. And the project will coordinate closely with the public on these plans.
- See the response to comment O-003-002.

O-003-006

The noise study in the FEIS was performed in accordance with regulations from the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Oregon Department of Transportation (ODOT), and the Washington State Department of Transportation (WSDOT). The regulations are designed to protect the health and welfare of communities with maximum allowable noise levels from transportation noise. For highway noise in Oregon, the state and federal criteria for consideration of noise abatement is a peak hour Leq of 65 dBA. A detailed traffic noise analysis was performed for the nearest homes at the Hayden Island Manufactured Home Community represented by receivers PD-9 and PD-10. Under the full Build Alternatives, the future noise levels are predicted at 61 dBA Leq, an increase of 4 to 5 dB over the current levels of 56 to 57 dBA. Therefore the future noise levels are within the federal and state criteria and no noise abatement measures are required. Noise levels in Vancouver, where noise abatement is recommended, range from 66 to 77 dBA Leq or more; therefore, noise barriers are recommended. This is because the residences are as close as 50 feet from the highway, while the residences at the HIMHC are over 500 feet from the new bridge. Also, the noise impact criteria does not differentiate residences based on age, race, religion, or other demographics. All residences are treated equally under the noise impact criteria.

O-003-008

This incorrect methodology masks the significant disproportionate adverse impacts to the HIMHC residents due to the more affluent residents living east of the bridge project.

- Through the public participation, HIMHC residents voiced their environmental justice concerns numerous times, including conducting their own residential survey in determining that approximately 50% of the 1,300 residents are low-income. If CRC was unable to identify the demographics of HIMHC at the block group level, CRC should have conducted a residential survey – similar to what they conducted in potentially impacted Vancouver communities and the small Janzten Beach Moorage community just to the south of HIMHC. Such an analysis reveals that HIMHC has a significant low-income population that qualifies as an environmental justice community, requiring more specific identification and analysis of disproportionate impacts and available alternatives and mitigation and more substantial public notice and participation.

- The FEIS fails to use the correct comparison population in conducting a demographic analysis of the HIMHC. CRC should use regional median household income data (i.e., City of Portland, Multnomah County or Portland Metro region) in comparing the median household income of HIMHC residents. Use of the federal poverty standard cannot adequately determine whether potentially impacted communities are low-income relative to non-impacted communities in the project area.

- The FEIS fails to use the most current and accurate income data in determining the median household income of HIMHC residents. At a minimum, CRC must use 2005-09 American Community Survey data, published in 2010. Due to the substantial concerns raised by HIMHC regarding environmental justice, CRC staff should have conducted a door-to-door residential survey to determine the most accurate household income data. The HIMHC is a discrete, compact community that can be easily surveyed, and does not therefore present an undue burden on the agency.

- By failing to conduct appropriate methodological studies of the HIMHC, CRC has failed to comply with Executive Order 12898, requiring each federal agency to identify and address "disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

- While CRC staff engaged in significant interaction with the HIMHC over the three years of project proposal development, the opportunities for meaningful public participation were in fact limited. CRC initially convened a Community and Environmental Justice Group (CEJG) comprised of community residents and representatives from both Vancouver and Portland communities, including residents of diverse economic backgrounds and ethnicities. While agency obtained a veneer of diversity, the CEJG was not given a basic environmental justice training until two years into the process and precluded CEJG discussion of environmental justice concerns, including specific impacts, mitigation measures and community benefit agreements. CRC disbanded the CEJG prior to release of the DEIS.

7

The Noise and Vibration Technical Report, an Appendix of the FEIS, contains a section that is specific to the potential noise related to construction. See Section 5.2, Construction Activities, and Section 6.3, Proposed Mitigation for Adverse Effects during Construction. The governing criteria for noise related to construction in the City of Portland can be found in City of Portland Municipal Code Title 18, Noise Control. Chapter 18.10.060 provides the criteria for construction noise. Under the City's noise control ordinance, virtually all major construction projects require a noise variance if work is planned during nighttime hours or on Sundays. Daytime construction activities are limited to 85 dBA at 50 feet with the exception of trucks (see Section 18.10.020), pile drivers, pavement breakers, scrapers, concrete saws, and rock drills.The contractor would be required to meet the City of Portland Municipal Code Title 18, Noise Control, if the contractor elects to use the site for a staging area. Additionally, the project will require a temporary noise wall be constructed to protect the Hayden Island Manufactured Home Community residents from noise at the Thunderbird staging area.

O-003-007

The FEIS contains a summary of the information obtained during preparation of the Hazardous Materials Technical Report. The Report does have some specific information and research regarding potential contaminants for identified sites. However, it is only for sites identified in regulatory databases, not every property within the corridor. The scope of an environmental impact statement in a large corridor does not include specific on-site investigation of hazardous materials on every single property. It generally looks at summary information for the entire corridor (i.e. regulatory database, aerial photos, Sanborns, and windshield survey) to provide an overview of potential issues and how that could impact the various alternatives. The FEIS recommends a Phase I/II environmental site assessment in any case of acquisition or property use. These site assessments will include different analyses to determine

H. PROJECT SCOPING AND ALTERNATIVES ANALYSIS

O-003-009

- The FEIS fails to analyze an adequate scope of project impacts due to a limited scope of review. The project purpose is unjustifiably limited to improving freight and traffic conditions along the I-5 freeway corridor, yet the north-south flow of traffic through the Portland-Vancouver metropolitan area is regional in nature, with an additional crossing along the I-205 freeway. By failing to consider regional alternatives, and therefore, regional impacts, the FEIS has insufficiently analyzed the ecological, health-based and cumulative impacts of the project.

- Due to the significant disproportionate impacts on a low-income population, Executive Order 12898 and NEPA require CRC to conduct an alternatives analysis that avoids, reduces or mitigates such impacts. The FEIS fails to consider alternatives including improvements to the downriver railroad bridge such that ships can navigate the high passage point of the existing Columbia River bridge, allowing for more modest development and avoiding the need to raise the draw bridge, which forces cars to idle and emit increased air toxics into the HIMHC.

8

the possible contaminants at each site. Contaminants may include asbestos in buildings, leaking underground storage tanks, and other toxics. Any identified toxics will be treated appropriately, in accordance with federal, state, and local regulations.

O-003-008

The demographic data presented for the Hayden Island Neighborhood in Chapter 3 (Section 3.5) of the DEIS was taken from the 2000 U.S. Census and cut to the neighborhood boundaries. The U.S. Census estimated a total of 2,071 residents on the Island, which is in-line with the population estimate of 2,155 residents conducted in 2007 by the City of Portland for the Hayden Island Planning process. In an effort to more accurately reflect the Island population, the FEIS assessment is based on data from the 2010 Census, the American Community Survey, and a project-specific survey of potentially displaced households. Updated population and demographic information can be found in Chapter 3 (Section 3.5) of the FEIS.

The displacement survey (which focused on the most directly impacted households) was undertaken in response to assertions that the Census data misrepresented the affected community. The project utilized the recommended methods for assessing area demographics. In order to better understand the potential disproportionality of impacts, the project went well beyond the standard methods. The displacement surveys were one of the specific ways in which the project assessed the potential disproportionality of the most direct impact a household can experience (a residential displacement). Unlike other populations in the study area, the Manufactured Home Community will not experience any residential displacements. The US Census data indicate that, as a whole, the Hayden Island neighborhood has a lower proportion of minority and low income households than in the City of Portland, Multnomah County, or in the Project study area. Hayden Island ranks near the lower end of the spectrum in both minority and low income household composition when

compared with all other neighborhoods in the study area. Households within the Hayden Island Manufactured Home Community were not surveyed; but these households also will not be displaced. The impacts to these households will result from dust, noise, traffic delays, and other effects during construction. Because many areas along the corridor will experience similar or more severe impacts from construction, there is very little potential for the impacts on Hayden Island to be determined as being disproportionately high and adverse.

The CRC recognizes that there are low income and minority households on Hayden Island. Any individual households, regardless of the demographics of the surrounding neighborhood, have and will be considered as EJ populations and covered by the Executive Order on Environmental Justice. The implementing federal and state guidelines on Environmental Justice have and will guide the project's consideration of, outreach to, and mitigation of impacts for these households.

Since the CRC is a DOT project, the DOT standard for low-income must be used. That standard is the federal poverty guidelines. But the project has gone beyond the use of just this standard and has, as you suggest, compared the neighborhood's demographics with those in the City, County, and study area.

O-003-009

The comment regarding regional alternatives, issues, and impacts is addressed in the responses to the letter from PEAC.

The project would not have disproportionately high and adverse impacts to minority or low income populations (see Section 3.5 of the FEIS).

Downriver railroad bridge improvements were considered and dropped prior to the Draft EIS.

October 24, 2011

Nancy Boyd
Executive Director
Columbia River Crossing
700 Washington Street, Suite 300
Vancouver, WA 98660

RE: CRC PROJECT COMMUNITY CONCERNS
FEIS COMMENT SESSION

Dear Nancy,

Thank you for coming to our recent Hayden Island Livability Project meeting.

The Hayden Island Manufactured Home Community (1300 people approximately) is largely in favor of the LPA. We live in the "traffic congestion zone", would like improvements in the highway system, and would enjoy light rail to the island.

Our Homeowners Association has a few concerns about the FEIS and the project in general.

Safeway / Full Grocery Store Loss

O-004-001
- Target will NOT be a total substitution for the loss of Safeway on the island
- Target has only marginal fresh meats and vegetables department
- The FEIS states that the addition of light rail will mitigate the loss of Safeway, this is not a logical argument as the people that 'need' Safeway the most will not be riding light rail to the next grocery store. This argument is false.

Arterial Bridge

O-004-002
- Needs to be moved up to the first stages of construction
- Will assure ease of getting to and from our homes during years of major road construction
- Will assure more availability of emergency responders for our aging community
- Needs to NOT be an 'option' in the FEIS

Air Pollution / Noise / Vibration / Utility Services Impacted By During Construction

O-004-003
- Manufactured homes are unique, do not have full foundations, and may not make it through the construction phasing, CRC needs to work with LauTrec to assist homeowners if problems occur

O-004-004
- Air / Noise impacts to community will be high during years of construction, specifics are needed on impacts, mitigation, respiratory clinic for local residents

O-004-005
- Utility Services will be greatly impacted locally, assurance is needed that seniors (many on life support machines) will not suffer needless because of disrupted services

Local Transportation Concerns

O-004-006
- Handicapped parking, "senior citizen" parking needs to be confirmed at light rail station, our community is not in "walking distance" to the station
- Island-wide shuttle during construction (to lessen local traffic) as well as after to get people to light rail needs to be guaranteed

O-004-001

The project has endeavored to avoid the displacement of any businesses, though it is not possible to do so within the densely developed corridor. The project will continue to look for ways in which impacts can be minimized and avoided. The displacement of Safeway is documented in the FEIS. Mitigation for this impact is governed by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. The project will suggest that Safeway relocate on Hayden Island, but cannot require them to relocate in any specific location. The eventual relocation will be a business decision by Safeway.

O-004-002

The local multimodal bridge is part of the Selected Alternative, and the project will consider and seek opportunities to build and open it during, rather than at the end of, overall project construction. However, limited construction funding could lead to some elements being built before others.

O-004-003

There will be monitoring for any structures at risk of being damaged by vibration construction. Damage is highly unlikely for the manufactured homes on Hayden Island.

O-004-004

The project does not plan to build a respiratory clinic but has committed to air and noise reduction mitigation during construction that can help minimize impacts.

O-004-005

The project team, through coordination with the utility owners and construction staging planning, will develop a Conceptual Utility Relocation Plan that indicates how utilities will be relocated, where they

O-004-007

Environmental Justice Community Recognition

- This community was not surveyed (like the Jantzen Beach Moorage), this community was hardly counted in the 2000 census, it's numbers were rolled together with the numbers from the wealthier side of the island, and this segued the island's numbers for the FEIS
- Our community IS an environmental justice community – many of our residents are living at or below the poverty line – we need protection, we are in the impact zone, we need special considerations
- Jobs need to be generated from this community – flaggers, etc.
- Enhancement fund needs to be guaranteed for use to mitigate the liabilities that this community (and Hayden Island as a whole) will bare for this project

Thank you for hearing our comments and concerns and relating them to the FEIS.

Signed,

Pamela Ferguson
President, Home Owners Association
HAYDEN ISLAND MANUFACTURED HOME COMMUNITY
2270 North Broughton Drive
Portland, OR 97217
503-265-9479
pamfergusonpdx@aim.com

and other community members .....

Print Name	Street Address	Signature
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Linda Caso	1501 N. Hayden Island Dr. #14B	Linda Caso
RUSS HOUGHTON	12241 N WESTSHORE DR	
DELBERT LOREE	1503 N. HAYDEN IS. D.R #247	
Roger STAVER	11638 N Island Cove Ln	
Richard T. Carhart	134 N. Tomahawk Island Dr.	
Brad Houton	Brad Houton - PDX -	
Victor Viets	421 N. Tomahawk Is. Dr., 97217	
Tom DANA	1501 N Hayden Island Dr #110	
Jason Botel	1501 N Hayden Island Dr #38	
MARY LEVINER	12462 N WESTSHORE DR	
LUCINDA KARLIC	1503 N. HAYDEN IS. DR #28	
STEFAN KARLIC	1503 N. HAYDEN IS. DR #28	
Esther Wright	2630 N. Hayden Isl. Dr. # 8	
Kathleen DORR	1503 N. Hayden Is. Dr. #249	
Cheryl K. Lund	Slip 17, 2630 N Hayden Island Dr.	
David Rothwell	1503 N Hayden IS DR #229	
Kimberly Wing	12730 N Seuler Ave, Portland, OR	
Mikale Wise	1501 N. Hayden Island	
Carla Heinila	1503 N. Hayden Island Dr.	
Dani Johnson	1503 N. Hayden Island	
Deborah L. Heckhausen	12890 N. Image Calroe Ave, Portland OR 97217	

will be relocated to, how much the relocation will cost, and who is responsible for the relocation (i.e., the DOT or the utility owner). This plan will also propose a schedule for when the utilities should be relocated in coordination with the construction to minimize any potential temporary impacts to utility services. The project team will also work closely with the utility owners to ensure that any temporary outages are communicated to their customers.

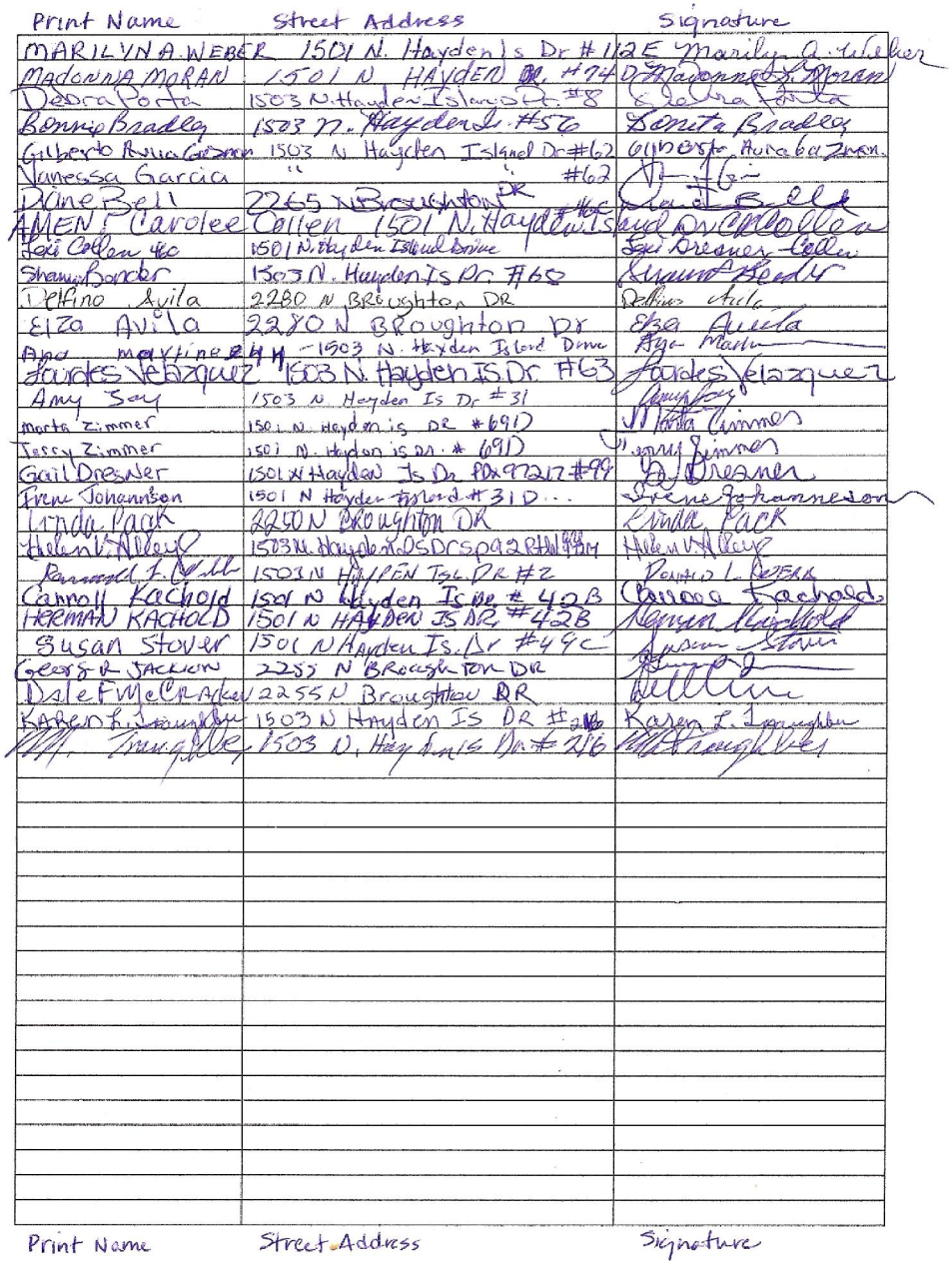
O-004-006

The Hayden Island LRT station cross-section illustrations in the FEIS show a conceptual design with placeholders for station elements. CRC is committed to working with the community to advance the station design. Station design work will take place during final design.

At the December 2010 Portland Working Group (PWG) meeting, TriMet representatives discussed bus service. TriMet will work closely with the contractors during CRC construction to ensure that Line 6 service continues to Hayden Island. When developing a bus service plan along a new light rail line, TriMet re-evaluates all bus service within the vicinity of the new line with the intention of maximizing ridership and limiting service duplications. As part of this process, TriMet conducts ridership, cost, and operational analyses.

The project will work with TriMet and the Hayden Island community to develop a bus service plan during construction and after light rail opens in 2019. Circulator service will be part of this program, though the details will not be finalized without more coordination with Island residents, businesses, and organizations.

On-street parking is shown in the current roadway designs for Tomahawk Island Drive. The project will work with the City of Portland and the Hayden Island community to refine the parking designations near the LRT station. Delta Park will serve as the nearest park and ride



Print Name	Street Address	Signature
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Diane Bell	2265 N Broughton DR #6	Diane Bell
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Amy Say	1503 N Hayden Is Dr #31	
marta Zimmer	1501 N. Hayden is DR #691	Marta Zimmer
Jessy Zimmer	1501 N. Hayden is DR. # 691	Jessy Zimmer
Gail Dresner	1501 N Hayden Is Dr PDX 97217 #99	Gail Dresner
Irene Johannson	1501 N Hayden Island #310	Irene Johannson
Linda Pack	2250 N BROUGHTON DR	Linda Pack
Helen V. Alley	1503 N. Hayden IS DR #59	Helen V. Alley
Pamela L. Bessey	1503 N HAYDEN ISL DR #2	Pamela L. Bessey
Carroll Kachold	1501 N Hayden Is Dr #42B	Carroll Kachold
HERMAN KACHOLD	1501 N HAYDEN IS DR #42B	Herman Kachold
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Dale F McCracken	2255 N Broughton DR	
Karen I. Broughton	1503 N Hayden IS DR #2	Karen I. Broughton
Tim Broughton	1503 N. Hayden Is Dr #216	Tim Broughton

disproportionately more severe than those experienced elsewhere in the project area.

However, the project recognizes that there are low income and minority households on Hayden Island. And the project will remain open to the potential for specific, vulnerable populations to be present in the HIMHC. The project has worked closely with the community on Hayden Island to identify unique impacts and develop mitigations for these. The implementing federal and state guidelines on Environmental Justice have and will continue to guide the project's consideration of, outreach to, and mitigation of impacts for these households.

The project will be working with the construction contractors to develop means by which local companies can participate in the project and, to the extent allowable by law, will encourage the hiring of local residents.

In the last three years the CRC project team, the Project Sponsors Council, and CRC advisory groups have focused on incorporating a wide range of community enhancements into the project. The project has looked for ways to leverage the highway and transit investments into additional improvements for project neighbors and local communities. These improvements are beyond the benefits identified as the project's purpose and need. These tangible improvements include new local roads, improved local flow, and improved connections for Hayden Island residents; better bike and pedestrian access to the improved facilities; new bike and pedestrian trails; and a separate bridge for local auto access from North Portland to Hayden Island. We know there is more to be done. The CRC remains committed to aggressively maximizing and leveraging resources to bring additional benefits and improvements to our community. Two options have been identified for further exploration; both include a financial set-aside of a specific amount dedicated to a specific purpose. One approach is a project-specific community enhancement fund. There is some history with such an approach - the

Delta Park 1-5 widening project (2006) and Metro's solid waste program (1991) are two examples. The other approach is a different concept, a regional fund established by the state to benefit the neighborhoods and communities in close proximity to 1-5 and the CRC project. Both approaches have been successfully implemented in the Portland region and will help inform this effort. We need to be clear about both of these approaches - neither will be easy. Both approaches have limitations and legal restrictions associated with anticipated funding sources. Both will require legislative support. Both will likely need enabling legislation, and both will require funding.

Hines, Maurice

From: Mike Connors [MikeConnors@hkcllp.com]
Sent: Monday, October 24, 2011 3:39 PM
To: Columbia River Crossing
Cc: Dawn Fulps
Subject: CRC FEIS Comment letter
Attachments: Hayden Island.pdf

O-005-001 I represent Hayden Island Enterprises, the owners and operators of the Hayden Island Manufactured Home Community located on Hayden Island. I am submitting the attached FEIS comment letter on behalf of my client. Thanks, Mike

E. Michael Connors
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O-005-001

Thank you for your comments, which are addressed below.

Hathaway Koback Connors LLP

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October 24, 2011

VIA EMAIL & U.S. MAIL

Columbia River Crossing
c/o Heather Wills
700 Washington Street, Suite 300
Vancouver, WA 98660

Re: Comments on FEIS for CRC project
Hayden Island Manufactured Home Community

To whom it may concern:

O-005-001 This firm represents Hayden Island Enterprises, the owners and operators of the Hayden Island Manufactured Home Community (the "Community"). The Community consists of 440 manufactured home sites, 169 RV sites and a total of approximately 1,500 residents located on East Hayden Island. Hayden Island Enterprises is submitting the following comments on the Final Environmental Impact Statement ("FEIS") for the I-5 Columbia River Crossing ("CRC") project. We spoke with representatives of the Community Homeowners Association about the FEIS and it is apparent that the residents share many of our views and concerns. We request that you forward our comments to the Federal Highway Administration ("FHWA") and Federal Transit Administration ("FTA") as part of their consideration of the FEIS.

1. **LPA Option A – local multimodal bridge.**

O-005-002 Hayden Island Enterprises strongly urges the FHWA and FTA to select LPA Option A because it is the only viable option. The Integrated Project Staff and the Project Sponsors Council recommend LPA Option A after an extensive public process. Hayden Island Enterprises, the Community residents and the public in general overwhelmingly favor LPA Option A. LPA Option B has not been sufficiently vetted or evaluated, and therefore LPA Option B should be removed altogether.

The LPA Option A proposal to include a local multimodal bridge over North Portland Harbor is particularly important to the Community. It is imperative that the CRC project include a local multimodal bridge so that residents are not limited to using the I-5 freeway ramps for access on and off the island. It is also imperative that the local multimodal bridge be built as part of the initial construction phase and not deferred until the later phases of the project. The need for the local multimodal bridge will be even more important during the I-5 bridge construction.

O-005-002

The project is eager to work with emergency service and utility providers as the design for the LPA and the approach to construction is further refined. The project has already made commitments to maintaining three through lanes, and to construction-period transit enhancements. The possibility of early construction of the local multimodal bridge will continue to be a consideration by the project as project sequencing is refined. It is also discussed in Chapter 2 of the FEIS, (Section 2.3.1), but not as mitigation. Although it is not appropriate to describe the early construction as mitigation, it is discussed as something we will explore as we further refine construction staging. Specifically Section 2.3.1 of the FEIS states:

> Similarly, the Marine Drive interchange construction would need to be coordinated with construction of the southbound lanes coming from Vancouver. While this interchange can be constructed independently from the work described above, the completion and utilization of the ramp system between Hayden Island and Marine Drive requires the work to occur in the same period. Early construction of the local multimodal bridge between Marine Drive and Hayden Island, so that it can be used as an alternate access route during the remaining construction period, will be analyzed during final design. The interchange reconstruction also needs to occur so that Marine Drive can be elevated, allowing the light rail extension to cross under Marine Drive. The Marine Drive interchange is expected to take a little more than 3 years to construct, including work at the Victory Boulevard interchange.

2. N. Hayden Island Drive intersection improvement.

O-005-003 Based on our review of the FEIS and conversations with CRC staff at the October 13th drop-in session, it is our understanding that the FEIS proposes to improve the intersection of N. Hayden Island Drive and B Street as a staggered signalized intersection. This intersection design is substantially the same as Concept 4.02 from ODOT's 2009 draft I-5: Hayden Island Interchange Are Management Plan (IAMP).

Hayden Island Enterprises strongly supports this intersection improvement proposal because it is the only proposal considered thus far that maintains the Community's eastern access. This option maintains the Community's existing access and improves the intersection operations and safety. Other options considered by ODOT require the removal of manufactured homes and/or relocation of the access to an area that is not acceptable to Hayden Island Enterprises. This is an extremely important issue for Hayden Island Enterprises and we strongly encourage the specific adoption of this proposed improvement as a necessary mitigation for the CRC project.

3. Use of the adjacent Thunderbird Hotel site.

O-005-004 The vacant Thunderbird Hotel site should not be used for major construction staging because it is adjacent to the Community and will cause substantial impacts to its residents. The FEIS proposes to use the Thunderbird hotel site for major construction staging, but acknowledges that it will exceed acceptable noise levels within the Community and that there is insufficient mitigation proposed. The FEIS provides:

> "The western boundary of the Thunderbird Hotel Site is within 50 feet of the adjacent Hayden Island manufactured home community. Depending on the scheduling of staging activities, the particular equipment used, and the location of the activities on the staging site, the DEQ Noise Source Standards could be exceeded at locations within the adjacent neighborhood. If this site is selected for project staging activities, additional construction noise monitoring and mitigation measures, beyond those discussed in Section 3.11.5, could be required." FEIS, Chapter 3.11, p. 3-303.

The Thunderbird Hotel site cannot be used for major construction staging if it will exceed acceptable noise levels within the Community and adequate mitigation has not been proposed.

If the CRC project insists on using the Thunderbird Hotel site, additional mitigation must be provided. The use of this adjacent site will have substantial noise, vibration, visual and dust related impacts on the residents of the Community. In addition to the construction–related mitigation proposed in Section 3.11.5 of the FEIS, the CRC project should limit the type of construction activity on this site to low impact activities, provide noise and visual mitigation walls and screening, and provide large buffers between the construction activity and the Community.

O-005-003

Thank you for your comments. We will work closely with the community as the designs for the Island are refined.

O-005-004

There are five possible staging areas identified in the FEIS. These staging areas could be used by a contractor, or they may choose their own. This is typical during the planning and NEPA environmental impact assessment stage.

A contractor will determine the exact activities that will occur on any of these sites, or any other site to be used for staging or casting. The contractor, working closely with the DOTs, will need to identify potential impacts and appropriate mitigation, in accordance with applicable federal, state and local regulations.

The project has committed to the following mitigation measures as described on pages 3-283 to 3-285 of the FEIS:

- Control dust and exhaust emissions from demolition and construction activities.
- Require contractors to comply with State of Oregon's standard specifications (Section 290) for dust, diesel vehicles, and burning activities.
- Follow State of Oregon's specifications for truck staging areas for diesel-powered vehicles.
- Use ultra low sulfur diesel for diesel construction vehicles and equipment, or otherwise comply with any new, more stringent regulations in place at the time of construction.
- Pursue emerging technologies for cleaner construction emissions, like the use of diesel scrubbers for compatible equipment, and continue to encourage and require those types of technologies as bidding laws allow.

4. The FEIS is inconsistent with the Hayden Island Concept Plan.

O-005-005 The City of Portland recently adopted the Hayden Island Concept Plan to plan for the future growth and development of Hayden Island after an extensive public process. The Hayden Island Concept Plan provides for a self-sustaining community consisting of mixed-use residential and retail commercial developments with an integrated transportation network that provides better connectivity on the island for vehicles, bicycles and pedestrians.

Although the FEIS claims that the final design will be consistent with the Hayden Island Concept Plan, it is in fact inconsistent with the Hayden Island Concept Plan in several regards. The CRC project will effectively split Hayden Island in two and it fails to address the lack of adequate east-west connections. This will be particularly problematic during the construction phase which will last for several years. The FEIS does not adequately address this issue or offer mitigation to maintain the connectivity on Hayden Island.

The CRC project will eliminate numerous commercial retail businesses on the island, including the Safeway, the Chevron station, the car wash, restaurants and the Wells Fargo Bank. Safeway is the only major grocery and pharmacy option, Chevron is the only gas station on Hayden Island and the Wells Fargo Bank is one of only two banks on the island. The proposed stormwater treatment wetlands will occupy the entire site of the future local retail center shown on the Hayden Island Concept Plan. Removing these important retail businesses will force island residents to travel off Hayden Island to obtain basic retail items, which is wholly inconsistent with the Hayden Island Concept Plan's fundamental goal of creating a connected and self-sustaining community on the island. Although mitigation is offered to the business owners who will be displaced, no mitigation is offered to island residents who will lose a large percentage of their local service businesses. The FEIS fails to address this impact or propose adequate mitigation.

The Hayden Island Concept Plan provides for future waterfront park areas under the CRC landings that are not discussed in the FEIS. It is important that right-of-way lands under the landings of the existing and new bridges be made available for shoreline access and park use. The failure to provide public access is not identified as an impact on the community and is in violation of the Hayden Island Concept Plan.

5. Air, noise and vibration impacts.

O-005-006 Hayden Island Enterprises does not believe the FEIS adequately evaluated and proposed mitigation for construction related air, noise and vibration impacts. The CRC project will impact Hayden Island more than any other stretch of the project. The CRC project should be required to provide a baseline air quality test (as opposed to modeling) and air quality monitoring equipment to monitor air quality during construction. Additional noise and vibration mitigation should be

O-005-007 provided. Hayden Island is more susceptible to noise and vibration impacts due to the soils and geography. Several residents have commented that recent construction activity on the island has had significant noise and vibration impacts even though this construction activity is much smaller in scale than the CRC project. Therefore, noise and vibration mitigation beyond those measures typically provided for such a project should be provided for Hayden Island.

- Require stationary sources, such as concrete mix and asphalt plants, to obtain an Air Contaminant Discharge Permit from either DEQ or SWCAA and to comply with regulations for controlling dust and other pollutant emissions.
- Manage construction materials and activities to minimize dust, glare and smoke.

The Noise and Vibration Technical Report, an Appendix of the FEIS, contains a section that is specific to the potential noise related to construction. See Section 5.2, Construction Activities, and Section 6.3, Proposed Mitigation for Adverse Effects during Construction. The governing criteria for noise related to construction in the City of Portland can be found in City of Portland Municipal Code Title 18, Noise Control. Chapter 18.10.060 provides the criteria for construction noise. Under the City's noise control ordinance, virtually all major construction projects require a noise variance if work is planned during nighttime hours or on Sundays. The contractor would be required to meet the City of Portland Municipal Code Title 18, Noise Control, if the contractor elects to use the site for a staging area.

O-005-005

The project's commitment to construct Tomahawk Island Drive, as identified in the Hayden Island Plan will substantially improve east-west connections on the island. Other improvements will result from reduced congestion and the significant improvement to be made to sidewalks.

Yes refinements and new information resulted in additional displacements. We do not expect that all the businesses assumed to be displaced will necessarily have to be displaced, but it is prudent to be conservative about impacts in the NEPA process. Also, some of the displacements would be affected only by diminished access, not by demolition. It is possible that some of these properties and buildings could be re-occupied by other businesses that would not be so affected

6. Sound reducing walls along Hayden Island stretch of I-5 freeway.

O-005-007 The CRC project should include sound reducing walls along the section of I-5 that goes over Hayden Island. The FEIS proposes sound reducing walls along several sections of I-5, but not the section that goes over Hayden Island. This section of I-5 will be in close proximity to the Community and several other residences. The CRC project should provide additional noise mitigation to minimize the noise impacts to these residents.

We appreciate your consideration of our comments and request that these proposals be incorporated into the final design of the CRC project.

Very truly yours,

HATHAWAY KOBACK CONNORS LLP

E. Michael Connors

EMC/df

Cc: Hayden Island Enterprises

by the revisions in access.

The transfer of 0.4 acre of surplus land to the City of Vancouver is mitigation for the project's direct impact on the City's existing Waterfront Park, an existing public park and a Section 4(f) resource. The project has no impact to public parks on Hayden Island and therefore no need for such mitigation. The CRC project does not currently propose to convert the existing Thunderbird site on Hayden Island into a public park, but it also does not preclude it from becoming a public park in the future. Decisions regarding the disposal of surplus property after project construction will be made at a later date.

O-005-006

The project has committed to the construction air quality mitigation measures described in response to comment O-005-004.

O-005-007

The Noise and Vibration Technical Report, an Appendix of the FEIS, contains a section that is specific to the potential noise related to construction. See Section 5.2, Construction Activities, and Section 6.3, Proposed Mitigation for Adverse Effects during Construction. Also, the governing criteria for noise related to construction in the City of Portland can be found in City of Portland Municipal Code Title 18, Noise Control. Chapter 18.10.060 provides the criteria for construction noise.

Section 5.2.2 and Section 6.3.2 of the Noise and Vibration Technical Report provide a section on construction vibration. Although there are no state or federal regulations related to construction vibration, the contract specification will have a section that would likely limit the contractor to a maximum vibration level. The majority of major vibration-producing activities will be more than 300 feet from the nearest home on the Island. Therefore, it is unlikely that vibration levels at that distance will be of sufficient magnitude to result in any structural issues, even for the

manufactured homes.

However, the project also will work to avoid and minimize any vibration which would adversely affect the quality of life for Island residents. The project will work with contractors, especially in regards to activities at the Thunderbird Staging area, to minimize the vibration impacts for residents. Further analysis and vibration monitoring will be completed, and these analyses will take into consideration the specific soil structure of different areas.

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O-006-001

List of Mitigations for Hayden Island Businesses

1) Volunteer representatives from the residential and business communities need to co-create the Hayden Island construction project plan with the Columbia River Crossing, (CRC) Engineers, Right of Way experts, TriMet, ODOT, and other agencies involved in the bridge project before construction begins, and throughout the length of the project.

2) Once construction begins, the selected representatives from the business/residential communities will oversee the construction plan, be the point of contact between CRC Engineers, other planning agencies, and the residents/businesses on Hayden Island.

Financial Assistance for businesses on the island including but not limited to funding the following:

3) Re-branding consultative and social media services to re-brand the island as a destination location.

4) Short term business loans (2-3 yrs), guaranteed by the City or State, that would replace the current financing, and/or assist businesses throughout the CRC project and rebuilding of Hayden Island.

5) Financial compensation to businesses no longer able to attract customers due to the loss of economic viability of Hayden Island because of the current and anticipated increase in heavy traffic congestion, and access problems.

6) An assistance program in the form of a redevelopment loan or grant, to help fund business operations until bridge plans become certain and economic viability returns.

7) A marketing grant to help spread the news about the Hayden Island business community, Hayden Island's area attractions, and livability.

8) Bridge authorities and government agencies should recommend and frequent local businesses, rent or purchase properties on Hayden Island during the project.

9) Eminent domain condemnation of Hayden Island businesses should be a serious consideration by federal government, the State of Oregon, and/or the City of Portland, given that their planning indecision and funding uncertainties have been a significant contributor to the negative economic climate on Hayden Island for businesses and property owners.

10) Website with construction updates, CRC and related agencies contact information, construction/planning schedule, project timelines; overview of CRC, and current Hayden Island Plan.

11) Hayden Island Visitors Center located on the island.

This list of mitigations is not the final and official word from businesses on the island.
Presented to Columbia River Crossing on 10/20/11

Page 1of 2

O-006-001

Thank you for the constructive suggestions. While some of these measures are likely not feasible, many of them are possible and will be included in discussions with Hayden Island business owners as a detailed plan for supporting businesses during construction is developed. Please see the response to comment letter N-003.

List of Mitigations for Hayden Island Businesses

O-006-001

12) A hotline for people to call about CRC construction, theft, vandalism, an accident, or if there is a problem associated with the construction.

13) Financial Assistance to attract new businesses to Hayden Island before and during construction.

14) Early construction of the Hayden Island local arterial bridge to ease traffic bottlenecks on/off the island during construction.

15) Create reliable transportation during the construction.

16) Ensure traffic can enter and exit the island with ease.

17) Enhanced security services for vacant residential and business properties. More police presence on the West & East sides of Hayden Island.

18) A satellite police station needs to be placed in a visible location on Hayden Island with routine daily and nightly island patrols!

19) Home and business inspections before and after construction for any possible damages caused by construction vibrations especially for those that are closer to the staging areas and river.

20) Additional streetlights need to be added to ensure safety at night for pedestrians and motorists. Especially on the newly created "main street" of town.

21) City/State/Federal Government need to supply a large billboard alerting drivers on I-5 South and I-5 North that "Businesses Are Open." Also, small signs strategically located throughout Hayden Island and on the West and East sides of the Island for pedestrians, bike riders and slow moving motorists.

22) The Island Community made up of residents and businesses expects support from the City, State, Federal Government, Portland Development Commission; Metro, Business Oregon, Venture Portland, TriMet, and other governing agencies to financially assist in ways to attract more business to the island.

This list of mitigations is not the final and official word from businesses on the island.
Presented to Columbia River Crossing on 10/20/11

Hines, Maurice

From: Columbia River Crossing
Sent: Monday, October 24, 2011 4:10 PM
To: Columbia River Crossing
Subject: FW: Meeting with Perkins /Coie LLP

From: Gray, Joe
Sent: Monday, October 10, 2011 3:03 PM
To: document.control
Cc: Pressentin, Anne; Palazzo, Mike
Subject: Meeting with Perkins /Coie LLP

Date: 10/10/2011
Time: 10:00am – 11:10am
Location: Offices of Perkins / Coie LLP
Attendees: Steve English, Stephen Pfeiffer and two owners of Buena – Hayden LLC (Did not get the Names of the owners)

B-001-001 Met with the above listed at the Attorneys office of Perkins / Coie LLP today. The meeting was about the potential impacts to the Buena-Hayden properties due to the CRC project. I was asked many different questions about the project and funding related to it. I let them know that the FEIS information was up to date and that was what we were using to identify properties that maybe impacted by the project. The attorneys wanted to know how much money was being spend monthly on the project and I told them that I did not have that information. I was also asked about how many people were employed at the CRC office and I told them I was not sure, but around 40-50 and that changes based on the work needs. The main reason for the meeting was to see when and how much we were going to pay the owners (Buena – Hayden LLC for their property and when were we going to do that. I explained that we were not purchasing any R/W at this time and we were not moving forward with R/W tell after ROD and if we had funding to move forward.

They asked if we would be will to buy the vacant property (Newport Bay) now before they have a new owner or lease it out. They say there is plans to have Denny's move to that location and on the Denny's site place a new Starbucks there. Also they told me that they feel they are Damaged due to the project taking so long. They feel that their properties are not selling or can sell because of the project and no one is will to purchase then have to move due to the project. This has created a hardship for the LLC and the CRC project caused this. The Attorney (Steven English) asked if we were willing to lease or buy the Newport Bay property at this time. I explained the process of this and that I could not answer this at this time, because I needed to know if the project had funding for this type of process. Mr. English told me that they are going to put a proposal to me and want a response quickly on the properties in question. Mr. English stated that he would not like to take action against us, but he feels his clients are damaged and wants to come up with a resolution that helps all of us. I told him to put the proposal together and get it to me and we would look it over and get back to them.

Joseph A. Gray
Right -of- Way Manager
Columbia River Crossing
office: (360) 816-2171
Cell: (360) 601-8991

B-001-001

This comment is a summary of a meeting between the ODOT right-of-way manager and impacted property owners and their representatives. The property owners' concerns will be resolved through the right-of-way acquisitions process, which will meet the requirements of the Uniform Act. Information about expenditures is available by contacting the project office.

DIVERSIFIED MARINE INCORPORATED DMI

P.O. Box 83719 Portland, OR 97283-0719
(503) 289-2669 / FAX 289-2825

October 24, 2011

Columbia River Crossing Project
700 Washington Street, Suite 300
Vancouver, WA 98660

RE: Comment by DMI in response to the FEIS

Dear CRC:

B-002-001

I am a planner representing Diversified Marine, Inc. ("DMI") at 1801 N. Marine Drive, Portland. I am writing to respond to the Final Environmental Impact Statement (FEIS) issued on September 24, 2011.

1. Section 3 of the FEIS states:

> *The information presented in this section [Section 3.3 – Property Acquisitions and Displacements] is based on the analysis described in the CRC Acquisitions Technical Report, included as an electronic appendix to this FEIS.* (p. 3-79)

DMI objected to the Acquisitions Technical Report in our June 23, 2008 letter to the CRC, which is included in the DEIS as comment item number B-059. We continue to make those objections to the Acquisitions Technical Report, because the information in the FEIS does not resolve them.

B-002-002

2. The discussion of information about the North Portland Harbor gathered since the DEIS was published (pp. 3-81 to 3-82) does not include any new information about DMI or other uses on the south side of harbor. It addresses only the floating homes on the north side of the harbor.

However Exhibit 3.3-3 (Figure I, p. 3-86) shows what appears to be acquisition of at least an easement at the east end of the DMI site, with consequential significant impacts to the existing DMI office building. And Exhibit 3.3-4 (Figure F, p. 3-87) shows that the project footprint will include land owned by ODOT and leased to DMI that is critical to parking and storage needs of DMI. Acquisition of ODOT-owned property is discussed in a sidebar on p. 3-90. But its significance to DMI is not considered expressly in the FEIS.

B-002-001

The Acquisitions Technical Report has been updated for the Final Environmental Impact Statement. Please see B-002-002 through B-002-010 below for responses to Mr. Epstein's specific concerns.

B-002-002

The pages you reference (3-81 to 3-82 of the FEIS) are under the header "Existing Conditions" and describe the existing conditions in the project area specific to North Portland Harbor, and are not under the header "New Information Developed Since the Draft EIS."

Exhibit 3.3-3 (Figure I, p. 3-86) illustrates a permanent property easement on the DMI site. This subsurface easement would likely cause the displacement of one structure on the property, as identified in Appendix E "List of Potential Property Acquisitions" on page E-30.

DOT-owned property is intended for transportation-related uses in the long-term, with which the CRC project is compatible.

Representatives of ODOT will work with DMI during the real estate acquisition process to ensure that fair market value compensation will be provided, in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended).

B-002-003

3. There is discussion of permanent subsurface easements for soil stabilization near the Marine Drive interchange. (p. 3-88). Although not discussed there in detail, we understand from discussions with CRC and PDOT staff that soil stabilization is likely to require removal of the existing DMI office building on the east end of our property.

At p. 3-90, the FEIS states that, "[p]roperty used temporarily during construction could be returned to its owner once construction is complete." Reconstruction or replacement of that office in its existing location may not be feasible, because the office now is situated on the harbor dike where the Soil and Water Conservation District would not allow its reconstruction or replacement. This issue is not addressed in the FEIS.

B-002-004

4. At p. 3-93 through 3-95, the FEIS discusses compensation and relocation for permanent property impacts consistent with the federal Uniform Relocation and Real Property Acquisitions Policies Act of 1970. However as pointed out in comment item code B-059, we understand from our lawyers (who are experienced in such matters), that DMI will not be compensated for the following:

(a) The loss of its leased storage and staging yard and off-street parking;
(b) Lost income during the move to and refitting of another site;
(c) The cost of in-water facilities that would have to be abandoned and rebuilt elsewhere;
(d) Disruption to and loss of work during the move;
(e) The cost to obtain permits at the new site; or
(f) The loss of the key technical personnel and physical and proximity relationships on which the business depends.

Although the FEIS discusses compensation for impacts to businesses in the North Portland Harbor, such as DMI, it does not discuss these uncompensated impacts.

B-002-005

5. Section 3 of the FEIS states:

In the Marine Drive interchange area, five marine-related businesses with a total of 25 employees and $10.6 million in annual sales would be displaced under the LPA. These businesses are dependent upon a location close to the river in order to operate. Finding suitable locations for boat sales and a boat dock and repair may be difficult, as much of the Columbia River area in the vicinity of highway access is built up for either residential or industrial/ commercial use. The Oregon Department of Transportation (ODOT) would partner with TriMet to provide relocation assistance to these businesses. (p. 3-107)

All displaced businesses would be offered relocation assistance in accordance with the Uniform Act. Some of these displaced businesses may choose not to relocate locally. Even with relocation assistance, some of the employees may be unable to retain their jobs; for example, an employee may have to accept a new job during the transition period of relocation. (p. 3-107)

B-002-003

As mentioned in the response to B-002-002, a subsurface easement would likely cause the displacement of one structure on the property, which you refer to as the DMI office building.

This easement is designated a permanent easement not a temporary construction easement, therefore, the statement about property temporarily used during construction is not applicable.

With regard to the possibility of reconstructing or replacing the office in the existing location, the FEIS disclosed the impact that a structure would be displaced on the property. Whether or not the structure could be rebuilt in its existing location, or on the property at all, is outside the scope of the NEPA process and would be addressed in the right-of-way acquisition negotiation process.

B-002-004

The FEIS states on page 3-93 "Where property acquisition and residential or business displacements are unavoidable, the project would provide compensation and relocation assistance." These compensation and relocation assistance measures would comply with the Uniform Relocation and Real Property Acquisitions Policy Act of 1970 (as amended) and any other applicable federal and state regulations.
Mr. Epstein's comment assumes that Diversified Marine will be displaced;however, it is not expected that Diversified Marine would be displaced by the CRC project improvements. Additionally, for displaced businesses, the FEIS does not specifically state the compensation provided to each displaced business, as this is something that is negotiated following an appraisal and during the property acquisition and business relocation process.

B-002-005

Please see response to B-002-004.

B-002-005 As noted above, the FEIS does not discuss uncompensated impacts and does not adequately assess the significance of the loss of DMI if its office building cannot be relocated or replaced and/or if DMI cannot obtain ample vehicle parking and storage and staging areas proximate to the shipyard.

B-002-006 6. Exhibit 3-4.6 at P. 3-110 identifies parking impacts of the project. It does not list loss of parking for DMI now situated on land leased from ODOT. This are a temporary and permanent effects that are not discussed in the FEIS.

B-002-007 7. Section 3 of the FEIS states:

> *Construction activity for the LPA would temporarily disrupt land uses on Hayden Island, but would not likely have as much of an effect elsewhere in the project area...* (p. 3-119)

This statement is incorrect. Construction activity associated with the LPA in general and with the LRT and Hayden Island collector bridge in particular will disrupt operations at DMI in at least three ways: (a) temporary (and perhaps) permanent loss of the DMI office building; (b) loss of parking for DMI and (c) loss of storage and staging areas on land leased from ODOT.

B-002-008 8. In the discussion of long-term effects, Sections 3 and 6 of the FEIS states:

> *Most negative economic impacts would result from business displacements, losses in parking, or changes in access to businesses. For those businesses displaced by the project, the acquiring agencies would provide a relocation assistance program. Property acquisitions affecting other uses would also be mitigated by relocation assistance, as described in Section 3.3, Property Acquisitions and Displacements.* (p. 3-120)

> *Property owners would receive just compensation for the estimated value of land and improvements acquired and for other impacts that result in a measurable loss of value to the remaining property. Just compensation would also be provided for displacement of personal property, including situations where there is a displacement of personal property that is not owned by the property owner or tenant (known as personal property only relocations).* (p. 6-17)

As noted above and below, the FEIS does not address uncompensated impacts and the potential loss of DMI due to the inability to restore the DMI office building and to replace leased parking, storage and staging areas lost due to the project.

B-002-009 9. *Actions Taken in Response to DEIS* (pp. 6-33, *et seq.*) does not address impacts to DMI.

B-002-010 10. DMI appreciates the responses in the FEIS to the comments by and on behalf of DMI. See item codes B-019, B-026, B-038 and B-059. Our concerns have been consistent since we became involved with the project in 2007.

B-002-006

The Economics Technical Report (pages 4-3 to 4-4) describes the parking impact to the ODOT property that is leased to DMI.

B-002-007

The section you reference describes temporary effects to land use and economics from the LPA. Temporary effects from construction are defined as effects that would end when construction ends. The three impacts that you list are permanent impacts. Impact (a) is addressed in Chapter 3--Section 3.3 Property Acquisitions and Displacements. Impacts (b) and (c) are addressed in the Economics Technical Report (as referred to in the response to B-002-006).

B-002-008

Please see response to comment B-002-004.

B-002-009

You are correct. Chapter 6 is about public input on the Draft EIS, and does not discuss all the impacts that are addressed in Chapter 3 or in the technical reports (such as the Acquisitions Technical Report).

B-002-010

As stated in Mr. Epstein's letter, DOTs and TriMet staff will continue to work with DMI and its representatives as the CRC project moves along in the design process.

With the information gained from ongoing discussions with DMI representatives, it has been determined that DMI is not expected to be displaced. As the project design advances and as discussions with DMI continue, the DOTs and TriMet staff will work with DMI to determine fair market value compensation for any losses incurred.

B-002-010

We also appreciate and acknowledge that staff from the CRC, ODOT and PDOT have met one-on-one with DMI, toured our facility and modified the recommended LRT and Hyden Island collector bridge alignment so that it does not split our parcel in two.

We also understand that some of the discussion and analysis in the DEIS and FEIS is necessarily of a nature that does not allow for the sort of finer-scale analysis at which the specific impacts to DMI's site and operations are timely and appropriate.

But we would be remiss if we did not point out those impacts now so that, as project planning becomes more detailed, our concerns will be addressed. We welcome continuing contact and coordination with the project staff and officials to this end.

Also we respectfully disagree with some of the responses to our comments, as noted elsewhere in this letter and below. We hope to persuade you to endorse and support our positions and to respond more fully to our needs as the project continues.

In several responses to our comments, the FEIS states, "it is not expected that Diversified Marine would be displaced by the CRC project." As noted above we appreciate that the project has shifted the LRT and island collector bridge alignment so that it does not split our ownership in two. That preserves in one piece the parcel owned by DMI.



But as noted in prior testimony and in our comments in response to the DEIS and shown on the left, the property owned by DMI for the shipyard is only about ¾ of an acre. Additional land critical to the business operations is leased from ODSL in the Portland Harbor. As importantly, DMI leases from ODOT an additional 2+ acres of upland area between the shipyard and Marine Drive. DMI uses this leased land for vehicle parking and for storage and staging of equipment and supplies. Without this land or a roughly equivalent area with convenient access to the shipyard, DMI cannot operate. Nowhere does the FEIS address this. We also believe that the Uniform Relocation and Real Property Acquisitions Policies Act of 1970 does not provide adequate if any compensation for such impacts.

We cannot emphasize enough that, to survive, DMI must have land proximate to the shipyard in which to park vehicles and to store and stage equipment and supplies. We appreciate that CRC, ODOT and PDOT staff are aware of this need from ongoing discussions. But this issue is not resolved yet. We hope that it can be resolved in the future. If it is not resolved, the CRC project will displace DMI.

B-002-010 As we have noted elsewhere in our testimony regarding the project, there is no place else where DMI can relocated. If it is displaced, DMI will be out of business. The result of this would be the loss of $10± million in income to the region and 50± family-wage earning jobs.

Thank you for considering our concerns.

Sincerely,

On Behalf of Diversified Marine, Inc.
Larry Epstein, JD, FAICP
9930 SW Quail Post Road
Portland, OR 97219-6367
503-317-3182
lepc@comcast.net

Hines, Maurice

From: Gill Wallis [gwallis@walliseng.net]
Sent: Monday, October 24, 2011 8:37 AM
To: Columbia River Crossing
Subject: Comment letter on Final EIS
Attachments: Historic Lucky Lager WarehouseBldg Comment Letter to CRC FEIS.pdf

Please find attached my comment letter on the CRC project Final EIS. I will also be delivering a hard copy to the Vancouver office.

You can reach me at 360-600-7094 if you have any questions.

Ms. Gillian Wallis
Mobile: 360.600.7094

HISTORIC LUCKY LAGER WAREHOUSE

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***



October 22, 2011

Columbia River Crossing
700 Washington Street, Suite 300
Vancouver, WA 98660

RE: Final Environmental Impact Statement Comment Letter
Columbia River Crossing Project

To Whom It May Concern:

B-003-001 I am writing to submit comments to the Final EIS for the referenced project and ask that the Record of Decision (ROD) include a statement that postpones acquisition of the property upon which the Historic Lucky Lager Warehouse Building is located until such time as the Locally Preferred Alternative (LPA) for the Columbia Street Park and Ride facility (referred to herein as the CPnR) is re-evaluated.

The lack of any evaluation and public input into this alternative points to a wider policy issue regarding local input into the impacts of the CRC project. Because the design is still in the conceptual stage, it is likely that small changes in final design could change impacts to properties as it is finalized. It appears reasonable to request that the Record of Decision for this project provide enough flexibility so that minor changes can be made to minimize impacts as the project moves through final design, and that properties are not acquired where there is the possibility of those changes.

I am making this request because I believe the CRC process by which the LPA for the Columbia Street Park and Ride facility was chosen violated NEPA. Those NEPA process deficiencies are shown graphically in Attachment A and summarized in Attachment B. They include:

- The LPA for the CPnR was selected without ample public input, particularly as related to the impacts to the Historic Lucky Lager Warehouse Building. In fact, at a public meeting whose sole purpose was to get input upon the CPnR alternatives, in response to a question about the Lucky Lager building, CRC staff falsely stated that the building site would be acquired regardless of CPnR options selected.
- The limited amount of public input obtained for the CPnR was ignored in the decision making process and blatantly suppressed from public record, including that in the FEIS.
- In evaluating alternatives for the CPnR, the EIS process failed to complete an economic and land use analysis of alternative sites.
- The decision making process for the CPnR failed to adequately address historic impacts. That process clearly violated Washington State's SEPA.

The LPA for the Columbia Street Park and Ride facility would likely not have been selected if the FEIS did not include a number of key factual errors which I have summarized in Attachment C. These are:

- The FEIS erroneously states that alternative locations for the CPnR were evaluated in the DEIS. Only one location was mentioned in the DEIS.

215 W. 4TH STREET, SUITE 200 VANCOUVER, WA 98660 ▪ 360.600.7094

B-003-001

The process that resulted in the Lucky Lager Warehouse being identified as an anticipated acquisition was part of ongoing work between CRC, the City of Vancouver, and C-TRAN. Decisions around the Columbia Park and Ride location and the roundabout at the southwest corner of the block were part of a collaborative process similar to decision-making and design development for the rest of the project. The project development process is dynamic and includes making assumptions, gathering additional information, and sometimes changing designs or assumptions based on new information or analysis. The project will continue to attempt to minimize or avoid impacts to properties, including the Lucky Lager Warehouse. For displacements that are unavoidable, the Washington State Department of Transportation would provide relocation assistance to businesses in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act. The CRC undertook a study called the Lower Vancouver Urban Design Study with the City of Vancouver, C-TRAN, and the public. The major components of this study included vehicle circulation, development opportunities and mixed-uses, pedestrian access and safety, and urban design. Expansion of the park and ride footprint resulted from an analysis of the number of spaces required at this location and the height of the structure as compared to footprint. Four options were explored that resulted in structures that varied anywhere from four to six levels. The City of Vancouver suggested the parking structure should be designed with a minimal, practicable height, which requires expansion of the footprint to maintain a required number of parking spaces. Additionally, the expansion of the footprint had benefits to the project's other transportation modes. Further analysis of the SR 14 terminus indicated that the roundabout was the appropriate design for this intersection (4th and Columbia), preferred by both the CRC and the City of Vancouver. The CRC staff analyzed multiple roundabout alternative designs in order to minimize the footprint. Through that analysis, it was determined that more right-of-way was required northeast of the

B-003-001

- The FEIS presents conflicting information regarding the development and selection of the "site" for the CPnR, and confuses the selection of the site with the selection of the design option (surface lot versus garage).
- The FEIS significantly understated the economic impacts associated with the proposed demolition of the Historic Lucky Lager Warehouse Building.
- The FEIS did not evaluate land use impacts associated with the proposed demolition of the Historic Lucky Lager Warehouse Building.
- The FEIS erroneously characterized the visual impacts of the LPA for the CPnR.

It is clear that the selection of the LPA for the Columbia Street Park and Ride facility violated NEPA. It is equally clear that the FEIS was prepared to justify the selection of an alternative that would likely not have been selected if the NEPA process had in fact been followed. Again, please place a comment into the ROD which requires the property acquisition for the Historic Lucky Lager Warehouse Building property be postponed until such time as NEPA is satisfied in regards to the selection of the LPA.

Sincerely yours,

Gillian Wallis

Gillian Wallis

Attachments:

Attachment A – NEPA Process Disclosures of Impacts to Historic Lucky Lager Warehouse Building
Attachment B – NEPA Process Errors
Attachment C – Factual Errors
Attachment D – Advisory Group Meeting Minutes
Attachment E – Historic Lucky Lager Warehouse Building Economic Value
Attachment F – Advisory Group Member's Supporting Letters
Attachment G – DEIS Chapter 22 – Description of Alternatives, page 2-34
Attachment H – FEIS Chapter 2 – Description of Alternatives, Park and Rides, pages 2-26 to 2-27
Attachment I – *Historic Lucky Lager Warehouse Building Historical Analysis*, Eric Eisemann, University of Oregon Adjunct Professor in the Master's Program in Historic Preservation

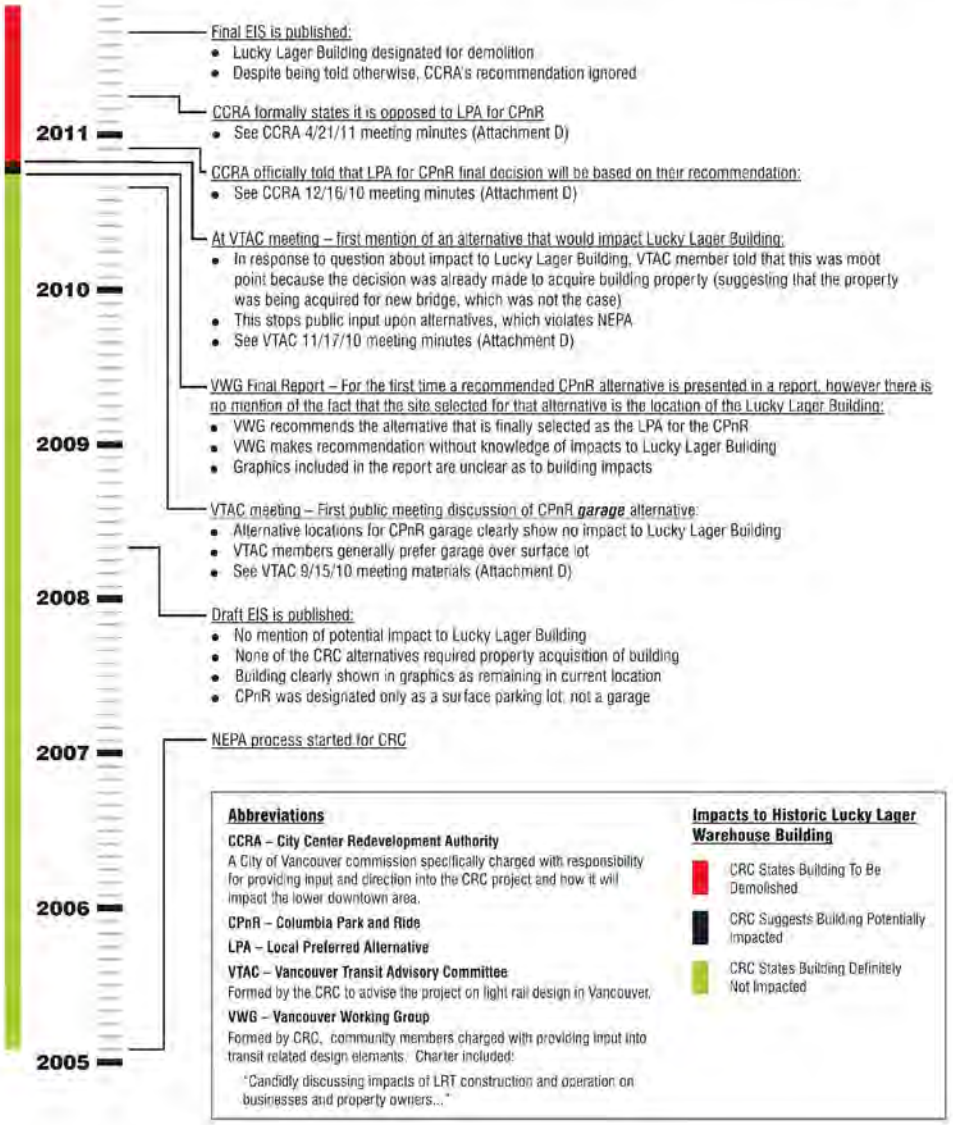
roundabout. The combination of the above-mentioned analysis resulted in the current design and impacts. The FEIS describes the general process for selecting the LPA in the summary on page S-9 and in Chapter 2 starting on page 2-81. The purpose of the FEIS is to disclose the impacts related to the LPA compared to No-Build and the DEIS alternatives and describe what has changed since the DEIS. The FEIS does not contain a detailed description of how each design refinement was done; that level of detail is not typical for an environmental document. Although the Lucky Lager building is listed on the Clark County Heritage Register, it has not been found eligible for the National Register of Historic Places (NRHP). Qualified staff on the CRC project, and from the Esther Short Subarea planning process years before, both determined the building modifications to be too extensive for the building to be NRHP eligible. Regardless of the specifics of eligibility and associated protections, the project has attempted to avoid displacement of any building. Buildings listed on the Clark County Heritage Register are given special consideration.

Attachment A

NEPA Process Disclosures of Impacts to Historic Lucky Lager Warehouse Building

B-003-001

NEPA Process Disclosures of Impacts to Historic Lucky Lager Warehouse Building



Attachment B

NEPA Process Errors

B-003-001

ATTACHMENT B – NEPA PROCESS ERRORS

PROCESS ERROR	IMPLICATION OF ERROR
Columbia Park & Ride LPA Not Fully Evaluated After publication of the DEIS, general evaluations were made between a 1-block garage west of Washington and a surface lot east of Washington. Evaluation and discussions occurred with the public and with advisory groups specifically charged with overseeing park and ride issues. Public preference was for a garage west of Washington. After this preference was indicated, a new 2-block alternative for that garage was introduced to advisory groups in late 2010. Who introduced it or why is not clear in the record. This alternative was not evaluated compared to the 1-block alternative, and its impacts were not made public or discussed in advisory groups or with the public. Letters from members of these groups are attached supporting this (Attachment F).	The implication of this error was that the public was not asked and thus provided no input into the impacts of the Columbia Park and Ride LPA. These impacts were significant. Because the 1-block garage did not impact the Lucky Lager Building and the 2-block garage did, the LPA for the CPnR (which is the 2-block alternative) was selected in direct violation of NEPA.
Public Input for 2-Block Garage Was Suppressed at a Public Meeting In November 2010, a statement was made in an advisory group meeting in response to a member's question. The question was whether the 2-block garage would require the demolition of the Wallis building (i.e., the Lucky Lager Building). A CRC staff member stated that it would be an acquisition in the Final EIS (Attachment D). This falsely implied that the decision to acquire the building property was made as part of other CRC alternative evaluations, which was not true.	The implication of this statement by CRC staff was that members of this advisory group (VTAC) were lead to believe that the decision on the alternative was made and there would be no discussion regarding the size or footprint of the Columbia Park and Ride. This occurred at a meeting whose purpose was to solicit input into the parking garage alternative.

Note: CPnR – Columbia Park and Ride

B-003-001

PROCESS ERROR	IMPLICATION OF ERROR
Land Use Impact of Columbia Park and Ride Not Evaluated No evaluation was made of the impact to current land use plans due to the loss of the Lucky Lager Building.	The loss of the Lucky Lager Building is in direct conflict with the 2007 Vancouver City Center Vision & Subarea Plan and Vancouver Comprehensive Plan. These plans encourage the protection and preservation of historic resources and promote the restoration, rehabilitation and reuse of historically significant older buildings. It is important to note that the current owners of the Lucky Lager Building spent $970,000 restoring the building over the past 10 years, in keeping with the intent of these plans. The failure by CRC decision makers to consider City adopted policy in decision making for the CPnR undermined the ability of the public to provide meaningful input into the selection of CPnR alternatives.
Economic Impact of Columbia Park and Ride LPA is Incomplete The FEIS completely ignored the fact that the Lucky Lager Building's very unique and very appealing character was a significant economic asset for downtown Vancouver. The building has a proven track record of attracting highly creative and innovative businesses to downtown Vancouver (Attachment E). This is why it is one of the few that is completely occupied at a time when downtown vacancy rates approach 15%. Currently 15 businesses with 80 employees work in the building. Although these businesses would be offered relocation assistance, there is a very little stock of similar buildings in downtown Vancouver and many will likely move out of the area.	The failure to address this economic impact undermined the ability of the public to provide meaningful input into the selection of CPnR alternatives. This failure demonstrates the complete bias of the CRC process in regards to the selection of the LPA for the CPnR. In reading the FEIS, it is almost impossible to ascertain the significance of the selection of the LPA for the CPnR. In reading the FEIS, the loss of the Lucky Lager Building is considered insignificant, yet that loss accounts for over 50% of the businesses displaced in Washington for the entire CRC project including bridge, ramps, rail, and the other two park and ride facilities.
Impacted Building's Historic Properties Not Evaluated The Historic Built Environment Technical Report (pgs 3-8 to 3-9) states that although the building is listed on the local historic register, it was found to be not eligible by professional architectural historians as a historic resource in the FEIS. There is no supporting data on how the building was found to be not eligible or the methodology used. Washington SEPA requirements in regards to historic properties were not evaluated. The building is clearly eligible as a historic property under SEPA guidelines, since it is on the Clark County Heritage register (a local historic register established by County Code).	The impact of the loss of this historic building is another example of the failure of the EIS to adequately assess the impacts of the CPnR LPA. This failure undermined the ability of the public to provide meaningful input into the selection of CPnR alternatives. CRC staff, who never discussed the historic issues with the building owners, were not aware of two critical documents, one prepared by local architectural historian Lynn Hunt, and the other by Eric Eisemann, Adjunct Professor in the Master's Program in Historic Preservation at the University of Oregon. Mr. Eisemann in fact prepared the supporting document for the Clark County Heritage Register application which states: "The … building is a significant illustration of simple downtown commercial and industrial architecture from the early 20th century."

Note: CPnR – Columbia Park and Ride

Attachment C

Factual Errors

B-003-001



ATTACHMENT C – FACTUAL ERRORS

THE ERROR	THE FACT	THE IMPLICATION
FEIS Falsely Claims the Location of the LPA for the CPnR Location was Evaluated in the DEIS: Section 2 (pg 2-85) of the FEIS discusses evaluation of multiple park and ride locations associated with transit alignments. It states 3 park and ride locations were selected, and: "These three park and ride locations were evaluated in the DEIS."	One of the three park and ride locations – the Columbia Park and Ride location – was not evaluated in the DEIS. In Chapter 2 of the DEIS – *Description of Alternatives*, a PnR in the general area of the Columbia Park and Ride was shown on *Exhibit 2.3-16* (pg 2-34). This exhibit (Attachment G) shows a surface parking lot on the east side of Washington in the freeway cloverleaf. The DEIS mentions only one location for this PnR and it is not the location finally selected.	By falsely stating that the CPnR location was evaluated, the FEIS masks the failure of the EIS process to provide public input into the selection of the LPA for the CPnR facility. Because there was inadequate public input, the FEIS understates the environmental impact of the LPA for the CPnR.
The FEIS Fails to Distinguish Between "Locations" for the CPnR and "Design Options": Section 2 (pg 2-85) of the FEIS discusses evaluation of multiple park and ride locations associated with transit alignments. It fails to mention that there are location alternatives for the CPnR and for each of these there is the option of a surface lot or parking garage.	There are several location alternatives for the CPnR. In those locations, either parking garages or surface lots are possible. A valid alternative analysis would distinguish between location options and design options. The FEIS makes no such distinction.	By failure to clarify that there are several options as to the location of the CPnR, and for some of these, significantly different design options, the FEIS fails to provide a logical basis for the selection of the LPA or assessment of reasonable mitigation measures.
The FEIS Understates Property Tax Impacts in Vancouver: Chapter 3 – Land Use and Economic Activity in the FEIS includes on page 3-110, *Exhibit 3.4-6 Summary of Economic Impacts*. This table incorrectly states there will be $12,100 in property tax impacts in Vancouver due to the project. Not including partial acquisitions, there are 38 full property acquisitions in Washington for the project.	The Lucky Lager Building alone pays about $15,000 in property taxes annually. It is unlikely it is the only Vancouver property acquisition (out of 38 full property acquisitions) that pays property taxes. The property tax impacts appear to be grossly understated.	This understatement points to the failure of the FEIS to adequately provide a correct assessment of the impacts of the LPA. It also points again to the failure to provide the public the opportunity to provide meaningful input into decision making.

Note: CPnR – Columbia Park and Ride

B-003-001

THE ERROR	THE FACT	THE IMPLICATION
Description of Impacted Building is Incorrect and Incomplete: As stated on the pages listed below: "…The Columbia Park and Ride would require the displacement of 11 professional offices that provide a variety of services in the fields of law, engineering, construction, architecture, land use, and energy, ands well as a food cooperative. Most of these are very small professional offices located in one building." Section 3 (pg 3-89); Appendix O – Attachmt: Environmental NEPA Re-evaluation and appendices (pg 29); Acquisitions Technical Report (pg 4-7); Land Use Technical Report (pg 4-9). Appendix A in the Acquisitions Technical Report incorrectly reports the building had 12 businesses.	The building being displaced contains 15 separate businesses, including 80 employees. The businesses listed failed to mention software design, and financial planning. The use of the phrase "very small" is misleading. The two largest businesses in the building have about 30 employees each, which is above the average number of employees of downtown Vancouver businesses.	These factual errors understate the impacts to the building. The language used is misleading and compounds the understatement. This points again to the FEIS masking the fact that the selection of LPA for the CPnR violated NEPA. It is important to note that the entire CRC project (bridge and all other components) displaced a total of 17 businesses in Vancouver. If the FEIS was correct in the fact that 11 businesses were displaced by the LPA for the CPnR, this one small component of the CRC displaced 1/3 of those total businesses.
Visual Impact of Alternative is Incorrect: Section 3 (pg 3-266) states: "The Columbia Park and Ride structure would be consistent with the urban fabric of the surrounding area." Similar statements appear in Appendix L – Mitigation Matrix, pg L-14.	This statement is incorrect in that the project is taking away part of the urban fabric with which the LPA structure should be compared with. The impacted building, along with two buildings on opposite corners and buildings one block north, are one to two story buildings of about the same age and type. The CPnR LPA is not visually consistent with these buildings.	The implications of this incorrect statement mean that the full impacts of the LPA were not taken into consideration.

Note: CPnR – Columbia Park and Ride

Attachment D

Advisory Group Meeting Minutes

Columbia River CROSSING

Meeting Summary

MEETING: Vancouver Transit Advisory Committee (VTAC)
DATE: September 15, 2010, 4:00 to 6:00 PM
LOCATION: Clark County Elections Building, Vancouver, WA

B-003-001

Attendees:

Vancouver Transit Advisory Committee Members

• Rob Barrentine	American Institute of Architects, Vancouver
• Ken Becker	Lincoln Neighborhood Association
• Marci Carr	Property Owner
• Sara Carter	Vancouver Resident: C-TRAN Commuter
• Lee Coulthard	Vancouver Downtown Association
• Caroline Hutton	Property Owner
• Elizabeth Jordan	Vancouver-Clark Parks & Recreation
• Mark Masciarotte	CRC Urban Design Advisory Group
• Terry McCarthy	Esther Short Neighborhood Association
• Randy Salisbury	Vancouver Resident: Architect
• Bob Sellers	C-TRAN Citizens Advisory Committee
• Vicki Vanneman	Marshall Community Center
• Debby Watts	Vancouver Resident: 17th Street Property
• Bob Williamson	Clark College

Staff:

• Katy Belokonny	CRC
• Wes King	CRC
• Nolan Lienhart	ZGF
• Brian McCarter	ZGF
• James McGrath	ZGF
• Scott Patterson	C-TRAN
• Jeff Hamm	C-TRAN
• Matt Ransom	City of Vancouver
• Sandra Towne	City of Vancouver

Note:
- **Meeting materials** and handouts referred to in this summary can be accessed online at: http://www.columbiarivercrossing.org/ProjectPartners/VTACMeetingMaterials.aspx

B-003-001

Welcome/Meeting Goals **Matt Ransom**

Matt Ransom welcomed members to the VTAC meeting and introduced new staff members. Ransom said that the goals of the meeting are to provide direction to CRC staff regarding streetscape and station design concepts, as well as discuss the Lower Downtown Vancouver Design Refinement that will be featured at Monday's Open House.

Station & Streetscape Design **Brian McCarter/Nolan Lienhart**

Brian McCarter and Nolan Lienhart, transit urban designers with ZGF Architects, gave a slide presentation (available at the Web address above) illustrating various downtown Vancouver street design (i.e. streetscape) and station design options. The VTAC expressed a preference for "Streetscape Concept 1: The Hybrid" option, which is consistent with the City of Vancouver Main Street Study. The station design options explored various degrees of [1]hardening, ranging from an open station to a hardened station, and applied the treatments to site-specific locations. McCarter said that the station design concepts featured in the presentation are specific to the four light rail station platforms located between 9th and 16th streets. The touchdown and terminus stations will be designed individually.

Questions and Discussion

STREETSCAPE

Street Treatment:

Mark Masciarotte said that he prefers concrete paving to asphalt, but acknowledges that it is more expensive. McCarter said the concrete paving is currently not in the project budget, but volume purchasing discounts can be explored.

Landscaping:

Randy Salisbury asked if we can make the sidewalks wider instead of having a landscaping strip. McCarter said that we can customize designs to accommodate individual property owner preferences. Terry McCarthy suggested that landscaping not be included as part of the design, until a specific funding mechanism is identified, because the City of Vancouver does not maintain current landscaping. Ransom said that there are no funds set aside for planting maintenance so it is important to think critically about the design's longevity. Elizabeth Jordon said that it is important to differentiate between trees and shrubbery; specifically prioritizing maintaining the tree canopies and realizing that trees are much easier to maintain than shrubs.

Masciarotte said that there should be trees in the station areas to provide shade to transit riders.

Overhead Catenary System (OCS):

Salisbury asked about the various OCS options for the light rail system and recommended that whether a cantilever or span wire system is used, that it be a dual-use pole (i.e. combined with light fixtures and/or traffic signals).

Light Fixtures:

Rob Barrentine asked if the light fixtures need to match the current downtown standard or if something other than an ornamental can be considered to ensure efficient street lighting. Ransom said that in order to use something other than the current light fixture, there would have to be a code change to the City of Vancouver's light district standards. McCarter confirmed that the lamp within the fixture can be changed from what is currently used to create a brighter light.

[1] *STATION HARDENING IS A TERM USED TO DESCRIBE THE USE OF PHYSICAL TO DEFINE SPACE IN AND AROUND A TRANSIT STATION, AND TO CONTROL MOVEMENTS IN AND OUT OF THE STATION ITSELF. THERE ARE VARYING DEGREES OF STATION HARDENING, WITH VARYING LEVELS OF ACCESS CONTROL AND MANAGEMENT.*

B-003-001

McCarter said that the city standard of six light fixtures per block will ensure enough light is provided. Ransom said that existing light fixtures will be replaced, as part of the project, which will provide an opportunity to examine each fixture for luminosity and maintenance needs.

Caroline Hutton agreed that good lighting is essential at the light rail stations.

LIGHT RAIL STATION DESIGN
Jeff Hamm challenged the committee to work through the benefits and disadvantages to open vs. closed stations (i.e. hardening can help with fare enforcement, but infrastructure can clutter the sidewalk).

McCarter reminded members that station design priorities should be consistent with the Urban Design Advisory Group recommendations, the Vancouver City Center Vision, the City of Vancouver Main Street Study, and the Vancouver Working Group Key Considerations.

Station Design Comments
Marci Carr said that Vancouver is not Portland and that we should stop trying to mimic the station designs that have been used there. Carr elaborated by saying that we have different pedestrian and transit rider needs in Vancouver and that Vancouver's stations need to be designed in a way that reflects the friendliness, neighborly, hominess of the city.

McCarter suggested that consideration be given to moving the 9th Street Station light rail shelter to the north end of the block, in front of a parking lot, to allow more sidewalk space in front of the restaurant located at 901 Washington Street.

McCarthy said that technology will greatly advance by 2018 and will allow for new opportunities to monitor fare evasion.

Salisbury said that he likes the idea of roof overhangs being mounted on buildings at station blocks to serve as the shelter. McCarter said that they are actively pursuing this concept at the Mill District station because the parking structure will lend itself to combining the sidewalk and station area.

Masciarotte suggested approaching the station design less linearly by staggering the infrastructure to ensure that transit riders do not feel trapped in the station area. Masciarotte added that his experience with hardened stations across the country is that they tend to be very oppressive, and somewhat dangerous, environments.

Open Stations Preferred
Members' specific open station design preferences are as follows:

- Intermix as many different uses as possible (example: Davis Street Station in Portland, Oregon, as seen on pg. 16 of slide presentation); the sidewalk and the station should be considered shared-use space.
    - Wesley King reminded members that all non-station blocks will be completely open.
    - McCarthy said that stations need to be designed to reflect a 2020 transit-oriented community vision, instead of designing segregation between pedestrians and transit riders. McCarthy added that the lack of architecture in the station area will allow intermixing of pedestrians and transit riders and will help change social attitudes regarding transit.
- No glass screens used in front of businesses; openness is a priority.
- Use transit security and ordinances or policies, instead of structure, to provide fare enforcement and safety/security.

B-003-001

- Ransom said that the City of Vancouver is pursuing enacting an ordinance that allows C-TRAN the maximum fare enforcement authority.

- Locate the shelter pole in the center of the station area, instead of at the back of the station area, so that transit users and pedestrians can seamlessly intermingle.
- Site-specific light rail station design should be used to create stations appropriate for each adjacent property.
- Instead of using physical barriers to separate transit riders from pedestrians, use pavement demarcation (via color or pattern) and signage.
- Apply a modular concept, meaning that the stations should be initially built as open stations, but designed in such a way that infrastructure (i.e. wind screens or leaning rails) can easily be added to the stations as needed.
  - Sara Carter said that it is a mistake to initially build hardened stations when the station areas have not yet proven to be problematic.
  - Jordan said that members need to think about the 10 percent of the general public that are going to cause problems and attempt to design stations in a way that preemptively solves problems.
- The station infrastructure should be minimal, however certain transit rider amenities should be incorporated, including wind screens and leaning rails.
- An equally high priority should be placed on the pedestrian environment, as the transit environment.
  - Barrentine said that there is a poor quality of space for pedestrians on station blocks, when the station is hardened, because the sidewalk area is unwelcoming and simply a place to move through.

Ransom summarized the members' discussion by saying that the committee clearly articulated a preference for an open station design.

Jeff Hamm said it is an important exercise to explore all options, from completely open to closed, so that the pros and cons of each design option can be understood and explained.

Bob Williamson said that station blocks being pedestrian friendly and safe for transit riders are not incompatible goals. Williamson encouraged members to be willing to compromise and approach station design with creativity.

King said that although the VTAC has communicated a preference for open stations, C-TRAN does have certain design requirements that will also have to be accommodated. King said that a semi-hardened station may be the solution so that transit amenities and infrastructure can be provided to accommodate C-TRAN rider and safety needs, but placed in a strategic way to also create a pedestrian-friendly environment.

ADDITIONAL QUESTIONS/COMMENTS
Carter asked how busses get back into traffic after being at a full-block bus stop. McCarter said that signal preemption will be considered for peak traffic times.

Bob Sellers asked about the width of the sidewalks and if they are going to be wide enough for wheelchair accessibility. McCarter said sidewalks will be 19.5' wide at station blocks and 17' wide at non-station blocks, which provides sufficient space for wheelchairs.

Lower Downtown Vancouver Design Refinement **Wesley King**
Wesley King, Deputy Transit Team Manager with CRC, gave a slide presentation (available at the Web address above) showing new developments in the design of the light rail station area south of Seventh Street in downtown Vancouver. Members expressed a preference for the Park & Ride location between Washington and Columbia streets and 4th and 5th streets because of the

B-003-001 opportunity for a mixed-use function on the first floor of the structure, as well as joint-use parking opportunities. The VTAC also communicated support for 5th Street being a through street to help maximize vehicular circulation in the downtown core.

Closing **Matt Ransom**

Ransom invited committee members to attend the upcoming Vancouver Light Rail Design Refinement Open House, occurring Monday, September 20, 2010 from 6:00 – 8:00 p.m. at the Hilton.

The next VTAC meeting will occur on Wednesday, October 20, 2010 from 5:00 – 7:00 p.m. at the Vancouver Housing Authority (2500 Main Street, Vancouver, WA 98660).

NOTE: pages removed from this presentation for brevity

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Oregon Department of Transportation

Washington State Department of Transportation

B-003-001

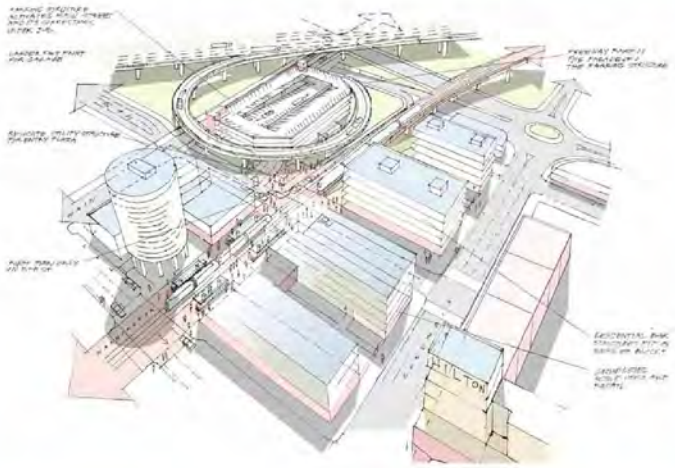
Lower Downtown Vancouver LRT Design Refinements

Wesley King & Matt Ransom

September 15, 2010



Park & Ride Location: *Option 1*



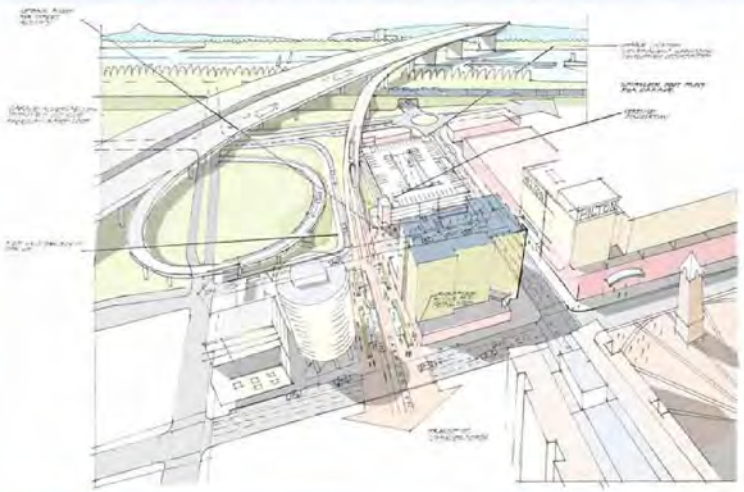
Columbia River CROSSING

Park & Ride Location: *Option 1*



Columbia River CROSSING

Park & Ride Location: *Option 2 (recommended)*



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Park & Ride Location: *Option 2 (recommended)*



Columbia River CROSSING

B-003-001

See Page 5 highlighted text

Columbia River CROSSING

Meeting Summary

MEETING: Vancouver Transit Advisory Committee (VTAC)

DATE: November 17, 2010, 4:00 to 6:00 PM

LOCATION: C-TRAN Administration Building: 2425 NE 65th Avenue, Vancouver, WA 98661

Attendees:

Vancouver Transit Advisory Committee Members

• Ken Becker	Lincoln Neighborhood Association
• Marci Carr	Property Owner
• Troy Drawz	Vancouver Housing Authority
• Caroline Hutton	Property Owner
• Dean Irvin	Property Owner
• Elizabeth Jordan	Vancouver-Clark Parks & Recreation
• Dick Malin	Central Park Neighborhood Association
• Mark Masciarotte	CRC Urban Design Advisory Group
• Terry McCarthy	Esther Short Neighborhood Association
• Dick Pokornowski	CRC Urban Design Advisory Group
• Randy Salisbury	Vancouver Resident: Architect
• Vicki Vanneman	Marshall Community Center
• Debby Watts	Vancouver Resident: 17th Street Property Owner
• Bob Williamson	Clark College

Staff:

• Katy Belokonny	CRC
• Wesley King	CRC
• Nolan Lienhart	ZGF
• Greg Baldwin	ZGF
• James McGrath	ZGF
• Scott Patterson	C-TRAN
• Jeff Hamm	C-TRAN
• Matt Ransom	City of Vancouver
• Sandra Towne	City of Vancouver
• Thayer Rorabaugh	City of Vancouver
• Phil Wuest	City of Vancouver

Note:

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B-003-001

Welcome/Meeting Goals **Matt Ransom**

Matt Ransom welcomed members to the VTAC meeting and introduced Greg Baldwin. Ransom said that the goals of the meeting are to provide direction to CRC staff regarding Park & Ride design concepts, as well as hear an update on the Overhead Catenary System and the light rail station design.

Park & Ride Design **Greg Baldwin/James McGrath**

Greg Baldwin and James McGrath, transit urban designers with ZGF Architects, gave a slide presentation (available at the Web address above) illustrating various Park & Ride design options. The VTAC expressed a preference for a living wall, green themed design for the Central Park garage; a brick design for the Mill garage; and a modern design incorporating glass and stone for the Columbia garage.

Questions and Discussion

CENTRAL PARK

Maintenance:

Terry McCarthy asked who is responsible for paying for the maintenance of the facility. He elaborated by saying that he supports the proposed living wall facade, but is concerned by the maintenance responsibility.

Wesley King explained that transit riders cannot be charged for parking in a Federal Transit Administration-funded garage, but that shared-use options are being investigated.

Bob Williamson said that if charging for parking is the only way to fund the maintenance of the structure then Clark College would have great concerns.

McCarthy said that it is necessary for maintenance funds to be identified prior to determining façade treatments for the garages and that he would like a commitment from the funding partners regarding maintenance.

Baldwin said that when project staff computes the cost for the designed structures, they also identify the continued maintenance fee.

Jeff Hamm said that C-TRAN's ballot measure funds will include funding the maintenance of the Park & Ride structures.

Façade Treatment:

Bob Williamson said that Clark College is very supportive of the proposed green theme. Williamson also said that the college is currently constructing a Science, Technology, Engineering, and Mathematics (STEM) building using brick and that CRC staff may want to tie the campus design theme into the Central Park façade.

Baldwin cautioned about using a heavy façade material on the large size of the structure.

Vicki Vanneman and Elizabeth Jordan said that they support the green façade treatment as long as there is an adequate maintenance plan identified.

Vanneman said that Hudson's Bay High School has a large horticulture program that may be key in maintenance of the structure.

B-003-001

Jordan said that community volunteers and gardeners already greatly support area projects and that there needs to be a different master plan for the maintenance of the Central Park garage.

Masciarotte said that there is relatively low-maintenance greenery available and that greenery selection is essential.

Caroline Hutton suggested that rainwater be used to water the greenery at the Central Park structure.

Pedestrian Circulation:

Mark Masciarotte asked about pedestrian circulation in the Central Park & Ride.

Terry McCarthy said that it would be beneficial to add a pedestrian access on the west side of the structure for emergency purposes.

Randy Salisbury said that the code dictates how many pedestrian accesses are necessary.

Miscellaneous:

Dick Pokornowski asked about the exact location/placement of the Central Park & Ride in proximity to Interstate 5 and McLoughlin Blvd.

Dick Malin asked about the seismic stability of the Central Park & Ride.

Greg Baldwin said that the garage has been designed to code requirements and that the structure's materials of concrete and steel are both seismically sound.

Ken Becker asked about who is planned to staff the security office identified in the design of the Central Park & Ride.

Matt Ransom explained that C-TRAN currently has security staff and that an on-site presence will be helpful in monitoring the light rail system.

Debby Watts asked if mixed uses are planned for the first floor of the Central Park structure.

Ransom said that none are planned for this site, but are incorporated in the designs for the other two Park & Rides.

MILL

Maintenance:

Vanneman asked about the exterior wood option for the Mill structure and expressed concern about the maintenance of the wood. Vanneman encouraged exploration of the type of faux-wood product being used on the new downtown library.

Salisbury said that the faux-wood product being used on the library is actually ceramic, which is easier to maintain than wood.

Baldwin agreed that the selected façade material needs to be durable enough to be a permanent screen.

B-003-001

Façade Treatment:

Hutton said that her façade preference would be to use a combination of the brick and wood façade options because each option has historical significance in the area.

Jordan said that the brick is a warm façade treatment and has a historic tie to downtown Vancouver.

Malin asked about the seismic stability difference between using brick or wood.

Baldwin stated that they would be equally seismically fit because they would both be designed to the current code.

Masciarotte said that it is essential to match the design of the Historical Museum, which has a brick facade.

Mixed-Use:

Jordan asked about if a retail market study has been conducted to see if the area can support new retail as a mixed-use function of the Mill garage.

Ransom said that a retail study has not been conducted, but that including mixed-use in this structure is a code requirement. Ransom elaborated by saying that mixed-use does not necessarily mean retail and that the most appropriate use might be office, etc.

Baldwin added that actively encouraging retail to locate in Park & Ride structures is essential in finding retail tenants for the space.

King said that a Transit Oriented Development Committee will be convened shortly and will be asked to evaluate the active use opportunities in the parking garages.

Hutton asked if the mixed-use space is designed to accommodate a large tenant.

Baldwin said that the space is not big enough for a large grocery store, but could work for a specialty grocery store such as New Seasons.

Hutton asked if there was a joint-venture opportunity to add residential on top of the parking structure and, if so, how that would affect the solar panel effectiveness of the current design.

Baldwin said that is would affect the solar panel effectiveness, but that other structural changes would have to be accommodated as well.

McCarthy said that many residents are not excited about the Mill Park & Ride due to increased traffic volumes, and that he does not want to add more congestion downtown by adding additional uses to the structure.

Sandra Towne asked if there is an opportunity for the structure to be designed taller so that it did not use the entire footprint of the block.

Baldwin said that the block is large enough to accommodate the Towne's proposed design, but that a taller and narrower garage would cost more to build and that its circulation would be slightly less efficient. Baldwin added that it would be important to identify the use of the remainder of the parcel before implementing the aforementioned plan.

B-003-001

Miscellaneous:

Hutton asked about bike parking accommodations at the parking structures.

Baldwin said that the ground floor of the Mill garage includes bike spaces, and that all three of the parking structures plan for bike parking.

Dick Pokornowski asked how staff plans on controlling who parks in the structure (i.e. transit or non-transit rider).

King explained some options and said that technology will continue to progress and allow even more opportunities.

COLUMBIA

Location:

Becker asked about the location of the southern-most Park & Ride.

King said that the project has currently identified the Columbia site, instead of the SR-14 on-ramp site, as the southern-most Park & Ride location. King said that one of the reasons the Columbia site was chosen was because of the active-use opportunities of the Columbia site.

Becker asked about the footprint of the Columbia structure and if the Wallis Building is planned to be acquired by the project.

King said that it is currently identified in the Final Environmental Impact Statement as an acquisition.

Becker asked about the benefit lost to the structure if it were to be shortened or if the space in the center of the structure was eliminated.

Dean Irvin asked about the location where light rail meets ground in relation to the Columbia Park & Ride.

Landscaping:

Masciarotte asked about the area around the structure and if it will contain landscaping.

Baldwin said that the amount of landscaping included on the site depends on the transit needs to use the area.

Towne clarified that the center of the Columbia structure is open to the air.

There were questions about the appropriate landscape use of the space inside the Columbia structure.

Façade Treatment:

McCarthy said that the Columbia structure needs to be aesthetically designed to be compatible with the bridge structure.

McGrath said that the east edge of the structure is being designed to respond and interact to the large structures around it.

B-003-001

Pokornowski said that the east side of the Columbia Park & Ride provides an opportunity to visually brand and create identity for downtown Vancouver.

Members agreed that the glass and stone structure should contain an east side that, perhaps through a lighting technique, provides an iconic design.

Masciarotte said that he really likes the idea of a glass structure that could be lit on the east side and asked if there would be a Federal Aviation Administration concern with lighting the east side of the structure.

Miscellaneous:

McCarthy asked about how the streetcar to the waterfront would interface with the Columbia site.

Ransom said that the streetcar would travel on Main Street, not Columbia Street.

McCarthy said that he would like to be sure that the structure is designed to support shared-use capacity to accommodate people who will be accessing the waterfront.

Overhead Catenary System **Matt Ransom**

Ransom briefly reviewed the Overhead Catenary System (OCS) plan for the light rail alignment in Vancouver. Please refer to the Web address above to view the slide presentation.

Light Rail Station Character **Wesley King**

King discussed the station design from a shelter design perspective.

Masciarotte and Hutton said that they like the transparent shelters.

Irvin said that he would like the shelters designed individually so that each shelter can be different based upon its location. Irvin added that he would like the same customized detail given to each shelter that the Park & Rides received.

Troy Drawz cited the light rail shelter, located by the Widmer Brewery in Portland, OR, as an example of a shelter that was uniquely designed to represent the surrounding area. Drawz said that he is also surprised that the Fort Vancouver historic theme has not been tied into the design of the parking structures or the light rail shelters.

Consensus of the group is that individualization of the shelters is essential.

Light Rail Station Design **Jeff Hamm**

Jeff Hamm said that C-TRAN is hiring a design firm to analyze the functionality and aesthetics of the current light rail station design. Hamm emphasized that this effort is essential because of the community concern expressed to C-TRAN regarding the safety and security of the light rail stations.

Closing **Matt Ransom**

Ransom summarized the action items and progress of the meeting as follows:

- CRC staff will progress the Park & Ride designs as directed,
- The OCS system, as presented, will be incorporated into project engineering plans,
- The light rail station design will be undergoing a safety/security analysis, and

B-003-001

- The light rail shelters will need to be brought to the VTAC for individual design customization.

Ransom said that it is undecided whether there will be a December VTAC meeting. However, if it does occur, the meeting will be held on Wednesday, December 15, 2010 from 4:00 – 6:00 p.m. at the Clark County Elections Building (1408 Franklin Street, Vancouver, WA 98660).

See Page 2 highlighted text

Official website of the City of Vancouver, Washington

Vancouver, Washington, USA

Pride, Progress, and Possibilities

City of Vancouver » City Government » Boards and Commissions » City Center Redevelopment Authority (CCRA)

City Center Redevelopment Authority (CCRA)
Meeting Minutes - Thursday, December 16, 2010
City Hall Council Chambers

B-003-001

MINUTES OF THE
CITY CENTER REDEVELOPMENT AUTHORITY
THURSDAY, DECEMBER 16, 2010
COUNCIL CHAMBERS, CITY HALL

MEMBERS PRESENT: Ward Cook, Debi Ewing, Marc Fazio, Richard Keller, Dick Pokornowski, Chris Wamsley
MEMBERS ABSENT: Jack Onder
STAFF PRESENT: Eric Holmes, Brent Boger, Matt Ransom

APPROVAL OF MINUTES
MOTION MADE BY RICHARD KELLER, SECONDED BY DICK POKORNOWSKI AND PASSED UNANIMOUSLY TO APPROVE THE MINUTES FOR SEPTEMBER 16, 2010.

GENERAL PROJECT UPDATES

Waterfront
Eric Holmes informed board members that BNSF recently held its first preconstruction conference with Nutter Underground. Excavation and preparation for shoofly construction will be underway soon.

Library
The Library project remains on schedule and on budget, with a grand opening anticipated in July, 2011. Holmes reminded board members that the parking garage originally intended as part of the project would be partially funded through the State's Local Infrastructure Financing Tool (LIFT) pilot program. Construction of the garage could begin as late as 2014 in order to receive the maximum benefit of the state contribution.

City Hall – 415 Building
Regarding the new City Hall project, Holmes informed board members that a small contract for tenant improvements has already been let. A larger contract that will cover construction of Council Chambers and the permit center will follow in early 2011. According to the current construction schedule, staff will begin moving mid-late first quarter, with the final phase of moves to be completed by the first part of August.

TRANSPORTATION UPDATE
Matt Ransom provided board members with a memo outlining status of the City's involvement in the I-5 CRC project and an overview of various initiatives connected to the overall project.

Community Connector
Regarding the proposed lid over I5, Ransom stated that potential scenarios are currently being evaluated. Planning of bike and pedestrian elements is ongoing.

Bridge Design and Aesthetics
An independent review panel recently convened for a second round of discussions related to proposed design and aesthetics. A new set of design concepts may be brought forward soon. It is anticipated that the final report will be issued in January.

Downtown Park and Ride Facilities
Ransom reminded board members that two Park and Ride facilities are proposed in the downtown area. At the September meeting, CCRA board members authorized staff to draft a letter on its behalf

B-003-001

to City Council recommending one site in the Mill District, and one site at 4th & Columbia.

Ransom provided a presentation originally prepared for the Vancouver Transit Advisory Committee (VTAC), which outlined the Downtown Park and Ride Facilities architectural design study that is currently underway (*see PowerPoint presentation titled I5 CRC Park and Rides Architectural Concepts dated December 16, 2010*).

Ransom presented members with examples of several garages and architectural elements, noting the consultant has given careful consideration to designs, materials and patterns currently present in the downtown core. The board was reminded that all sample renderings were draft in nature.

Both sites will have commercial space that may be leased for office or retail use. Active pedestrian fronts will be key elements of each design.

Mill District Site
C-Tran will likely have offices or a pass sales location on the ground floor of this 6-story facility. Two floors of retail are proposed. The consultant is working to build good connections east and west for pedestrian circulation at this site.

Matt presented renderings of wood and brick exterior options for this site and noted that the VTAC supports the brick alternative.

Columbia Site
Ransom reminded board members that it had discussed this proposed facility at two previous meetings. Leasable space at this location would primarily front Columbia Street. As this is an irregularly shaped site, the interior of the space would be open. A landscaped area on the second floor would create a more efficient use of space within the garage and facilitate ease of access for pedestrians to the ground level. Five floors are proposed for this site.

Regarding exterior options, Ransom stated that the architect has proposed utilizing the same stone as that found on the Convention Center for the ground floor. The upper stories would be shrouded by a modern, glass fin system that will ensure light into the garage during the day and allow transfer of light from the garage onto the street during the evening.

Marc Fazio asked if it would be feasible to build an interior greenspace that would only be visible to garage users and expressed concern over the fact that this interior, isolated and accessible space may be attractive to the homeless population.

Chris Wamsley suggested the design team consider something other than a greenspace in that area, siting ongoing maintenance concerns.

Ransom assured the board that the interior open space was created to accommodate asymmetry of the block and stated that no parking spaces would be lost as a result of the proposed design element. Staff trusts the architect is working to optimize the efficiency of the material costs and construction of the interior space. He will present the board's concerns to the design team for their consideration.

Chris Wamsley expressed concern regarding the amount money being spent on the designs and requested confirmation that the architect has been provided with a formal budget to work within.

Matt confirmed that the architect does have a design budget for the Park and Ride facilities and is prepared to work within that.

In terms of next steps, Ransom stated that the architect and design team are soliciting feedback from the VTAC and CCRA regarding the proposed design elements for each facility.

Deb Ewing asked what formal next steps would need to take place before the designs are finalized.

Ransom stated that staff will brief City Council on the proposed locations early in 2011. Discussions regarding the garages, shared use or parking and management options will follow. Council will not need to take action on the preferred location. The final decision will be based on the CCRA recommendation, as presented by staff.

B-003-001

Ward Cook raised the question of future maintenance for a modern, glass structure and expressed concern regarding construction of a facility that could potentially outshine the neighboring Hilton.

Dick Pokornowski asked staff to communicate the need for an aesthetically pleasing exterior that would compliment the Convention Center and requested additional information regarding the upper deck. Hilton guestrooms on the east side should not have views of a parking lot.

Ransom stated that parking on the upper deck will likely be visible from the hotel, but suggested that the design team could work with various elements to ensure it is visually pleasing (trees, trellis systems, etc).

Eric Homes stated that the proposed locations and design elements would be brought before Council for consideration in early 2011. In the meantime, Holmes assured board members that staff would compile information regarding progress of active CRC subcommittees, decisions and timelines in order to ensure the CCRA remains well informed throughout the process.

Chris Wamsley asked if there was a date on the timeline that would trigger loss of funding for the entire CRC project.

Holmes stated that the largest window of opportunity influencing that decision is the six-year reauthorization of the federal highway bill which scheduled the existing law. The original bill expired in 2009. It has been extended and should be taken up in the first half of 2011.

Under The Bridge – Waterfront Park Space
Matt stated that he would not have time to brief members on this project, but would be happy to attend the January meeting in order to provide an update.

Eric Holmes suggested the board dedicate its next meeting agenda to further discussion regarding Park and Ride design and the park space being planned under the bridge.

Ransom agreed to return in January with consultants for each project.

ELECTION OF OFFICERS
Ward Cook opened nominations for the offices of Board President and Secretary / Treasurer to serve throughout 2011.

Debi Ewing recommended that board members currently holding each position be reappointed.

MOTION MADE BY DICK POKORNOWSKI, SECONDED BY DEBI EWING AND PASSED UNANIMOUSLY TO NOMINATE WARD COOK AS PRESIDENT AND RICHARD KELLER AS SECRETARY FOR 2011.

BOARD STAFFING
Eric Holmes informed board members that Interim Assistant City Manager, Paul Lewis, would serve as staff for the City Center Redevelopment Authority (CCRA) until the recruitment process for a new Assistant City Manager is complete. The CCRA will become part of the Assistant City Manager's portfolio. The position was advertised in early December, and Staff anticipates a final selection by mid-March.

NEXT MEETING
There being no other business, the meeting was adjourned at 1:03pm.

The next meeting is January 20, 2011.

Approved:

_____
Ward Cook, President

B-003-001

See Page 5 highlighted text

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City of Vancouver Washington, USA *Pride, Progress, and Possibilities*

City of Vancouver » City Government » Boards and Commissions » City Center Redevelopment Authority (CCRA)

City Center Redevelopment Authority (CCRA)
Meeting Minutes - Thursday, April 21, 2011
City Hall Council Chambers

MINUTES OF THE
CITY CENTER REDEVELOPMENT AUTHORITY
THURSDAY, APRIL 21, 2011
COUNCIL CHAMBERS, CITY HALL

MEMBERS PRESENT: Ward Cook, Richard Keller, Jack Onder, Dick Pokornowski
MEMBERS ABSENT: Marc Fazio, Chris Wamsley, Debi Ewing
STAFF PRESENT: Brent Boger, Paul Lewis

APPROVAL OF MINUTES
MOTION MADE BY DICK POKORNOWSKI, SECONDED BY RICHARD KELLER AND PASSED UNANIMOUSLY TO APPROVE THE MINUTES FOR FEBRUARY 17, 2011.

GENERAL PROJECT UPDATES
Paul Lewis informed board members that tenant improvements at the new City Hall have been underway for the past month. Phased move in dates are targeted for June through August. Lewis reminded the board that this project will consolidate administrative staff from five separate locations throughout the city into one building. The Esther Short Building at 610 Esther Street will be vacated as a result of this move. It has been on the market for approximately one month with a formal asking price of $5.4M.

Farwest Steel is moving forward with construction of their project at the Port of Vancouver, and will be the first in our area to apply for New Market Tax Credits. The application process for this element of funding has been a collaborative effort between Farwest Steel, the City of Vancouver, Port of Vancouver and National Development Council. An announcement is expected within the next 30 days.

The Chamber hosted a soft opening of Fort Vancouver's new Main Library on March 22nd. It was a well-attended event. Grand Opening is schedule for July 17, 2011.

PeaceHealth continues to evaluate potential locations in Vancouver. Their site selection process is expected to conclude in June.

Regarding the Waterfront Access Project, Paul informed board members that construction of the Grant Street Bridge is approximately 50% complete. Site work continues in preparation of shoofly and T-Wall construction.

Paul informed board members that the Tax Increment Financing Bill and Public Facilities District tax credit extension bill appear to be dead for this legislative session. Mark Brown has indicated they are hopeful that additional funds may be available for a second round of Local Revitalization Financing, but was not incredibly optimistic it would come to fruition.

PRESTIGE PLAZA DEVELOPMENT AGREEMENT UPDATE
Paul provided board members with an overview of proposed revisions to the Prestige Plaza Development Agreement (*presentation titled Prestige Plaza Update, April 21, 2011*).

Proposed Development Program
The developer has proposed a full block, primarily residential, mixed-use complex to include:

- Residential Apartments: 92 units total
- 11,300 sf of commercial space

B-003-001

- 12 studios
- 46 one bedroom / one bath
- 34 two bedroom / two bath
- 5,600 sf on Mill Plan and 13th St
- Live/Work or Retail

Elie Kassab reminded board members that his team began preparing for a full block development at this location in 2006, but the final 15,000 square feet were not acquired until December, 2010. The proposed development consists of two L-shaped buildings, with corners on C St/Mill Plain and D St/13th St. Elie assured board members that this would be a very nice project, designed to attract additional housing developments to the downtown area. Elie noted that each building will offer a conference room, small gym and gathering space on the 4th floor, with outdoor balconies on the SE and NW corners of the complex.

Paul Lewis presented conceptual renderings of the development and specifically addressed the parking option proposed. Under Elie's current plan, parking would be located between each of the buildings, with a portion of it to be covered by structural overhang. The Code for this type of development calls for structured parking. It is unclear as to whether or not the current design would satisfy code requirements. Although the proposed concept provides surface parking only, the plan does remove cars from the street and bring them to the interior of the project.

Regarding schedule, Elie stated that Burgerville is tentatively scheduled to vacate in September and he would like to begin the anticipated 12-14 months of construction in October. Prestige will begin pre-leasing mid-construction and predicts it will take 6 months to fill both buildings.

Jack Onder asked Elie to speak to the retail versus live/work units proposed along Mill Plain, reminding the board that one of the Vancouver City Center Vision's (VCCV) main goals is to activate downtown streets.

Elie stated that he is open to placing retail on Mill Plain, but this decision will be dependent on the market. He noted that 13th Street would likely be more appropriate for Live/Work units that could accommodate a single operator (ie attorney, graphic designer or architect). Smaller retail spaces on the corners of Mill Plain/D St and 13th/C St could be ideal for a deli or convenience store. Elie noted that medical and dental tenants have also been considered.

Wark Cook asked where commercial / retail patrons would park, considering there are no spaces along Mill Plain.

Elie confirmed customers would utilize designated parking within interior of the development.

Jack Onder asked how many parking spaces were included as part of the proposed plan.

Paul Lewis confirmed that the 68 spaces anticipated would meet required codes for the residential and retail portion of the development. The pre-application conference scheduled for May 5 will confirm this project meets parking requirements.

Jack Onder cautioned Elie that renters often require a designated parking space. With 92 units and 68 parking spaces, this could prove problematic.

Elie reminded board members that there is a great deal of underutilized parking along 13th that could be designated for residents and potentially generate parking revenue for the city.

Summary of Proposed Changes

- Full Block Development - The original agreement was only for the property which Elie controlled at the time. The current proposal assumes a full block development (40,000 sq ft) and includes the current Burgerville location acquired in late 2010.
- Adjusts development program to match current development proposal.
- Addresses vesting of transportation capacity and system development charge credits for added property. Additional transportation capacity will be reserved based on the trips with the existing use.
- Potential for earlier start date - The original agreement anticipated a deadline of 2016 as its start date. The current schedule assumes construction will begin in October, 2011.

B-003-001

- Potential for Live/Work units on ground floor
- No bank or drive-thru feature
- No below-grade parking

	Original	Original with Added Property	Proposed
Minimum Building Height	5 Stories	5 Stories	4 Stories
Minimum Floor Area Ratio	3.0	3.0	2.5
Minimum Building Size	74,000	118,000	99,000
Minimum Gross Floor Area	60,000	96,000	90,000
Minimum Residential	40,000	64,000	80,000
Minimum Retail	10,000	16,000	10,000
Maximum Office	10,000	16,000	15,000
Other			
Retail on 1st Floor	✓	✓	✓ "Commercial"
Office Allowed on 1st Floor	No	No	Yes (live / work)

Next Steps

In terms of next steps, Paul noted that a pre-application conference was scheduled for May 5 and asked the board to consider a motion approving revisions to the original development agreement and forward its recommendation to City Council for their consideration.

Regarding financing, Lewis informed board members that the developer is still working to secure a funding package. Mr. Kassab will likely submit a request for Multi-Family Tax Exemption as an element of financing for this project. If an application for abatement is brought forward, it will be the first one received by the City in a number of years and necessitate revision of the original ordinance to comply with changes made to the State statute in 2007. In addition to the required updates, staff may propose creation of another residential target area along the Fourth Plain corridor.

Jack Onder asked if all units would qualify for the tax emption.

Paul Lewis stated that the tax exemption applies to all of the multi-family new construction but not the commercial development or the land. A twelve year exemption is available if 20% of the multi-family units qualify as low or moderate income housing. Applying the state's definition of rental rates that qualify as low and moderate income housing results in rental rates that are very close to current market rates.

Dick Pokornowski asked if the developer would be able to move forward in the event that Council was not willing to approve the request for tax exemption.

Elie stated that the abatement would be a critical element of project funding. At this time, the intention is to submit permit applications in June. If the exemption is not granted, construction will be put on hold until financing options improve.

Paul stated that the Tax Exemption revisions should be approved by Council before the permit application deadline for an October construction date.

Ward Cook asked what materials would be used on the exterior of the building.
Elie stated that they would be utilizing a combination on brick on the ground floor and cement board or stucco on the upper levels.

Jack Onder asked for reassurance that the retail component would effectively activate the street, as mandated by the VCCV.

Paul stated that code does require commercial use on the ground floor and assured the board that further discussion regarding the live/work concepts ability to do that would take place. Lewis acknowledged that while the experience with this concept on upper Main has been positive, it does not generate a considerable amount of traffic.

Jack Onder asked staff to clarify context of the motion before moving forward with approval.

B-003-001 Paul Lewis stated that staff was seeking the board's concurrence on proposed amendments to the development agreement only. The body's recommendation to Council would serve as an endorsement for their consideration and formal action.

Jack stated that while he encouraged the developer to move forward, he was not comfortable recommending the project as a whole.

Paul reminded board members that the development agreement itself does not dictate design or specific elements of the project, but rather provides a broad framework within which the development can proceed.

Richard Keller asked if a final design would be brought to the board for approval at a later date.

Paul Lewis stated that design recommendations from the CCRA board are not required for private development projects to move forward.

Richard Keller stated that most of the developments the board has recommended have provided a design element for their consideration.

Paul stated that the project would be coming back to the board on May 19 for further discussion of the Multi-Family Tax Exemption. Members will be provided with additional information regarding financing and return on investment opportunities at that meeting. An additional work session to address specific elements of the project and design options will also be scheduled.

Lewis reminded board members that the proposed development does not fit within the current agreement and will not move forward without approval of the proposed revisions.

Jack stated that he would approve the proposed changes, but was not prepared to make a positive recommendation regarding design or inferred development.

MOTION MADE BY DICK POKORNOWSKI, SECONDED BY RICHARD KELLER AND PASSED UNANIMOUSLY TO APPROVE PROPOSED REVISIONS TO THE PRESTIGE PLAZA DEVELOPMENT AGREEMENT APPROVED IN 2008.

COLUMBIA RIVER CROSSING DISCUSSION

Paul Lewis directed board members to their packets and called attention to a Summary Statement regarding the Park and Ride facility being proposed at Columbia & 5th Street. Lewis reminded board members that Ward Cook, Dick Pokornowski and Marc Fazio have been serving on a Columbia River Crossing (CRC) subcommittee of the CCRA for the past month.

Transportation Director, Thayer Rorabaugh and Long Range Planning Manager, Matt Ransom have attended each of the meetings. CRC project staff member Wes King has also participated in the ongoing discussion.

Lewis reminded board members that this group has been charged with reviewing design elements and development concerns specific to the proposed structure. A revision of the CCRA's October 2010 letter to Mayor Leavitt regarding this same topic will also be provided by the committee.

Dick Pokornowski stated that the Summary clearly outlines the committee's conclusions regarding the type of facility that should be constructed at this location if mandated by the Federal government as a required element of the CRC project. Subcommittee members agree that the proposed design does not compliment its neighboring surroundings, provide opportunities for future revenue or appropriately reflect the overall vision for downtown.

Ward Cook noted that the committee is proposing a parking structure be placed underground to encourage activity at street level.

Richard Keller suggested that the statement regarding incompatibility with surrounding architecture be strengthened, noting both aesthetic and functional deficiencies.

Dick Pokornowski stated that the committee's proposal of an underground structure would be offered as a form of compromise and formal acknowledgement that a parking facility at this location is not desired by the community. He noted that an underground structure would provide multiple

B-003-001 advantages and opportunities that will be missed if the proposed facility were constructed. The footprint of a below grade facility could be expanded beneath Lightrail to increase capacity without creating a dead street.

Paul offered that the committee has consulted with several members of the development community. It was suggested that residential may be a good use for the upper floors of this site, with smaller professional offices to occupy the ground floor, versus retail.

Ward reminded board members that the purpose of the Summary was to provide the City Council and project staff with a formal statement on behalf of the board that would clearly outline its opposition to construction of the structure as proposed at 5th / Columbia.

Richard Keller asked if there were any way to insist that the project return to the community in some capacity for approval of the design.

Paul stated that while the City has very limited jurisdiction with regard to the overall project, it does have a vote on the Project Sponsors Council. This Summary Statement provides a formal opportunity to raise the profile of this issue.

Ward Cook asked staff to strengthen the reference to underground parking as the preferred option and incorporate a statement that recognizes this site as a formal gateway to the City of Vancouver and state of Washington.

Paul agreed to incorporate the suggested changes and provide a revised Summary Statement to the subcommittee for review.

MOTION MADE BY DICK POKORNOWSKI, SECONDED BY JACK ONDER AND PASSED UNANIMOUSLY TO APPROVE THE 5Th /COLUMBIA PARK & RIDE SUMMARY STATEMENT WITH SUGGESTED CHANGES AND FORWARD TO CITY COUNCIL, CRC PROJECT STAFF, C-TRAN.

NEXT MEETING

There being no other business, the meeting was adjourned at 1:25pm

The next meeting is May 19, 2011

Approved:

_____
Ward Cook, President

Attachment E

Historic Lucky Lager Warehouse Building Economic Value



The Historic Lucky Lager Warehouse Building
An Economic Benefit to Downtown

B-003-001

1. The Building is a Magnet for Downtown Jobs

The Historic Lucky Lager Warehouse building has a history of attracting highly creative and innovative businesses downtown – the very type of businesses that hold promise for the City's future economic growth. The building is similar to many in Portland's very successful Pearl District, where historic buildings have been modernized for the needs of today's tenants.

In the past five years, the unique character of this building has attracted the following tenants:

- Logic Product Development – Vancouver office of innovative Minneapolis company with offices nationwide, providing product design, development, and engineering to manufacturing services
- High Tech Manufacturing Services (HTMS) – Administrative office of firm providing precision machine part manufacturing to order and for new product prototypes, with customers including Hewlett Packard and SEH
- Columbia Energy Partners – Company specializing in renewable energy projects, particularly wind energy development in the Northwest
- Neenan Archistruction – Vancouver office of innovative Colorado design-build company with focus on medical facilities (have built most of the Vancouver Clinics in the area)
- Gravitate Design Studio – West coast office of national website design and marketing company
- Panther Systems, Inc. – national leader in process automation and information technology

2. The Fact That the Building is Fully Occupied Points to Its Appeal

The building is one of the few that is completely (100%) occupied at a time when downtown Vancouver vacancy rates are one of the highest in the Portland Metropolitan area, averaging about 15 percent.

Currently 80 people work in the Historic Lucky Lager Warehouse Building. 15 separate businesses call it home.

3. Here is What Vancouver's Mayor Levitt Said About the Building

In April 2010, the Intertwine held their spring event in our building. The 80 attendees included a number of government officials, including Mayor Leavitt. Here is what Mayor Leavitt told the audience:

> "This is a wonderful space; I'm very envious of this space. Being an engineer, the spot I work in isn't quite as beautiful as this so I might be coming looking for a job."

215 W. 4TH STREET, SUITE 200 VANCOUVER, WA 98660 ▪ 360.600.7094

Attachment F

Advisory Group Member Supporting Letters

B-003-001

203 West 34th Street
Vancouver WA 98660-1908
October 19, 2011

To: Whom It May Concern
RE: CRC-FEIS comments (Columbia River Crossing-Final Environmental Impact Statement)

I oppose the taking of the Wallis Engineering building for the south-most parking garage, as specified in the FEIS.

I served as a member of the CRC-VTAC (Vancouver Transit Advisory Committee) and alternate on the VWG (Vancouver Working Group). When the VTAC began, plans presented showed the south-most parking garage inside the SR-14 to I-5 cloverleaf, on land already off the tax rolls. Months later, the plans changed suddenly to show it on the now partly vacant "auto dealer" lot east of Columbia and south of 5th. Then, at a subsequent meeting, its footprint expanded to include the block housing Wallis Engineering. The records show one objecting comment to removing these lots from the tax rolls, but the Committee was never asked for input on this, nor were the changes fully explained. VTAC and VWG had no self-selected leadership; agendas were controlled by staff.

The Wallis Engineering building is a historic structure, and I believe it is recognized by the county and/or state as a historic building. It has served a vital function as a business incubator for many small entities, recently including Vancouver Food Cooperative. The FEIS proposal would replace this beautiful historic building paying property tax with an outsized unsightly government-owned garage.

I'd hate to have the CRC proposal or public vote opposed because of this provision; small in terms of the CRC project, but tragic in its ramifications for this now nice mini-neighborhood. Consider how ugly a block in that part of town between 5th and the River could easily be.

If the rationale is, as has been stated, to preserve hotel views when the hotel paid for no such provisions, this is improper bias in favor of one business and against others.

Sincerely,

Kenneth M. Becker

B-003-001

700 Washington Street Unit 927
Vancouver Washington 98660
October 20, 2011

TO: Whom It May Concern
RE: CRC-FEIS (Columbia River Crossing- Final Environmental Impact Statement)

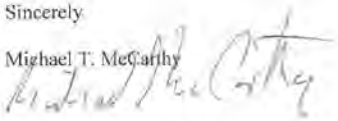
I served as a member of the CRC VTAC (Vancouver Transit Advisory Committee) and on the VWG (Vancouver Working Group). During the initial work of CRC VTAC a good deal of effort was expended to develop guiding principles. One of these was intended to protect existing businesses, if at all possible, in the development of light rail alignments and related facilities such as parking lots and rail stations. The light rail alignment options included details about all possible takings and played a significant role in the ultimate decision making. At this stage the related facilities were conceptual in nature and lacked supporting takings detail.

In fact, the VWG was formed to provide a review of more detailed options for the sizing and placement of the stations and park and rides. As a member representing the Esther Short Neighbor Association, I was particularly focused on mitigating the impact of the light rail investments to at least complement if not improve downtown pedestrian movements and encourage existing investments as well as look to the future. Because of the riverfront potential and the location of the fifth street rail station I favored the movement of the park & ride from under the new bridge and highway 14 connections to a location adjacent to the Hilton. This had the potential to further downtown investments and serve as an attractive gateway. In my opinion details related to sizing of the structure and its related takings were not provided to the VWG. CRC staff and their consultants were tasked with looking at the details of this conceptual solution.

Today, it appears that the Wallis building will be destroyed to make room for the parking garage a direct violation of one of our guiding principles. I am not comfortable that all options have been explored and would request that the process for placement and development of the parking garage continue with every effort expended to support an existing business with historical value. In order to ensure this effort, one that will require the expenditure of resources, I believe ROD should include this as a requirement for the CRC project's future efforts.

Sincerely

Michael T. McCarthy



B-003-001

500 Broadway St. Ste 603
Vancouver, WA 98660
21 Oct 2011

To Whom it May Concern:

I was a member of the VWG that made recommendations on light rail alignment and station and parking structure locations. I was also a member of VTAC saw various design concepts for stations and parking structures. The primary role of the VTAC was to provide input on the aesthetics for parking structures and transit stations.

The Columbia parking structure was originally going to be located inside the circular on ramp from SR 14 to I-5 SB. Then it was relocated to the block bounded by 4th - 5th - Washington - Columbia. Following a review by the Downtown Redevelopment Authority the conceptual design for parking structure was revised again. This third concept was briefly reviewed in our May 2011 meeting but there was little or no discussion of the impact on the property to the south. Most of our time was spent on the transit stations - what they looked like and how to harden them to maximize fare collections. We never got into details about property acquisition nor were we asked to make recommendations regarding them as this was not the work of this committee.

Well after our May meeting, I was surprised to learn that the third concept for the parking structure and a nearby roundabout required the taking of property in the block bounded by 3rd - 4th - Washington - Columbia. This area includes the recently renovated, historic Lucky Lager warehouse. Its heart breaking to think that this property will be a casualty of the CRC project. I feel great sympathy for Bob & Gill Wallis who find themselves in this situation and hope that something can be done to fairly mitigate their concerns.

Sincerely,

Lee Coulthard
360.750.8907 H
360.607.4224 C

Attachment G

DEIS Chapter 22 – Description of Alternatives, page 2-34

Exhibit 2.3-16
Minimum Operable Segment (MOS) Options



DIMENSIONS ARE APPROXIMATE.

The Clark College MOS would include the same three-level parking structure at Clark College as the Kiggins Bowl terminus. Local buses could carry passengers from a surface lot at Kiggins Bowl to the Mill Plain transit station. The terminus station could be between the park and ride and the highway, as indicated in the graphics, or it could be parallel to McLoughlin, either in the middle or to the side of the street.

Mill Plain Minimum Operable Segment

The Mill Plain District MOS would end the transit guideway at the new Mill Plain station between 15th and 16th Streets and between Washington and Main Streets, and could serve as a shortened version of either the Kiggins Bowl terminus or the Lincoln terminus. Future projects could extend the transit guideway to either full-length terminus.

This terminus option would include a Park and Ride structure one block north of the Mill Plain Station, as well as additional Park and Ride surface lots around the SR 14 interchange. Additional Park and Rides at Clark College, Lincoln, and Kiggins Bowl would be connected to the HCT guideway by local bus routes.

Transit Alignment Options

This section describes, from south to north, the transit alignment options that are available for each of the four terminus options. Three segments, or geographic sub-areas, of the project area are defined by discrete sets of transit alignment options in each:

- Segment from Delta Park to downtown Vancouver,
- Segment from downtown Vancouver to the Mill Plain District, and
- Segment from the Mill Plain District through North Vancouver.

Any alignment option in one segment can be matched to any alignment option in another segment. The same terminus and alignment options, as well as station locations, are being evaluated for light rail and bus rapid transit.

DELTA PARK TO DOWNTOWN VANCOUVER

The transit guideway would start at the existing Expo Center MAX station. The light rail component would extend the existing tracks. Bus rapid transit would entail building bus bays and other modifications for a bus transfer center and a new bus-only guideway north from the Expo

Attachment H

FEIS Chapter 2 – Description of Alternatives, Park and Rides, pages 2-26 to 2-27

EAST-WEST LIGHT RAIL ALIGNMENT AND TERMINUS STATION

Both north and southbound alignments of the couplet would become a two-way guideway traveling east-west on 17th Street. The double-track, center-running guideway on 17th Street would run until G Street, then curve north to McLoughlin Boulevard, and then continue east through the existing underpass beneath I-5. The underpass would be widened and the road bed lowered to accommodate the light rail trains and overhead catenary system. The guideway would end at a station and park and ride structure east of I-5, on the western boundary of Clark College and across from the Marshall Community Center, Luepke Senior Center, and Marshall Park.

Park and Rides

Three park and rides would be built in Vancouver along the light rail transit alignment (Exhibit 2.2-18).

Exhibit 2.2-18
Proposed Park and Rides Included in the LPA

	Columbia Park and Ride	Mill Park and Ride	Clark Park and Ride
Site Location	West side of Washington Street between 4th and 5th Streets	East side of Washington Street from 15th to 16th Streets	Northeast of McLoughlin Boulevard and I-5
Size (parking spaces)	570	420	1910
Number of Levels	5	4	5
Footprint (SF)	50,000	42,000	128,000
Retail Space Included Inside Structure	Yes	Yes	No

COLUMBIA PARK AND RIDE

A park and ride would be bounded by Washington, Columbia, and 5th Streets, and half the block between 3rd and 4th Streets. This facility would have five floors above ground and would contain approximately 570 parking spaces (Exhibit 2.2-19). Active uses would be included on the ground floor.

MILL PARK AND RIDE

A smaller park and ride would be built in the block surrounded by Washington and Main Streets and 15th and 16th Streets (Exhibit 2.2-20). This facility would have four floors, with active use space (which could include retail) on the ground floor. The current design includes 420 parking spaces.

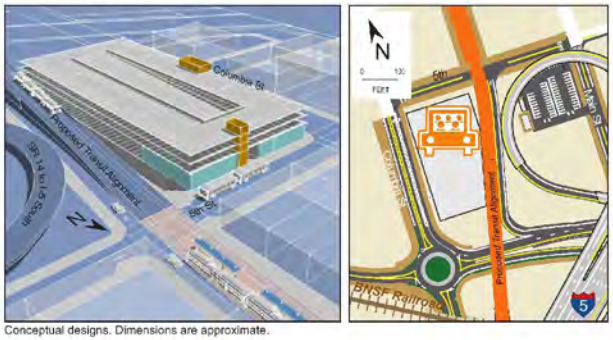
CLARK PARK AND RIDE

The largest park and ride would be built at the Clark College terminus. This facility would have five floors, and contain approximately 1,910 parking spaces (Exhibit 2.2-21).

Ruby Junction Maintenance Facility Expansion

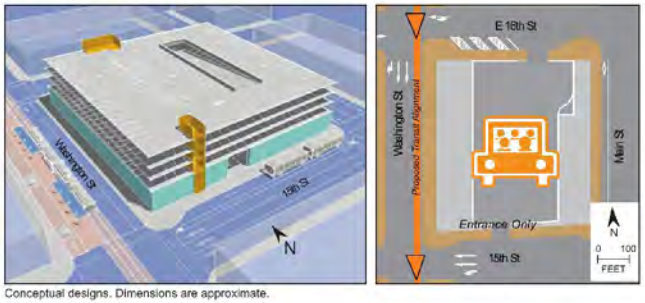
The CRC project would expand the existing Ruby Junction Maintenance Facility in Gresham, Oregon to accommodate the additional LRVs associated

Exhibit 2.2-19
Columbia Park and Ride



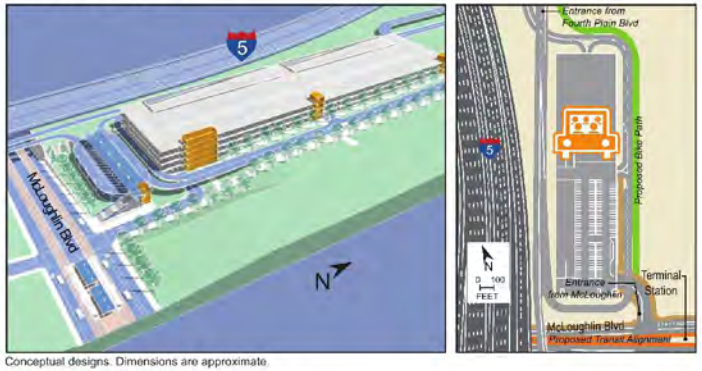
Conceptual designs. Dimensions are approximate.

Exhibit 2.2-20
Mill Park and Ride



Conceptual designs. Dimensions are approximate.

Exhibit 2.2-21
Clark Park and Ride



Conceptual designs. Dimensions are approximate.

Attachment I

Historic Lucky Lager Warehouse Building Historical Analysis,
Eric Eisemann, University of Oregon Adjunct Professor in the Master's Program in Historic Preservation

[Note that in this document, the building is referred to as the "Henkel" building, the original owner and builder)

B-003-001

Narrative Description

215 W 4th Street is an excellent example of early 20th century commerce and commercial architecture in downtown Vancouver. It is a two story concrete building, designed and built in a restrained commercial style that rests on a 0.28 acre parcel at the southeast corner of SW 4th St and SW Columbia Street. It is rectangular in shape, measuring approximately 100 feet x 110 feet and contains approximately 12,179 square feet within its walls. The pitched roof, built in two sections, runs south to north with a stepped parapet wall on the north façade, the building's primary facade.

The ground floor of the north façade contains five (5) large storefront windows, a central access way and one (1) garage door. The upper story is a segmented stepped parapet wall with six (6) window openings measuring 4 feet x 6 feet. The Columbia Street façade contains a bank of large storefront windows and two (2) pedestrian access ways, one in the center of the wall and the second at the south end. The second story contains four (4) window openings. A recessed rectangular sign panel running the length of the building separates the first and second stories on the north and west facades. The south façade abuts a parking lot and contains a ground floor access and two upper story windows. The east façade abuts an adjacent commercial building.

The earliest photographic evidence of the building found to date is from 1964. The photograph of the north façade shows that the second story windows are unchanged from 1964 to present day. In 1964 the wall openings on the north façade were in the present location but they are partially filled. A multi-pane transom light is visible above the filled storefront windows on the north and partial west facades. The style of the transom lights suggests an early 20th century design. In 1967 the window fill material was removed and the storefront windows were opened to their present configuration and style. The recessed sign panel is visible on the north and west facades in the 1964 and 1967 historic photographs and remains intact today. The photographic evidence and building permit research suggests that today the two primary elevations, the north and west facades, are closer to their original configuration and design.

The ground floor interior of the building is large open space designed originally for commercial and warehouse use. Atop the concrete floor, massive wooden posts and beams support the second story. This support system was clearly designed to carry heavy loads. Clear grain fir posts, measuring 12 inches x 12 inches and 8 inches x 12 inches, resting on concrete piers are spaced in a grid pattern 12 feet on-center running north to south and 20 feet on-center running east to west. The posts support clear grain fir beams measuring 10 inches x 13 inches. The second floor joists are unpainted clear grain fir measuring 3 inches x 11 inches. The floor joists are spaced 8 inches on center and are clearly designed to carry very heavy loads. The second story floor boards are also clear grain fir. The overall visual effect of the massive post and beam construction and tightly spaced exposed wooden floor joists is like a forest and canopy of wood.

The first and second floors were originally connected by a freight elevator and a broad wooden staircase. The stair case is in its original location but was modified in 2004 to meet modern building codes. The second story is an open floor plan reflecting its original use as a storage space. Exposed fir posts, measuring 8 inches x 8 inches and 10 inches x 10 inches, support an exposed roof truss

B-003-001

system. The spans are made of five (5) 2 inch x 10 inch fir boards bolted together; the wooden webbing measures 3 inches x 11 inches; and the chords are solid 12 inches x 12 inches fir lumber. The ceiling rafters measure 3 inches x 11 inches and are spaced 12 inches on-center. Like the ground floor interior, the second story structural system is unpainted wood.

The building was renovated in 2004-2005. The windows voids are unchanged and weatherized glazing was installed. The original interior structural support system is intact. Non-load bearing interior partitions divide the first and second floor interiors but great care was taken to leave the entire wooden structural support system intact and open for viewing. Glazing was installed in two of the roof truss webbings to allow sunlight to flood the upper story work space. The interior staircase is in the original location but was renovated consistent with city building code and ADA standards.

The building has occupied the southeast corner of Columbia and 4th streets for nearly 90 years. During that long period of time the exterior scale, massing and limited ornamentation have changed little. The character defining elements of the interior, the massive wooden support systems is completely intact.

Statement of Significance - In response to criteria:

The W.F. Henkel building is a significant illustration of simple downtown commercial and industrial architecture from the early 20th century. The simplicity of its stripped early modern design and poured concrete construction is a reflection of the desire of Vancouver's World War I era business community to participate in the growth and prosperity of the new 20th century. The emergence of automobile and rapid industrialization are the hallmarks of the early 20th Vancouver and American history and this building is a reminder of the strength and vitality of that era.

1. Association with significant broad patterns or local events. The earliest documentation of a commercial use of the site is the 1888 Sanborn map which identifies a planning mill at this location. The 1889 Polk Directory lists Case Doors and Blinds as the site use and J.P McFarlane and Frank M Davis as the owners. MacFarlane, a Michigan native, formed and operated the Michigan Lumber Company. On June 9, 1902, according to the Landerholm Chronicles, the building burned to the ground at 4:00 AM. Prior to the fire, the building was 'closed due to litigation" and the Michigan Lumber company liquidated its assets to FW Ledbetter and HL Pittock. The 1907 and 1911 Sanborn maps indicate that the property was not in use. The Polk Directories from 1916 – 1919 indicate that 215 W 4th Street was occupied by and Red Front Livery.
   Just as the horse and buggy was replaced by the automobile, so was the livery replaced with a new automotive showroom and repair building. The 1920 county tax records show a $2,500 increase in improved property value on the site over the previous year indicating that the present building was constructed and opened. The property owner was W.F. Hankel. The 1921 Polk Directory contains a listing for the W.F. Hankel & CO – truck Headquarters, Hankel & Company sold and services GMC trucks, Samson tractors and Scripps-Booth Motor Cars out of the ground floor showroom. In addition, Hankel distributed BF Goodrich truck tires, operated a machine shop and, because industrialization and the auto had not completely conquered the area, the company had a blacksmith operation.

B-003-001

The building was clearly designed to house retail in the front (4th Street side) and storage in the back and in the upper story. Large storefront windows face 4th and Columbia streets inviting passers-by to come in and see the latest in modern transportation design. The storage garage door was located at the southern end of the Columbia Street façade and provided direct access to the freight elevator, designed to lift cars, tractors and heavy equipment to over-engineered second story floor.

The 1920s were a boom time in America and in Vancouver as the country and the region reaped the benefits of the economic recovery following the end of World War I. Employment and industrialization were on the rise and in downtown Vancouver "substantial new buildings seemed to rise up like mushrooms after a spring rain". (Bill Alley – History Link – www.historylink.org) W.F. Hankel and Company served the local buying public with the latest in automotive equipment from their new building at 215 W 4th Street for a time. The 1928-1929 Polk Directory shows Lineman Motors and Automotive Dealers operated out of the building.

The effects of the great economic contraction of 1929 are reflected in the use of this building. As money became tighter people turned from purchasing large consumer goods, such as automobiles and tractors, to filling more basic needs – buying food. In 1929 Western States Grocery Company replaced Lineman Motors and operated out of this building until 1934. Between 1934 and 1938, the depths of the great Depression, Hudson and Duncan Company, another wholesale grocer owned the building. In 1954 "Hudson House" is listed as the owner and occupant on a Vancouver building permit. Hudson House appears as the owner and occupant of the building until 1964.

Beginning in 1956, Hudson House leased warehouse space to the Lucky Lager Brewery of Vancouver, WA. Lucky Lager Brewery opened its downtown Vancouver plant with its iconic red 'Lucky Lager' sign, in 1950. Lucky Lager and its parent General Brewing Company operated brewing plants in Azusa, California, Salt lake City, Utah and Vancouver, WA. During the 1950s and early 1960s Lucky Lager was the beer sales leader in the Western United States. [1] The building at 215 W. 4th Street City of Vancouver permits show that Lucky Lager continued to lease warehouse space in this building through 1972. Lucky Lager closed its Vancouver operations in 1985. 215 W. 4th Street was one of the original Lucky Lager warehouses and perhaps the last to close down.

From 1964 through 1979, Grover's Electric occupied the building ground floor as a retail sales shop and equipment storage area. Historic photographs from 1964 and 1967 show that Grover Electric may be responsible fro removing the bricks from the storefront windows as well as interior electrical and plumbing improvements. Brian Hall Pro Caliber Motor Sports occupied the ground floor from 1994 – 2007. Wallis Engineering is the current owner and has made a significant investment in renovating the building in keeping with its original character.

[1] "Eugene Selvage Retires as President of Lucky Lager." Humboldt Standard 03 March 1961: Pg 9.

B-003-001

2. Distinctive architectural characteristics. The building, as built by W. F. Hankel in 1920 and seen today, is an excellent example of function over form and style. The building was designed and built in the post WWI era as America and Vancouver built an automobile driven society. The building was designed with large ground floor showroom windows so that passers-by, whether walking or driving, could steal a glance into the auto showroom to see the latest transportation marvel. The building is striped of all ornamentation except for the stepped parapet wall in the primary façade on facing 4th street. Concrete is the medium of choice for the exterior walls. The large garage door on the Columba Street side allowed easy access into the storage area and a heavy-duty freight elevator the dealer to over merchandize easily between floors. The rectangular second story windows are simple openings whose purpose is to illuminate the second story not to add embellishment or architectural interest. The character defining elements of the building are its simple exterior form, open floor plan, and oversized wooden support system. Every element is designed to enhance the function of the building, i.e., to showcase merchandise and facilitate its interior movement and storage.

3. Reflects elements of the county's history. In the early 20th century, nearly every small American city reinvented itself and learned to accommodate and embrace the transformation into the auto and modern industrial era. The W.F. Hankel building is such a place where downtown Vancouver embraced the modern era and moved from Red Front Livery Stable to automobile sales and service. When the county economy staggered badly in 1929, the building accommodated the changing market demands and switched from auto sales to wholesale grocery sales. When Lucky Lager opened its brewery plant in downtown Vancouver, the building at 215 W 4th Street offered its super-engineered second story as a convenient brewery warehouse. Lucky Lager closed its Vancouver plant and nearly all evidence of its iconic presence in downtown Vancouver is gone except, perhaps, for the building t 215 W 4th Street. As downtown Vancouver is experiencing a rebirth of commerce while American and the region embrace green technology. Today, a local engineering firm has carefully renovated the buildings interior and exterior character defining elements while installing the modern green technology elements of interior design. As always, 215 W 4th Street has managed to keep pace with the changing commercial times.

Hines, Maurice

From: Newt Rumble [Newt@vancouvercpa.com]
Sent: Friday, October 21, 2011 6:18 PM
To: Columbia River Crossing
Subject: Concerns about CRC FEIS - Draft comments

B-004-001

I am opposed to this project on many fronts. I have not always had such concerns, and have been following it from inception. However, in the last 9 months the plethora of information which has been released following various FOIA requests has caused me to be in opposition.

There is no doubt that this geographic region has serious transportation impediments related to an overcrowded I-5 traffic corridor. This has negatively affected commerce, and economic development in the area. It also places the area at risk in the event of natural disaster and/or security concerns.

However, this CRC project, clearly, will not solve any of these concerns – except for the construction of a crossing that is more seismically protected. A simple review of the information considered by the planning council and sponsor agencies, and the information provided by selected and highly compromised project managers and vendors demonstrates that the CRC project will not improve daily traffic flows north and south bound between the Portland metro area and Clark County, let alone to the greater SW Washington area. The historic connections between area transportation agencies and municipalities with the Project Contractor and Manager (David Evans and Associates) raises concerns about independence, oversight, predetermined selection and design review processes, conflict of interest, management effectiveness, and cost control.

B-004-002

The project activity to date has been highly mismanaged and characterized by a lack of transparency, with various community and elected officials being spoon fed selective information to insure decision making consistent with the interests of the contractors, agencies and their staff, and perhaps even certain private parties. There are instances, involving significant amounts of money, where Contractor David Evans and Associates engaged entities who were already under separate contract to the project to perform services, which were then billed back to the CRC project and then subject to a 4% profit markup by DEA.

Data in conflict with the planning agencies and managers predetermined goals has been ignored, misinterpreted, and/or miscommunicated in efforts to create a "need" for all aspects of the project, including light rail.

B-004-003

The CRC project, as part of its federal funding mandate, required consensus among the sponsor agencies throughout the planning phase as a prerequisite to major design and planning conclusions. In the absence of

1

B-004-001

The independently validated results of the project traffic modeling show clear improvements in travel time, congestion relief, auto emissions, and safety. Please see Section 3.1 for details.

B-004-002

The NEPA process has considered all relevant and available information regarding alternatives and impacts.

Effective and fair program and agency management and decision-making are critically important, but they are not appropriate issues to be evaluated in the environmental review and NEPA process. If you have specific concerns about these issues please contact WSDOT directly.

B-004-003

See the response to comment B-004-002 above. The FEIS describes the rationale for, and benefits from, including light rail transit (see Chapter 2 and Section 3.1 in particular).

B-004-003 specific leadership, this consensus requirement has allowed individual agencies to hold the project design and planning "hostage" to their various special interests, in spite of questionable cost/benefit considerations to the other agencies and the general public. Most notably this would be applied to the decision to add light rail to the project – a concept ostensibly sold as a requirement of federal funding; but in truth a requirement only of sponsor agency Metro, but used in the construct of the consensus mandate, it appears instead as a federal mandate.

B-004-004 The funding resources to pay for the construction, including tolling projections were understated and undisclosed, creating a perception of purposeful obfuscation to avoid the negative backlash that would occur and which might cause the CRC project's viability to be questioned.

B-004-005 This region has known for more than 30 years that most viable solution to the I-5 congestion problem follows the "Western Bypass" concept. The "Western" solution solves numerous environmental, social, economic, and logistical concerns raised in the current project, for significantly less and more predictable costs. Yet, it is routinely disregarded, and was in this case, because it had little direct benefit to certain agencies, most notably the Portland Bureau of Transportation and the Portland Bureau of Planning and Sustainability. Both of these agencies input is tainted by decisions and efforts within the project to increase urban densification and mass transit – in spite of a plethora of research nationwide and internationally that show that both efforts increase transportation costs, housing costs, and are characterized by an underutilization of mass transit. The "Western" route would open up commercial and industrial development along I-5 from Ridgefield to Kalama, an area with economic and practical availability of land, labor, community resources and a labor force characterized by high under-employment and unemployment.

B-004-006 The project is characterized by no single project leader, which has led to huge cost over runs, or underestimations of minimally necessary costs from inception. However, information from the project seems to indicate such understatements are part of a "palatability" rinse of the project to insure it's acceptance by the general public and to keep the true cost and mismanagement of the project from public scrutiny. The project's fiscal controls and accountability do not begin to approach even the lowest standard applied to federal grants as established by PL 104-156. This standard, affecting the audits of States, local governments, and non-profit organizations expending Federal funds, describes accountability and controls that are minimally acceptable in order for the financial transactions of the entity to be audited and receive an opinion that the entity and its financial operations are stated in such a manner as to be materially accurate, and the operations that produced the transactions are managed, with suitable oversight so as to be materially free of risk of misstatement, error, or malfeasance. The project has no single entity that has taken the responsibility for managing and/or reporting to the public on the sources and

2

B-004-004

Please refer to Chapter 4 of the FEIS for a description of the current plans for funding construction and operation of the LPA. This discussion provides an updated assessment of likely funding sources for this project. As described in the FEIS, project funding is expected to come from a variety of local, state, and federal sources, with federal funding and tolls providing substantial revenue for the construction.

The project has not attempted to minimize the costs of the project. In fact, there are many estimations, such as property acquisitions, that have been made rather conservatively. There are a number of properties that the project will work to avoid or minimize impacts to. Some of these properties, because we are uncertain if we will be able to avoid them as design advances, are shown as displacements in the FEIS and included in acquisition cost estimating.

Governors Kitzhaber and Gregoire, and Oregon and Washington legislators have made it clear that they will review every element of this project and provide oversight and accountability. The governors and legislative leaders are discussing the scope of interim legislative oversight committees. At Governor Kitzhaber's request, the Oregon State Treasurer conducted an independent review of the CRC's financing plan and released a report in July 2011. CRC incorporated the treasurer's recommendation in Chapter 4 of the Final EIS.

B-004-005

New corridors, including a "western bypass", were among ideas and proposals evaluated early in the CRC development process, as discussed in Section 2.7 of the FEIS.

B-004-006

The project is currently undertaking an audit, which is being conducted in addition to the normal and customary financial controls for a project of

B-004-006 uses of nearly $155 million of public funds, in spite of the fact that the total expenditure includes over $90 million expended to David Evans and Associates, which is about 80% more than the amount of their original contract. Indeed, the coordinating organization, the Columbia River Crossing Project office asserts that they and the agencies have no requirement for accountability because the area "project office" is not a reporting entity. The extreme shallowness of such an attitude should play havoc with every citizen's faith in the role of governance. In every instance of major construction project conception – from project owner to contractor management to project supervision, yea even to task supervision – accountability and fiscal reporting is the industry standard for ensuring project timeliness and profitability and cost effectiveness. There simply are no exceptions! At least none that would stand the test of scrutiny! The tragedy in such a comment is that it displays the reckless spending and casual ownership that is far too often taken for granted by public sector employees with regard to their responsibility to their "shareholders", i.e. the taxpaying public.

To conclude:

B-004-007
- The region needs an additional interstate commerce byway to improve transportation flow in the area.
- Whether by "Western Route" or "Eastern Route" (a more short sighted concept than the former), either would be more practically and economically palatable to the congestion problem faced on the existing connection or a successor at the same site.
- Under any alternative, there is no doubt that the I-5 bridge needs to be replaced and likely expanded, along with design corrections to a hodge podge of freeway access points that have been cobbled together over a 60 year period along the crowded Portland metro corridor.
- The present CRC project barely accomplishes the replacement need, without addressing the transportation and congestion and economic development components, at an extremely high price; and leaves the region continually vulnerable to the problems of limited crossing alternatives in a metropolitan area of 2.7 million people.

B-004-008
- The existing CRC project as outlined in the FEIS is driven outside of reasonable financing boundaries by design flaws, and project add ins, like light rail

B-004-009
- The SW Washington area has repeatedly rebuffed light rail proposals for the area. It is time to take this issue off the table, and give the people what they need, and have expressed as "what they want" – or don't – as the case may be.
- The people of SW Washington do not want urban densification, do not want time consuming and expensive transportation alternatives, and do want a system that will improve the flow of commerce up and down the greater west coast interstate highway system.

Sincerely,

3

this type. Inquiries about particular financial issues should be sent to the project office. The expenditures to date are generally in line with a project of this size. The project has managed to reach agreement on many issues among many jurisdictions. Additionally, the project has nearly completed the NEPA environmental analysis, has reached nearly 30% design, has conducted an extremely thorough outreach effort, and has completed considerable geotechnical and other pre-construction testing. WSDOT and other sponsoring agencies have taken financial accountability very seriously and do have the records of such management. The joint management structure has actually been a cost saving measure rather than an effort to obfuscate spending.

B-004-007

Mr. Rumble comments that the I-5 CRC project alone is not enough to solve a number of regional transportation and other needs. This is acknowledged. The CRC project is intended to address the specific needs identified for this portion of the corridor and region, as described in Chapter 1 of the FEIS. It addresses these needs and has independent utility, but it does not address other transportation needs in the region.

B-004-008

The project has worked with local decision makers to balance the need to reduce costs and yet provide a comprehensive solution. Light Rail is a critically important part of the project, supported by all local agencies, and by locally adopted plans.

B-004-009

Light rail has been endorsed by every local Sponsoring Agency (Vancouver City Council, C-TRAN, RTC, Portland City Council, TriMet, and Metro), whose boards include elected leadership from throughout the area.

Newt Rumble, CPA
Peterson & Associates, P.S., CPA's
P.O. Box 65009
7919 NE Hazel Dell Avenue
Vancouver, Wash. 98665-0001
phone: 360-574-0644 fax: 360-573-4499

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4

Annual light rail passenger trips crossing the I-5 bridge in 2030 are projected to be 6.1 million, with daily ridership around 18,700. The travel time for the morning commute by light rail between downtown Vancouver and Pioneer Square in downtown Portland will be approximately 34 minutes. Light rail would travel on a dedicated right-of-way, with more reliable travel times than auto drivers dealing with unpredictable road conditions, traffic congestion, and parking challenges.

The CRC project planning for light rail incorporates and supports the principles of the Vancouver's City Center Vision Plan. Downtown Vancouver has seen recent growth in higher density mixed use projects from three to 12 stories in height. In addition, another 4,000 downtown condominiums are proposed or pending as part of new developments. The core of Vancouver has, along with many of the larger corridors such as Fourth Plain Blvd, medium to high density residential development and an urban mix of uses. Transit demand in these areas is quite high, and ridership will increase with the introduction of light rail.

Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on having a public vote.
The ability to efficiently move freight in the Vancouver/Portland region is critical to the overall health of our economy. As such, the CRC project is designed to improve freight mobility on I-5, as well as make it safer and easier for trucks to get on and off I-5 to reach businesses and Port facilities. The Freight Working Group (FWG), comprised of representatives of the Vancouver-Portland metropolitan area's freight industry, met 22 times throughout the DEIS and FEIS development process to advise and inform the Columbia River Crossing project team about freight issues. The group provided insight, observation, and recommendation about the needs for truck access and mobility within the corridor; characterized the horizontal and vertical clearances, acceleration/deceleration, and stopping performance needs of trucks that

must be accommodated; and provided meaningful comments on the effect of geometric, regulatory, and capacity changes on truck movements in the corridor. See Chapter 3 (Section 3.1) of the FEIS for detailed discussion of how the project increases freight mobility and access along I-5 and in the region.

JUBITZ CORPORATION

RECEIVED
OCT. 14 2011
Columbia River Crossing

October 13, 2011

Columbia River Crossing Project
700 Washington Street
Suite 300
Vancouver, WA 98660
Attn.: Heather Wills, CRC Environmental Manager

Re: Columbia River Crossing (CRC) Project EIS

Dear Ms. Wills:

B-005-001

Following is written comment from Jubitz Corporation ("Jubitz") with respect to the replacement of the I-5 Columbia River Bridge project ("Project") and the Final Environmental Impact Statement (EIS) published September 23, 2011. Our comments are timely within the 30-day review/comment period, and refer specifically to proposed highway improvements in North Portland associated with the Project, to wit: the proposed Martin Luther King Blvd. ("MLK") off-ramp connection to N.E. Union Court/Union Court.

Background.

Since 1958, Jubitz Corporation has operated a truck stop at the Jubitz Travel Center located at 10210 N. Vancouver Way. Our present facility covers 24 acres, generally serving 1000(+) trucks per day. The bulk of our over-the-road highway traffic comes from the I-5 freeway, with additional material daily truck traffic from the Port of Portland loading areas West of I-5. Other trucking companies in our immediate vicinity which also produce large I-5 truck traffic counts are Market Transport (110 N. Marine Drive), Haney Truck Line (10505 NE 2nd Avenue) and USF Reddaway (10510 N. Vancouver Way).

Jubitz is generally in support of the CRC bridge replacement as presently designed. The bridge replacement should help alleviate the current congestion in the I-5 bridge vicinity, and will facilitate commercial trucks accessing I-5 from our general area.

Jubitz objects, however, to the current proposed configuration for commercial trucks accessing our facility or other proximate trucking locales from I-5 via Martin Luther King Blvd. ("MLK"). Specifically, the current proposal utilizes an extended loop off-ramp from MLK to connect with N. Hayden Meadows Drive and NE Union Court before passing underneath MLK to connect with N. Vancouver Way. This differs from the earlier MLK off-ramp configuration described by **Option 12 Modified** (see "Marine

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B-005-001

Several designs have been considered for reconfiguring access to I-5, and across I-5, from the east through the Marine Drive interchange area. All of the options have advantages and disadvantages. The project will continue to attempt to minimize adverse impacts to all resources and property owners as much as practicable. We urge Jubitz and other stakeholders to continue to coordinate with ODOT and the project to determine if there are refinements or measures that can be implemented to reduce the impacts Mr. Stibolt outlines in this letter.

There will be additional out-of-direction travel for vehicles from I-5 to Jubitz but the proposed local street network provides good intersection spacing on Vancouver Way which will improve traffic operations. There is no out of direction travel for vehicles destined to the interchange from Jubitz – the distance is virtually the same compared to existing. There is actually some improvement by removing the out of direction loops on the existing northbound entrance ramp. The access between MLK Jr. Blvd and Marine Drive and Vancouver Way is improved by adding acceleration and deceleration length on the connections and appropriate weave distance between the connections and the interchange. The proposed layout simplifies the network by providing better spacing in the connections to redesign the three streets that currently connect near the interchange.

B-005-001

Drive Interchange Alignment Recommendation Process—Final Summary Report and Stakeholder Recommendation" published October 2009, File ID 771). Option 12 Modified utilizes a substantially shorter and simplified MLK off-ramp to connect with Union Court and the N. Vancouver Way area.

Our objections to the current proposal v. Option 12 Modified include the following:

- The current proposed configuration unnecessarily adds 2400 feet (.45 mile) of additional truck driving distance, resulting in increased fuel consumption and costs for each truck exiting I-5 to access Jubitz and other area trucking centers.
- The current proposed configuration unnecessarily results in the emission of additional greenhouse gases due to additional drive distance.

Discussion.

THE PROPOSED CONFIGURATION UNNECESSARILY ADDS 2400 FEET (.45 MILE) OF ADDITIONAL TRUCK DRIVING DISTANCE RESULTING IN INCREASED FUEL CONSUMPTION AND ASSOCIATED COSTS.

Contrary to the Option 12 Modified plan, the proposed MLK off-ramp results on excess fuel consumption due to extended off-ramp distance with resulting costs to commercial trucking. In addition to distance alone, the current configuration adds a third intersection necessitating truck stoppage and starting. Compared to Option 12 Modified, it is estimated that the combination of distance plus additional fuel consumption due to required truck acceleration due to the added intersection may result in up to an additional .17 gallons of fuel burned by each truck utilizing the off-ramp. Positing an average figure of 1000 trucks per day accessing Jubitz plus a conservative estimate of an additional 500 trucks generally accessing other local trucking destinations from I-5, this results in an additional daily consumption of 255 gallons of diesel fuel, or over 93,000 gallons per year. Applying current and anticipated diesel fuel pricing of approximately $4.00/gallon, the proposed configuration results in additional costs of over $370,000 per year to access local truck locations.

THE PROPOSED CONFIGURATION RESULTS IN THE UNNECESSARILY EMISSION OF ADDITIONAL GREENHOUSE GASES DUE TO ADDITIONAL DRIVE DISTANCE.

As described above, utilizing an average figure of 1500 trucks per day, the proposed MLK off-ramp configuration will burn 93,000(+) additional gallons of diesel fuel per year to cover the additional 675 miles (.45 miles x 1500) of off-ramp distance. This results in unnecessary emissions of greenhouse gases otherwise avoided by Option 12 Modified.

B-005-001

October 2009 Marine Drive Interchange Alignment Recommendation.

A review of the October 2009 Recommendation of **Option 12 Modified** includes multiple findings as well as analyses supporting the recommended design. These findings have not been changed, and remain compelling reasons to adopt the Option 12 Modified proposal

Summary.

Discussions with CRC Committee representatives indicate that considerations for the currently-proposed MLK off-ramp configuration include potential interference with a deeded dog park area, visual proximity of the Option 12 Modified N.E. Union Court intersection to Delta Park softball fields, potential close juxtaposition of the Option 12 Modified N.E. Union Court intersection with the (new) N. Vancouver Way intersection,[1] and maximizing the space between the I-5 intersection and a connection with N.E. Union Court. Particularly with respect to the final point, Jubitz believes its above-described objections renders the current proposed off-ramp configuration inferior to the **Option 12 Modified** MLK off-ramp design.

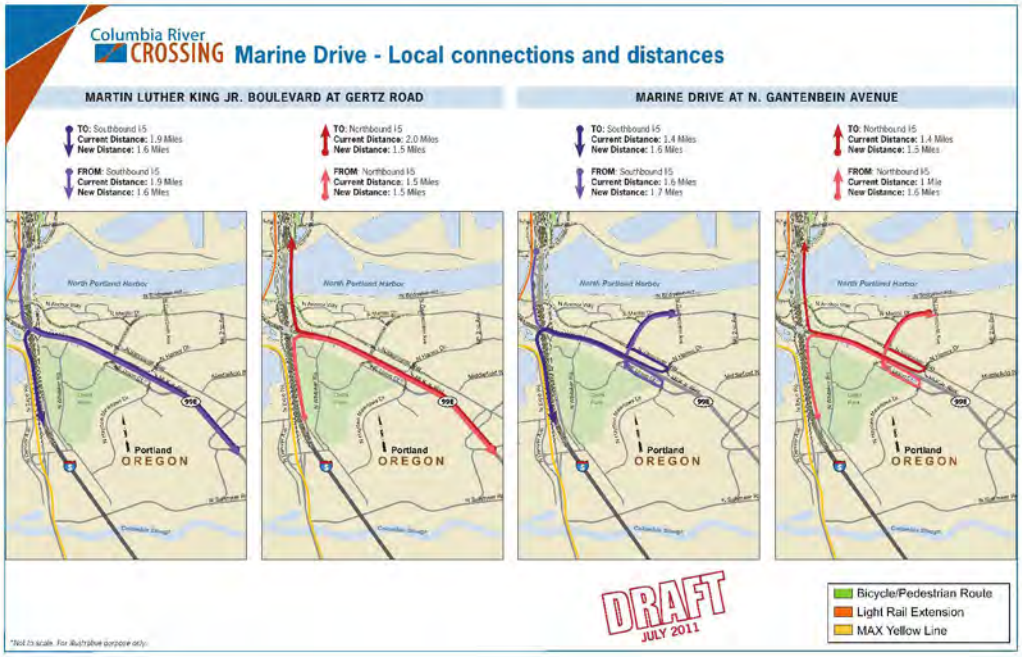
I would appreciate an opportunity to discuss our comment with you.

Sincerely,

Victor D. Stibolt
Vice President Administration & General Counsel
(503.345.0313)

cc: Aaron Myton, P.E., Columbia River Crossing Committee
Gary Wilson, Market Transport
Pat Roetker, Asst. Terminal Manager USF Reddaway
Haney Truck Lines
Corky Collier, Executive Director Columbia Corridor Association

[1] This objection by CRC Committee presumes both intersections will be governed by traffic lights. While a traffic signal will be reasonably required for N. Vancouver Way, the Union Court intersection under Option 12 Modified may well be better served through use of simple stop signs which have adequately served all truck traffic currently accessing N. Vancouver Way from I-5.


Columbia River
CROSSING
Marine Drive - Local connections and distances
MARTIN LUTHER KING JR. BOULEVARD AT GERTZ ROAD
TO: Southbound I-5
Current Distance: 1.9 Miles
New Distance: 1.6 Miles
TO: Northbound I-5
Current Distance: 2.0 Miles
New Distance: 1.5 Miles
FROM: Southbound I-5
Current Distance: 1.9 Miles
New Distance: 1.6 Miles
FROM: Northbound I-5
Current Distance: 1.5 Miles
New Distance: 1.5 Miles
MARINE DRIVE AT N. GANTENBEIN AVENUE
TO: Southbound I-5
Current Distance: 1.4 Miles
New Distance: 1.6 Miles
TO: Northbound I-5
Current Distance: 1.4 Miles
New Distance: 1.5 Miles
FROM: Southbound I-5
Current Distance: 1.6 Miles
New Distance: 1.7 Miles
FROM: Northbound I-5
Current Distance: 1 Mile
New Distance: 1.6 Miles
North Portland Harbor
Portland
OREGON
DRAFT
JULY 2011
Bicycle/Pedestrian Route
Light Rail Extension
MAX Yellow Line

Hines, Maurice

From: Columbia River Crossing
Sent: Monday, October 24, 2011 4:10 PM
To: Columbia River Crossing
Subject: FW: Meeting with Perkins /Coie LLP

From: Gray, Joe
Sent: Monday, October 10, 2011 3:03 PM
To: document.control
Cc: Pressentin, Anne; Palazzo, Mike
Subject: Meeting with Perkins /Coie LLP

Date: 10/10/2011
Time: 10:00am – 11:10am
Location: Offices of Perkins / Coie LLP
Attendees: Steve English, Stephen Pfeiffer and two owners of Buena – Hayden LLC (Did not get the Names of the owners)

B-001-001

Met with the above listed at the Attorneys office of Perkins / Coie LLP today. The meeting was about the potential impacts to the Buena-Hayden properties due to the CRC project. I was asked many different questions about the project and funding related to it. I let them know that the FEIS information was up to date and that was what we were using to identify properties that maybe impacted by the project. The attorneys wanted to know how much money was being spend monthly on the project and I told them that I did not have that information. I was also asked about how many people were employed at the CRC office and I told them I was not sure, but around 40-50 and that changes based on the work needs. The main reason for the meeting was to see when and how much we were going to pay the owners (Buena – Hayden LLC for their property and when were we going to do that. I explained that we were not purchasing any R/W at this time and we were not moving forward with R/W tell after ROD and if we had funding to move forward.

They asked if we would be will to buy the vacant property (Newport Bay) now before they have a new owner or lease it out. They say there is plans to have Denny's move to that location and on the Denny's site place a new Starbucks there. Also they told me that they feel they are Damaged due to the project taking so long. They feel that their properties are not selling or can sell because of the project and no one is will to purchase then have to move due to the project. This has created a hardship for the LLC and the CRC project caused this. The Attorney (Steven English) asked if we were willing to lease or buy the Newport Bay property at this time. I explained the process of this and that I could not answer this at this time, because I needed to know if the project had funding for this type of process. Mr. English told me that they are going to put a proposal to me and want a response quickly on the properties in question. Mr. English stated that he would not like to take action against us, but he feels his clients are damaged and wants to come up with a resolution that helps all of us. I told him to put the proposal together and get it to me and we would look it over and get back to them.

Joseph A. Gray
Right -of- Way Manager
Columbia River Crossing
office: (360) 816-2171
Cell: (360) 601-8991

B-001-001

This comment is a summary of a meeting between the ODOT right-of-way manager and impacted property owners and their representatives. The property owners' concerns will be resolved through the right-of-way acquisitions process, which will meet the requirements of the Uniform Act. Information about expenditures is available by contacting the project office.

DIVERSIFIED MARINE INCORPORATED DMI

P.O. Box 83719 Portland, OR 97283-0719
(503) 289-2669 / FAX 289-2825

October 24, 2011

Columbia River Crossing Project
700 Washington Street, Suite 300
Vancouver, WA 98660

RE: Comment by DMI in response to the FEIS

Dear CRC:

B-002-001 I am a planner representing Diversified Marine, Inc. ("DMI") at 1801 N. Marine Drive, Portland. I am writing to respond to the Final Environmental Impact Statement (FEIS) issued on September 24, 2011.

1. Section 3 of the FEIS states:

> *The information presented in this section [Section 3.3 – Property Acquisitions and Displacements] is based on the analysis described in the CRC Acquisitions Technical Report, included as an electronic appendix to this FEIS.* (p. 3-79)

DMI objected to the Acquisitions Technical Report in our June 23, 2008 letter to the CRC, which is included in the DEIS as comment item number B-059. We continue to make those objections to the Acquisitions Technical Report, because the information in the FEIS does not resolve them.

B-002-002 2. The discussion of information about the North Portland Harbor gathered since the DEIS was published (pp. 3-81 to 3-82) does not include any new information about DMI or other uses on the south side of harbor. It addresses only the floating homes on the north side of the harbor.

However Exhibit 3.3-3 (Figure I, p. 3-86) shows what appears to be acquisition of at least an easement at the east end of the DMI site, with consequential significant impacts to the existing DMI office building. And Exhibit 3.3-4 (Figure F, p. 3-87) shows that the project footprint will include land owned by ODOT and leased to DMI that is critical to parking and storage needs of DMI. Acquisition of ODOT-owned property is discussed in a sidebar on p. 3-90. But its significance to DMI is not considered expressly in the FEIS.

B-002-001

The Acquisitions Technical Report has been updated for the Final Environmental Impact Statement. Please see B-002-002 through B-002-010 below for responses to Mr. Epstein's specific concerns.

B-002-002

The pages you reference (3-81 to 3-82 of the FEIS) are under the header "Existing Conditions" and describe the existing conditions in the project area specific to North Portland Harbor, and are not under the header "New Information Developed Since the Draft EIS."

Exhibit 3.3-3 (Figure I, p. 3-86) illustrates a permanent property easement on the DMI site. This subsurface easement would likely cause the displacement of one structure on the property, as identified in Appendix E "List of Potential Property Acquisitions" on page E-30.

DOT-owned property is intended for transportation-related uses in the long-term, with which the CRC project is compatible.

Representatives of ODOT will work with DMI during the real estate acquisition process to ensure that fair market value compensation will be provided, in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended).

B-002-003

3. There is discussion of permanent subsurface easements for soil stabilization near the Marine Drive interchange. (p. 3-88). Although not discussed there in detail, we understand from discussions with CRC and PDOT staff that soil stabilization is likely to require removal of the existing DMI office building on the east end of our property.

At p. 3-90, the FEIS states that, "[p]roperty used temporarily during construction could be returned to its owner once construction is complete." Reconstruction or replacement of that office in its existing location may not be feasible, because the office now is situated on the harbor dike where the Soil and Water Conservation District would not allow its reconstruction or replacement. This issue is not addressed in the FEIS.

B-002-004

4. At p. 3-93 through 3-95, the FEIS discusses compensation and relocation for permanent property impacts consistent with the federal Uniform Relocation and Real Property Acquisitions Policies Act of 1970. However as pointed out in comment item code B-059, we understand from our lawyers (who are experienced in such matters), that DMI will not be compensated for the following:

(a) The loss of its leased storage and staging yard and off-street parking;
(b) Lost income during the move to and refitting of another site;
(c) The cost of in-water facilities that would have to be abandoned and rebuilt elsewhere;
(d) Disruption to and loss of work during the move;
(e) The cost to obtain permits at the new site; or
(f) The loss of the key technical personnel and physical and proximity relationships on which the business depends.

Although the FEIS discusses compensation for impacts to businesses in the North Portland Harbor, such as DMI, it does not discuss these uncompensated impacts.

B-002-005

5. Section 3 of the FEIS states:

In the Marine Drive interchange area, five marine-related businesses with a total of 25 employees and $10.6 million in annual sales would be displaced under the LPA. These businesses are dependent upon a location close to the river in order to operate. Finding suitable locations for boat sales and a boat dock and repair may be difficult, as much of the Columbia River area in the vicinity of highway access is built up for either residential or industrial/ commercial use. The Oregon Department of Transportation (ODOT) would partner with TriMet to provide relocation assistance to these businesses. (p. 3-107)

All displaced businesses would be offered relocation assistance in accordance with the Uniform Act. Some of these displaced businesses may choose not to relocate locally. Even with relocation assistance, some of the employees may be unable to retain their jobs; for example, an employee may have to accept a new job during the transition period of relocation. (p. 3-107)

B-002-003

As mentioned in the response to B-002-002, a subsurface easement would likely cause the displacement of one structure on the property, which you refer to as the DMI office building.

This easement is designated a permanent easement not a temporary construction easement, therefore, the statement about property temporarily used during construction is not applicable.

With regard to the possibility of reconstructing or replacing the office in the existing location, the FEIS disclosed the impact that a structure would be displaced on the property. Whether or not the structure could be rebuilt in its existing location, or on the property at all, is outside the scope of the NEPA process and would be addressed in the right-of-way acquisition negotiation process.

B-002-004

The FEIS states on page 3-93 "Where property acquisition and residential or business displacements are unavoidable, the project would provide compensation and relocation assistance." These compensation and relocation assistance measures would comply with the Uniform Relocation and Real Property Acquisitions Policy Act of 1970 (as amended) and any other applicable federal and state regulations.
Mr. Epstein's comment assumes that Diversified Marine will be displaced;however, it is not expected that Diversified Marine would be displaced by the CRC project improvements. Additionally, for displaced businesses, the FEIS does not specifically state the compensation provided to each displaced business, as this is something that is negotiated following an appraisal and during the property acquisition and business relocation process.

B-002-005

Please see response to B-002-004.

B-002-005 As noted above, the FEIS does not discuss uncompensated impacts and does not adequately assess the significance of the loss of DMI if its office building cannot be relocated or replaced and/or if DMI cannot obtain ample vehicle parking and storage and staging areas proximate to the shipyard.

B-002-006 6. Exhibit 3-4.6 at P. 3-110 identifies parking impacts of the project. It does not list loss of parking for DMI now situated on land leased from ODOT. This are a temporary and permanent effects that are not discussed in the FEIS.

B-002-007 7. Section 3 of the FEIS states:

> *Construction activity for the LPA would temporarily disrupt land uses on Hayden Island, but would not likely have as much of an effect elsewhere in the project area…* (p. 3-119)

This statement is incorrect. Construction activity associated with the LPA in general and with the LRT and Hayden Island collector bridge in particular will disrupt operations at DMI in at least three ways: (a) temporary (and perhaps) permanent loss of the DMI office building; (b) loss of parking for DMI and (c) loss of storage and staging areas on land leased from ODOT.

B-002-008 8. In the discussion of long-term effects, Sections 3 and 6 of the FEIS states:

> *Most negative economic impacts would result from business displacements, losses in parking, or changes in access to businesses. For those businesses displaced by the project, the acquiring agencies would provide a relocation assistance program. Property acquisitions affecting other uses would also be mitigated by relocation assistance, as described in Section 3.3, Property Acquisitions and Displacements.* (p. 3-120)

> *Property owners would receive just compensation for the estimated value of land and improvements acquired and for other impacts that result in a measurable loss of value to the remaining property. Just compensation would also be provided for displacement of personal property, including situations where there is a displacement of personal property that is not owned by the property owner or tenant (known as personal property only relocations).* (p. 6-17)

As noted above and below, the FEIS does not address uncompensated impacts and the potential loss of DMI due to the inability to restore the DMI office building and to replace leased parking, storage and staging areas lost due to the project.

B-002-009 9. *Actions Taken in Response to DEIS* (pp. 6-33, *et seq.*) does not address impacts to DMI.

B-002-010 10. DMI appreciates the responses in the FEIS to the comments by and on behalf of DMI. See item codes B-019, B-026, B-038 and B-059. Our concerns have been consistent since we became involved with the project in 2007.

B-002-006

The Economics Technical Report (pages 4-3 to 4-4) describes the parking impact to the ODOT property that is leased to DMI.

B-002-007

The section you reference describes temporary effects to land use and economics from the LPA. Temporary effects from construction are defined as effects that would end when construction ends. The three impacts that you list are permanent impacts. Impact (a) is addressed in Chapter 3--Section 3.3 Property Acquisitions and Displacements. Impacts (b) and (c) are addressed in the Economics Technical Report (as referred to in the response to B-002-006).

B-002-008

Please see response to comment B-002-004.

B-002-009

You are correct. Chapter 6 is about public input on the Draft EIS, and does not discuss all the impacts that are addressed in Chapter 3 or in the technical reports (such as the Acquisitions Technical Report).

B-002-010

As stated in Mr. Epstein's letter, DOTs and TriMet staff will continue to work with DMI and its representatives as the CRC project moves along in the design process.

With the information gained from ongoing discussions with DMI representatives, it has been determined that DMI is not expected to be displaced. As the project design advances and as discussions with DMI continue, the DOTs and TriMet staff will work with DMI to determine fair market value compensation for any losses incurred.

B-002-010

We also appreciate and acknowledge that staff from the CRC, ODOT and PDOT have met one-on-one with DMI, toured our facility and modified the recommended LRT and Hyden Island collector bridge alignment so that it does not split our parcel in two.

We also understand that some of the discussion and analysis in the DEIS and FEIS is necessarily of a nature that does not allow for the sort of finer-scale analysis at which the specific impacts to DMI's site and operations are timely and appropriate.

But we would be remiss if we did not point out those impacts now so that, as project planning becomes more detailed, our concerns will be addressed. We welcome continuing contact and coordination with the project staff and officials to this end.

Also we respectfully disagree with some of the responses to our comments, as noted elsewhere in this letter and below. We hope to persuade you to endorse and support our positions and to respond more fully to our needs as the project continues.

In several responses to our comments, the FEIS states, "it is not expected that Diversified Marine would be displaced by the CRC project." As noted above we appreciate that the project has shifted the LRT and island collector bridge alignment so that it does not split our ownership in two. That preserves in one piece the parcel owned by DMI.



But as noted in prior testimony and in our comments in response to the DEIS and shown on the left, the property owned by DMI for the shipyard is only about ¾ of an acre. Additional land critical to the business operations is leased from ODSL in the Portland Harbor. As importantly, DMI leases from ODOT an additional 2+ acres of upland area between the shipyard and Marine Drive. DMI uses this leased land for vehicle parking and for storage and staging of equipment and supplies. Without this land or a roughly equivalent area with convenient access to the shipyard, DMI cannot operate. Nowhere does the FEIS address this. We also believe that the Uniform Relocation and Real Property Acquisitions Policies Act of 1970 does not provide adequate if any compensation for such impacts.

We cannot emphasize enough that, to survive, DMI must have land proximate to the shipyard in which to park vehicles and to store and stage equipment and supplies. We appreciate that CRC, ODOT and PDOT staff are aware of this need from ongoing discussions. But this issue is not resolved yet. We hope that it can be resolved in the future. If it is not resolved, the CRC project will displace DMI.

B-002-010

As we have noted elsewhere in our testimony regarding the project, there is no place else where DMI can relocated. If it is displaced, DMI will be out of business. The result of this would be the loss of $10± million in income to the region and 50± family-wage earning jobs.

Thank you for considering our concerns.

Sincerely,

On Behalf of Diversified Marine, Inc.
Larry Epstein, JD, FAICP
9930 SW Quail Post Road
Portland, OR 97219-6367
503-317-3182
lepc@comcast.net

Hines, Maurice

From: Gill Wallis [gwallis@walliseng.net]
Sent: Monday, October 24, 2011 8:37 AM
To: Columbia River Crossing
Subject: Comment letter on Final EIS
Attachments: Historic Lucky Lager WarehouseBldg Comment Letter to CRC FEIS.pdf

Please find attached my comment letter on the CRC project Final EIS. I will also be delivering a hard copy to the Vancouver office.

You can reach me at 360-600-7094 if you have any questions.

Ms. Gillian Wallis
Mobile: 360.600.7094



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October 22, 2011

Columbia River Crossing
700 Washington Street, Suite 300
Vancouver, WA 98660

RE: Final Environmental Impact Statement Comment Letter
Columbia River Crossing Project

To Whom It May Concern:

B-003-001 I am writing to submit comments to the Final EIS for the referenced project and ask that the Record of Decision (ROD) include a statement that postpones acquisition of the property upon which the Historic Lucky Lager Warehouse Building is located until such time as the Locally Preferred Alternative (LPA) for the Columbia Street Park and Ride facility (referred to herein as the CPnR) is re-evaluated.

The lack of any evaluation and public input into this alternative points to a wider policy issue regarding local input into the impacts of the CRC project. Because the design is still in the conceptual stage, it is likely that small changes in final design could change impacts to properties as it is finalized. It appears reasonable to request that the Record of Decision for this project provide enough flexibility so that minor changes can be made to minimize impacts as the project moves through final design, and that properties are not acquired where there is the possibility of those changes.

I am making this request because I believe the CRC process by which the LPA for the Columbia Street Park and Ride facility was chosen violated NEPA. Those NEPA process deficiencies are shown graphically in Attachment A and summarized in Attachment B. They include:

- The LPA for the CPnR was selected without ample public input, particularly as related to the impacts to the Historic Lucky Lager Warehouse Building. In fact, at a public meeting whose sole purpose was to get input upon the CPnR alternatives, in response to a question about the Lucky Lager building, CRC staff falsely stated that the building site would be acquired regardless of CPnR options selected.
- The limited amount of public input obtained for the CPnR was ignored in the decision making process and blatantly suppressed from public record, including that in the FEIS.
- In evaluating alternatives for the CPnR, the EIS process failed to complete an economic and land use analysis of alternative sites.
- The decision making process for the CPnR failed to adequately address historic impacts. That process clearly violated Washington State's SEPA.

The LPA for the Columbia Street Park and Ride facility would likely not have been selected if the FEIS did not include a number of key factual errors which I have summarized in Attachment C. These are:

- The FEIS erroneously states that alternative locations for the CPnR were evaluated in the DEIS. Only one location was mentioned in the DEIS.

215 W. 4TH STREET, SUITE 200 VANCOUVER, WA 98660 ▪ 360.600.7094

B-003-001

The process that resulted in the Lucky Lager Warehouse being identified as an anticipated acquisition was part of ongoing work between CRC, the City of Vancouver, and C-TRAN. Decisions around the Columbia Park and Ride location and the roundabout at the southwest corner of the block were part of a collaborative process similar to decision-making and design development for the rest of the project. The project development process is dynamic and includes making assumptions, gathering additional information, and sometimes changing designs or assumptions based on new information or analysis. The project will continue to attempt to minimize or avoid impacts to properties, including the Lucky Lager Warehouse. For displacements that are unavoidable, the Washington State Department of Transportation would provide relocation assistance to businesses in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act. The CRC undertook a study called the Lower Vancouver Urban Design Study with the City of Vancouver, C-TRAN, and the public. The major components of this study included vehicle circulation, development opportunities and mixed-uses, pedestrian access and safety, and urban design. Expansion of the park and ride footprint resulted from an analysis of the number of spaces required at this location and the height of the structure as compared to footprint. Four options were explored that resulted in structures that varied anywhere from four to six levels. The City of Vancouver suggested the parking structure should be designed with a minimal, practicable height, which requires expansion of the footprint to maintain a required number of parking spaces. Additionally, the expansion of the footprint had benefits to the project's other transportation modes. Further analysis of the SR 14 terminus indicated that the roundabout was the appropriate design for this intersection (4th and Columbia), preferred by both the CRC and the City of Vancouver. The CRC staff analyzed multiple roundabout alternative designs in order to minimize the footprint. Through that analysis, it was determined that more right-of-way was required northeast of the

B-003-001

- The FEIS presents conflicting information regarding the development and selection of the "site" for the CPnR, and confuses the selection of the site with the selection of the design option (surface lot versus garage).
- The FEIS significantly understated the economic impacts associated with the proposed demolition of the Historic Lucky Lager Warehouse Building.
- The FEIS did not evaluate land use impacts associated with the proposed demolition of the Historic Lucky Lager Warehouse Building.
- The FEIS erroneously characterized the visual impacts of the LPA for the CPnR.

It is clear that the selection of the LPA for the Columbia Street Park and Ride facility violated NEPA. It is equally clear that the FEIS was prepared to justify the selection of an alternative that would likely not have been selected if the NEPA process had in fact been followed. Again, please place a comment into the ROD which requires the property acquisition for the Historic Lucky Lager Warehouse Building property be postponed until such time as NEPA is satisfied in regards to the selection of the LPA.

Sincerely yours,

Gillian Wallis

Gillian Wallis

Attachments:

Attachment A – NEPA Process Disclosures of Impacts to Historic Lucky Lager Warehouse Building
Attachment B – NEPA Process Errors
Attachment C – Factual Errors
Attachment D – Advisory Group Meeting Minutes
Attachment E – Historic Lucky Lager Warehouse Building Economic Value
Attachment F – Advisory Group Member's Supporting Letters
Attachment G – DEIS Chapter 22 – Description of Alternatives, page 2-34
Attachment H – FEIS Chapter 2 – Description of Alternatives, Park and Rides, pages 2-26 to 2-27
Attachment I – *Historic Lucky Lager Warehouse Building Historical Analysis*, Eric Eisemann, University of Oregon Adjunct Professor in the Master's Program in Historic Preservation

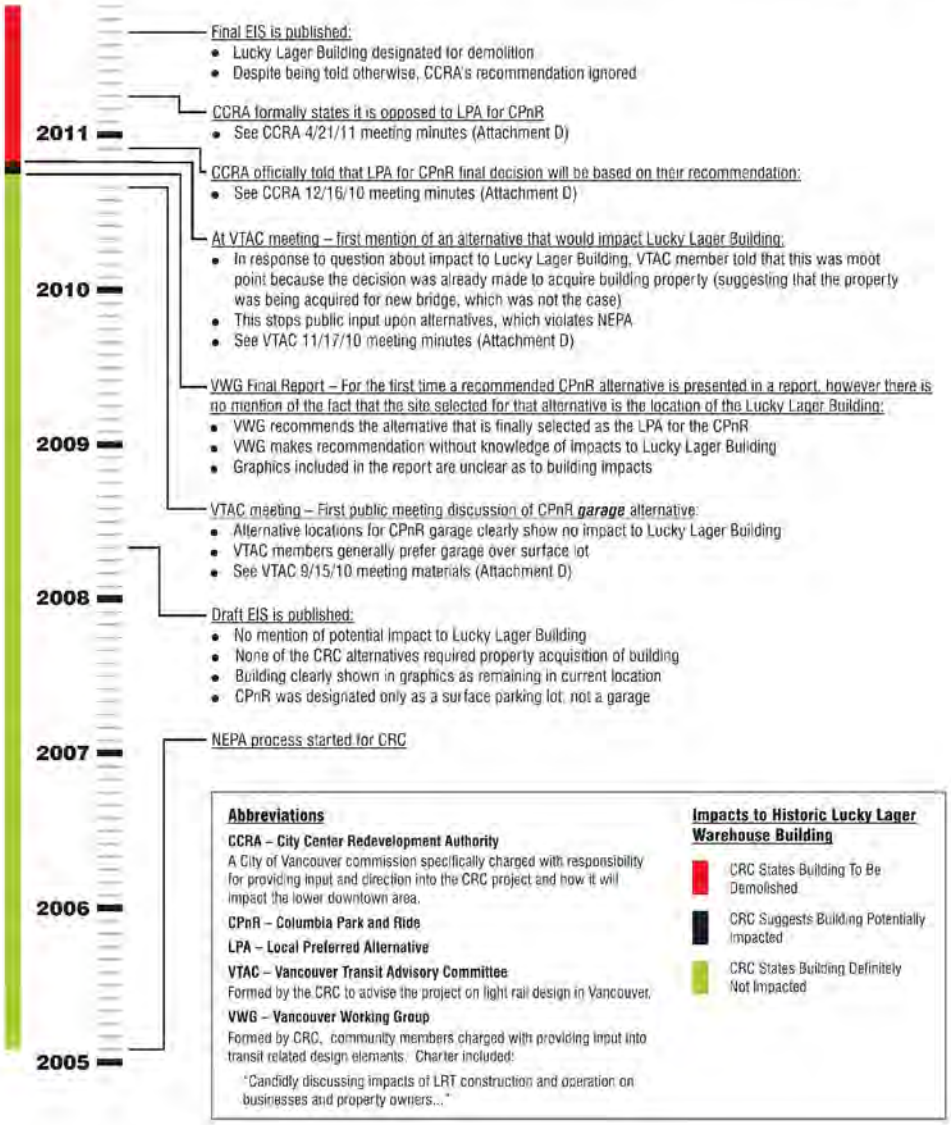
roundabout. The combination of the above-mentioned analysis resulted in the current design and impacts. The FEIS describes the general process for selecting the LPA in the summary on page S-9 and in Chapter 2 starting on page 2-81. The purpose of the FEIS is to disclose the impacts related to the LPA compared to No-Build and the DEIS alternatives and describe what has changed since the DEIS. The FEIS does not contain a detailed description of how each design refinement was done; that level of detail is not typical for an environmental document. Although the Lucky Lager building is listed on the Clark County Heritage Register, it has not been found eligible for the National Register of Historic Places (NRHP). Qualified staff on the CRC project, and from the Esther Short Subarea planning process years before, both determined the building modifications to be too extensive for the building to be NRHP eligible. Regardless of the specifics of eligibility and associated protections, the project has attempted to avoid displacement of any building. Buildings listed on the Clark County Heritage Register are given special consideration.

Attachment A

NEPA Process Disclosures of Impacts to Historic Lucky Lager Warehouse Building

B-003-001

NEPA Process Disclosures of Impacts to Historic Lucky Lager Warehouse Building



Final EIS is published:
- Lucky Lager Building designated for demolition
- Despite being told otherwise, CCRA's recommendation ignored

CCRA formally states it is opposed to LPA for CPnR
- See CCRA 4/21/11 meeting minutes (Attachment D)

CCRA officially told that LPA for CPnR final decision will be based on their recommendation:
- See CCRA 12/16/10 meeting minutes (Attachment D)

At VTAC meeting – first mention of an alternative that would impact Lucky Lager Building:
- In response to question about impact to Lucky Lager Building, VTAC member told that this was moot point because the decision was already made to acquire building property (suggesting that the property was being acquired for new bridge, which was not the case)
- This stops public input upon alternatives, which violates NEPA
- See VTAC 11/17/10 meeting minutes (Attachment D)

VWG Final Report – For the first time a recommended CPnR alternative is presented in a report, however there is no mention of the fact that the site selected for that alternative is the location of the Lucky Lager Building:
- VWG recommends the alternative that is finally selected as the LPA for the CPnR
- VWG makes recommendation without knowledge of impacts to Lucky Lager Building
- Graphics included in the report are unclear as to building impacts

VTAC meeting – First public meeting discussion of CPnR *garage* alternative:
- Alternative locations for CPnR garage clearly show no impact to Lucky Lager Building
- VTAC members generally prefer garage over surface lot
- See VTAC 9/15/10 meeting materials (Attachment D)

Draft EIS is published:
- No mention of potential impact to Lucky Lager Building
- None of the CRC alternatives required property acquisition of building
- Building clearly shown in graphics as remaining in current location
- CPnR was designated only as a surface parking lot, not a garage

NEPA process started for CRC

Abbreviations

CCRA – City Center Redevelopment Authority
A City of Vancouver commission specifically charged with responsibility for providing input and direction into the CRC project and how it will impact the lower downtown area.

CPnR – Columbia Park and Ride

LPA – Local Preferred Alternative

VTAC – Vancouver Transit Advisory Committee
Formed by the CRC to advise the project on light rail design in Vancouver.

VWG – Vancouver Working Group
Formed by CRC, community members charged with providing input into transit related design elements. Charter included:

"Candidly discussing impacts of LRT construction and operation on businesses and property owners..."

Impacts to Historic Lucky Lager Warehouse Building

- CRC States Building To Be Demolished
- CRC Suggests Building Potentially Impacted
- CRC States Building Definitely Not Impacted

Attachment B

NEPA Process Errors

B-003-001

ATTACHMENT B – NEPA PROCESS ERRORS

PROCESS ERROR	IMPLICATION OF ERROR
Columbia Park & Ride LPA Not Fully Evaluated After publication of the DEIS, general evaluations were made between a 1-block garage west of Washington and a surface lot east of Washington. Evaluation and discussions occurred with the public and with advisory groups specifically charged with overseeing park and ride issues. Public preference was for a garage west of Washington. After this preference was indicated, a new 2-block alternative for that garage was introduced to advisory groups in late 2010. Who introduced it or why is not clear in the record. This alternative was not evaluated compared to the 1-block alternative, and its impacts were not made public or discussed in advisory groups or with the public. Letters from members of these groups are attached supporting this (Attachment F).	The implication of this error was that the public was not asked and thus provided no input into the impacts of the Columbia Park and Ride LPA. These impacts were significant. Because the 1-block garage did not impact the Lucky Lager Building and the 2-block garage did, the LPA for the CPnR (which is the 2-block alternative) was selected in direct violation of NEPA.
Public Input for 2-Block Garage Was Suppressed at a Public Meeting In November 2010, a statement was made in an advisory group meeting in response to a member's question. The question was whether the 2-block garage would require the demolition of the Wallis building (i.e., the Lucky Lager Building). A CRC staff member stated that it would be an acquisition in the Final EIS (Attachment D). This falsely implied that the decision to acquire the building property was made as part of other CRC alternative evaluations, which was not true.	The implication of this statement by CRC staff was that members of this advisory group (VTAC) were lead to believe that the decision on the alternative was made and there would be no discussion regarding the size or footprint of the Columbia Park and Ride. This occurred at a meeting whose purpose was to solicit input into the parking garage alternative.

Note: CPnR – Columbia Park and Ride

B-003-001

PROCESS ERROR	IMPLICATION OF ERROR
Land Use Impact of Columbia Park and Ride Not Evaluated No evaluation was made of the impact to current land use plans due to the loss of the Lucky Lager Building.	The loss of the Lucky Lager Building is in direct conflict with the 2007 Vancouver City Center Vision & Subarea Plan and Vancouver Comprehensive Plan. These plans encourage the protection and preservation of historic resources and promote the restoration, rehabilitation and reuse of historically significant older buildings. It is important to note that the current owners of the Lucky Lager Building spent $970,000 restoring the building over the past 10 years, in keeping with the intent of these plans. The failure by CRC decision makers to consider City adopted policy in decision making for the CPnR undermined the ability of the public to provide meaningful input into the selection of CPnR alternatives.
Economic Impact of Columbia Park and Ride LPA is Incomplete The FEIS completely ignored the fact that the Lucky Lager Building's very unique and very appealing character was a significant economic asset for downtown Vancouver. The building has a proven track record of attracting highly creative and innovative businesses to downtown Vancouver (Attachment E). This is why it is one of the few that is completely occupied at a time when downtown vacancy rates approach 15%. Currently 15 businesses with 80 employees work in the building. Although these businesses would be offered relocation assistance, there is a very little stock of similar buildings in downtown Vancouver and many will likely move out of the area.	The failure to address this economic impact undermined the ability of the public to provide meaningful input into the selection of CPnR alternatives. This failure demonstrates the complete bias of the CRC process in regards to the selection of the LPA for the CPnR. In reading the FEIS, it is almost impossible to ascertain the significance of the selection of the LPA for the CPnR. In reading the FEIS, the loss of the Lucky Lager Building is considered insignificant, yet that loss accounts for over 50% of the businesses displaced in Washington for the entire CRC project including bridge, ramps, rail, and the other two park and ride facilities.
Impacted Building's Historic Properties Not Evaluated The Historic Built Environment Technical Report (pgs 3-8 to 3-9) states that although the building is listed on the local historic register, it was found to be not eligible by professional architectural historians as a historic resource in the FEIS. There is no supporting data on how the building was found to be not eligible or the methodology used. Washington SEPA requirements in regards to historic properties were not evaluated. The building is clearly eligible as a historic property under SEPA guidelines, since it is on the Clark County Heritage register (a local historic register established by County Code).	The impact of the loss of this historic building is another example of the failure of the EIS to adequately assess the impacts of the CPnR LPA. This failure undermined the ability of the public to provide meaningful input into the selection of CPnR alternatives. CRC staff, who never discussed the historic issues with the building owners, were not aware of two critical documents, one prepared by local architectural historian Lynn Hunt, and the other by Eric Eisemann, Adjunct Professor in the Master's Program in Historic Preservation at the University of Oregon. Mr. Eisemann in fact prepared the supporting document for the Clark County Heritage Register application which states: "The … building is a significant illustration of simple downtown commercial and industrial architecture from the early 20th century."

Note: CPnR – Columbia Park and Ride

Attachment C
Factual Errors

B-003-001



ATTACHMENT C – FACTUAL ERRORS

THE ERROR	THE FACT	THE IMPLICATION
FEIS Falsely Claims the Location of the LPA for the CPnR Location was Evaluated in the DEIS: Section 2 (pg 2-85) of the FEIS discusses evaluation of multiple park and ride locations associated with transit alignments. It states 3 park and ride locations were selected, and: "These three park and ride locations were evaluated in the DEIS."	One of the three park and ride locations – the Columbia Park and Ride location – was not evaluated in the DEIS. In Chapter 2 of the DEIS – *Description of Alternatives*, a PnR in the general area of the Columbia Park and Ride was shown on *Exhibit 2.3-16* (pg 2-34). This exhibit (Attachment G) shows a surface parking lot on the east side of Washington in the freeway cloverleaf. The DEIS mentions only one location for this PnR and it is not the location finally selected.	By falsely stating that the CPnR location was evaluated, the FEIS masks the failure of the EIS process to provide public input into the selection of the LPA for the CPnR facility. Because there was inadequate public input, the FEIS understates the environmental impact of the LPA for the CPnR.
The FEIS Fails to Distinguish Between "Locations" for the CPnR and "Design Options": Section 2 (pg 2-85) of the FEIS discusses evaluation of multiple park and ride locations associated with transit alignments. It fails to mention that there are location alternatives for the CPnR and for each of these there is the option of a surface lot or parking garage.	There are several location alternatives for the CPnR. In those locations, either parking garages or surface lots are possible. A valid alternative analysis would distinguish between location options and design options. The FEIS makes no such distinction.	By failure to clarify that there are several options as to the location of the CPnR, and for some of these, significantly different design options, the FEIS fails to provide a logical basis for the selection of the LPA or assessment of reasonable mitigation measures.
The FEIS Understates Property Tax Impacts in Vancouver: Chapter 3 – Land Use and Economic Activity in the FEIS includes on page 3-110, *Exhibit 3.4-6 Summary of Economic Impacts*. This table incorrectly states there will be $12,100 in property tax impacts in Vancouver due to the project. Not including partial acquisitions, there are 38 full property acquisitions in Washington for the project.	The Lucky Lager Building alone pays about $15,000 in property taxes annually. It is unlikely it is the only Vancouver property acquisition (out of 38 full property acquisitions) that pays property taxes. The property tax impacts appear to be grossly understated.	This understatement points to the failure of the FEIS to adequately provide a correct assessment of the impacts of the LPA. It also points again to the failure to provide the public the opportunity to provide meaningful input into decision making.

Note: CPnR – Columbia Park and Ride

B-003-001

THE ERROR	THE FACT	THE IMPLICATION
Description of Impacted Building is Incorrect and Incomplete: As stated on the pages listed below: "…The Columbia Park and Ride would require the displacement of 11 professional offices that provide a variety of services in the fields of law, engineering, construction, architecture, land use, and energy, ands well as a food cooperative. Most of these are very small professional offices located in one building." Section 3 (pg 3-89); Appendix O – Attachmt: Environmental NEPA Re-evaluation and appendices (pg 29); Acquisitions Technical Report (pg 4-7); Land Use Technical Report (pg 4-9). Appendix A in the Acquisitions Technical Report incorrectly reports the building had 12 businesses.	The building being displaced contains 15 separate businesses, including 80 employees. The businesses listed failed to mention software design, and financial planning. The use of the phrase "very small" is misleading. The two largest businesses in the building have about 30 employees each, which is above the average number of employees of downtown Vancouver businesses.	These factual errors understate the impacts to the building. The language used is misleading and compounds the understatement. This points again to the FEIS masking the fact that the selection of LPA for the CPnR violated NEPA. It is important to note that the entire CRC project (bridge and all other components) displaced a total of 17 businesses in Vancouver. If the FEIS was correct in the fact that 11 businesses were displaced by the LPA for the CPnR, this one small component of the CRC displaced 1/3 of those total businesses.
Visual Impact of Alternative is Incorrect: Section 3 (pg 3-266) states: "The Columbia Park and Ride structure would be consistent with the urban fabric of the surrounding area." Similar statements appear in Appendix L – Mitigation Matrix, pg L-14.	This statement is incorrect in that the project is taking away part of the urban fabric with which the LPA structure should be compared with. The impacted building, along with two buildings on opposite corners and buildings one block north, are one to two story buildings of about the same age and type. The CPnR LPA is not visually consistent with these buildings.	The implications of this incorrect statement mean that the full impacts of the LPA were not taken into consideration.

Note: CPnR – Columbia Park and Ride

Attachment D

Advisory Group Meeting Minutes

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Meeting Summary

MEETING: Vancouver Transit Advisory Committee (VTAC)
DATE: September 15, 2010, 4:00 to 6:00 PM
LOCATION: Clark County Elections Building, Vancouver, WA

B-003-001

Attendees:

Vancouver Transit Advisory Committee Members

• Rob Barrentine	American Institute of Architects, Vancouver
• Ken Becker	Lincoln Neighborhood Association
• Marci Carr	Property Owner
• Sara Carter	Vancouver Resident: C-TRAN Commuter
• Lee Coulthard	Vancouver Downtown Association
• Caroline Hutton	Property Owner
• Elizabeth Jordan	Vancouver-Clark Parks & Recreation
• Mark Masciarotte	CRC Urban Design Advisory Group
• Terry McCarthy	Esther Short Neighborhood Association
• Randy Salisbury	Vancouver Resident: Architect
• Bob Sellers	C-TRAN Citizens Advisory Committee
• Vicki Vanneman	Marshall Community Center
• Debby Watts	Vancouver Resident: 17th Street Property
• Bob Williamson	Clark College

Staff:

• Katy Belokonny	CRC
• Wes King	CRC
• Nolan Lienhart	ZGF
• Brian McCarter	ZGF
• James McGrath	ZGF
• Scott Patterson	C-TRAN
• Jeff Hamm	C-TRAN
• Matt Ransom	City of Vancouver
• Sandra Towne	City of Vancouver

Note:
- **Meeting materials** and handouts referred to in this summary can be accessed online at: http://www.columbiarivercrossing.org/ProjectPartners/VTACMeetingMaterials.aspx

B-003-001

Welcome/Meeting Goals **Matt Ransom**

Matt Ransom welcomed members to the VTAC meeting and introduced new staff members. Ransom said that the goals of the meeting are to provide direction to CRC staff regarding streetscape and station design concepts, as well as discuss the Lower Downtown Vancouver Design Refinement that will be featured at Monday's Open House.

Station & Streetscape Design **Brian McCarter/Nolan Lienhart**

Brian McCarter and Nolan Lienhart, transit urban designers with ZGF Architects, gave a slide presentation (available at the Web address above) illustrating various downtown Vancouver street design (i.e. streetscape) and station design options. The VTAC expressed a preference for "Streetscape Concept 1: The Hybrid" option, which is consistent with the City of Vancouver Main Street Study. The station design options explored various degrees of [1]hardening, ranging from an open station to a hardened station, and applied the treatments to site-specific locations. McCarter said that the station design concepts featured in the presentation are specific to the four light rail station platforms located between 9th and 16th streets. The touchdown and terminus stations will be designed individually.

Questions and Discussion

STREETSCAPE

Street Treatment:

Mark Masciarotte said that he prefers concrete paving to asphalt, but acknowledges that it is more expensive. McCarter said the concrete paving is currently not in the project budget, but volume purchasing discounts can be explored.

Landscaping:

Randy Salisbury asked if we can make the sidewalks wider instead of having a landscaping strip. McCarter said that we can customize designs to accommodate individual property owner preferences. Terry McCarthy suggested that landscaping not be included as part of the design, until a specific funding mechanism is identified, because the City of Vancouver does not maintain current landscaping. Ransom said that there are no funds set aside for planting maintenance so it is important to think critically about the design's longevity. Elizabeth Jordon said that it is important to differentiate between trees and shrubbery; specifically prioritizing maintaining the tree canopies and realizing that trees are much easier to maintain than shrubs.

Masciarotte said that there should be trees in the station areas to provide shade to transit riders.

Overhead Catenary System (OCS):

Salisbury asked about the various OCS options for the light rail system and recommended that whether a cantilever or span wire system is used, that it be a dual-use pole (i.e. combined with light fixtures and/or traffic signals).

Light Fixtures:

Rob Barrentine asked if the light fixtures need to match the current downtown standard or if something other than an ornamental can be considered to ensure efficient street lighting. Ransom said that in order to use something other than the current light fixture, there would have to be a code change to the City of Vancouver's light district standards. McCarter confirmed that the lamp within the fixture can be changed from what is currently used to create a brighter light.

[1] *STATION HARDENING IS A TERM USED TO DESCRIBE THE USE OF PHYSICAL TO DEFINE SPACE IN AND AROUND A TRANSIT STATION, AND TO CONTROL MOVEMENTS IN AND OUT OF THE STATION ITSELF. THERE ARE VARYING DEGREES OF STATION HARDENING, WITH VARYING LEVELS OF ACCESS CONTROL AND MANAGEMENT.*

B-003-001

McCarter said that the city standard of six light fixtures per block will ensure enough light is provided. Ransom said that existing light fixtures will be replaced, as part of the project, which will provide an opportunity to examine each fixture for luminosity and maintenance needs.

Caroline Hutton agreed that good lighting is essential at the light rail stations.

LIGHT RAIL STATION DESIGN
Jeff Hamm challenged the committee to work through the benefits and disadvantages to open vs. closed stations (i.e. hardening can help with fare enforcement, but infrastructure can clutter the sidewalk).

McCarter reminded members that station design priorities should be consistent with the Urban Design Advisory Group recommendations, the Vancouver City Center Vision, the City of Vancouver Main Street Study, and the Vancouver Working Group Key Considerations.

Station Design Comments
Marci Carr said that Vancouver is not Portland and that we should stop trying to mimic the station designs that have been used there. Carr elaborated by saying that we have different pedestrian and transit rider needs in Vancouver and that Vancouver's stations need to be designed in a way that reflects the friendliness, neighborly, hominess of the city.

McCarter suggested that consideration be given to moving the 9th Street Station light rail shelter to the north end of the block, in front of a parking lot, to allow more sidewalk space in front of the restaurant located at 901 Washington Street.

McCarthy said that technology will greatly advance by 2018 and will allow for new opportunities to monitor fare evasion.

Salisbury said that he likes the idea of roof overhangs being mounted on buildings at station blocks to serve as the shelter. McCarter said that they are actively pursuing this concept at the Mill District station because the parking structure will lend itself to combining the sidewalk and station area.

Masciarotte suggested approaching the station design less linearly by staggering the infrastructure to ensure that transit riders do not feel trapped in the station area. Masciarotte added that his experience with hardened stations across the country is that they tend to be very oppressive, and somewhat dangerous, environments.

Open Stations Preferred
Members' specific open station design preferences are as follows:

- Intermix as many different uses as possible (example: Davis Street Station in Portland, Oregon, as seen on pg. 16 of slide presentation); the sidewalk and the station should be considered shared-use space.
    - Wesley King reminded members that all non-station blocks will be completely open.
    - McCarthy said that stations need to be designed to reflect a 2020 transit-oriented community vision, instead of designing segregation between pedestrians and transit riders. McCarthy added that the lack of architecture in the station area will allow intermixing of pedestrians and transit riders and will help change social attitudes regarding transit.
- No glass screens used in front of businesses; openness is a priority.
- Use transit security and ordinances or policies, instead of structure, to provide fare enforcement and safety/security.

B-003-001

- Ransom said that the City of Vancouver is pursuing enacting an ordinance that allows C-TRAN the maximum fare enforcement authority.

- Locate the shelter pole in the center of the station area, instead of at the back of the station area, so that transit users and pedestrians can seamlessly intermingle.
- Site-specific light rail station design should be used to create stations appropriate for each adjacent property.
- Instead of using physical barriers to separate transit riders from pedestrians, use pavement demarcation (via color or pattern) and signage.
- Apply a modular concept, meaning that the stations should be initially built as open stations, but designed in such a way that infrastructure (i.e. wind screens or leaning rails) can easily be added to the stations as needed.
  - Sara Carter said that it is a mistake to initially build hardened stations when the station areas have not yet proven to be problematic.
  - Jordan said that members need to think about the 10 percent of the general public that are going to cause problems and attempt to design stations in a way that preemptively solves problems.
- The station infrastructure should be minimal, however certain transit rider amenities should be incorporated, including wind screens and leaning rails.
- An equally high priority should be placed on the pedestrian environment, as the transit environment.
  - Barrentine said that there is a poor quality of space for pedestrians on station blocks, when the station is hardened, because the sidewalk area is unwelcoming and simply a place to move through.

Ransom summarized the members' discussion by saying that the committee clearly articulated a preference for an open station design.

Jeff Hamm said it is an important exercise to explore all options, from completely open to closed, so that the pros and cons of each design option can be understood and explained.

Bob Williamson said that station blocks being pedestrian friendly and safe for transit riders are not incompatible goals. Williamson encouraged members to be willing to compromise and approach station design with creativity.

King said that although the VTAC has communicated a preference for open stations, C-TRAN does have certain design requirements that will also have to be accommodated. King said that a semi-hardened station may be the solution so that transit amenities and infrastructure can be provided to accommodate C-TRAN rider and safety needs, but placed in a strategic way to also create a pedestrian-friendly environment.

ADDITIONAL QUESTIONS/COMMENTS
Carter asked how busses get back into traffic after being at a full-block bus stop. McCarter said that signal preemption will be considered for peak traffic times.

Bob Sellers asked about the width of the sidewalks and if they are going to be wide enough for wheelchair accessibility. McCarter said sidewalks will be 19.5' wide at station blocks and 17' wide at non-station blocks, which provides sufficient space for wheelchairs.

Lower Downtown Vancouver Design Refinement **Wesley King**
Wesley King, Deputy Transit Team Manager with CRC, gave a slide presentation (available at the Web address above) showing new developments in the design of the light rail station area south of Seventh Street in downtown Vancouver. Members expressed a preference for the Park & Ride location between Washington and Columbia streets and 4th and 5th streets because of the

B-003-001 opportunity for a mixed-use function on the first floor of the structure, as well as joint-use parking opportunities. The VTAC also communicated support for 5th Street being a through street to help maximize vehicular circulation in the downtown core.

Closing **Matt Ransom**

Ransom invited committee members to attend the upcoming Vancouver Light Rail Design Refinement Open House, occurring Monday, September 20, 2010 from 6:00 – 8:00 p.m. at the Hilton.

The next VTAC meeting will occur on Wednesday, October 20, 2010 from 5:00 – 7:00 p.m. at the Vancouver Housing Authority (2500 Main Street, Vancouver, WA 98660).

NOTE: pages removed from this presentation for brevity

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Oregon Department of Transportation

Washington State Department of Transportation

B-003-001

Lower Downtown Vancouver LRT Design Refinements

Wesley King & Matt Ransom

September 15, 2010



Park & Ride Location: *Option 1*



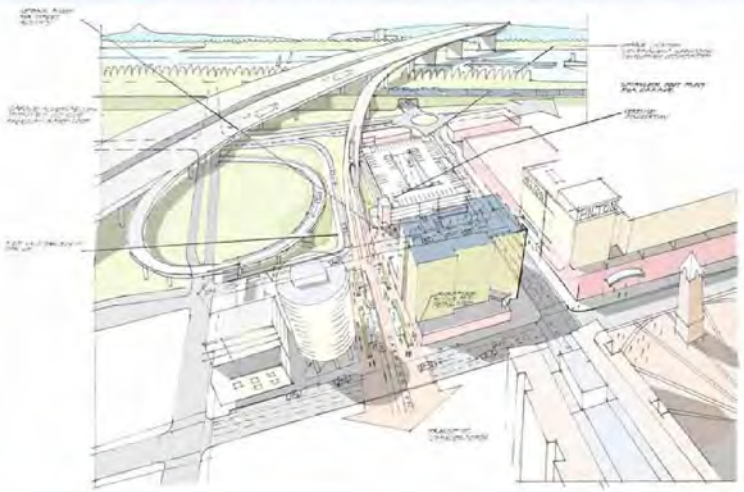
Columbia River CROSSING

Park & Ride Location: *Option 1*



Columbia River CROSSING

Park & Ride Location: *Option 2 (recommended)*



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Park & Ride Location: *Option 2 (recommended)*



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B-003-001

See Page 5 highlighted text

Columbia River CROSSING

Meeting Summary

MEETING: Vancouver Transit Advisory Committee (VTAC)

DATE: November 17, 2010, 4:00 to 6:00 PM

LOCATION: C-TRAN Administration Building: 2425 NE 65th Avenue, Vancouver, WA 98661

Attendees:

Vancouver Transit Advisory Committee Members

• Ken Becker	Lincoln Neighborhood Association
• Marci Carr	Property Owner
• Troy Drawz	Vancouver Housing Authority
• Caroline Hutton	Property Owner
• Dean Irvin	Property Owner
• Elizabeth Jordan	Vancouver-Clark Parks & Recreation
• Dick Malin	Central Park Neighborhood Association
• Mark Masciarotte	CRC Urban Design Advisory Group
• Terry McCarthy	Esther Short Neighborhood Association
• Dick Pokornowski	CRC Urban Design Advisory Group
• Randy Salisbury	Vancouver Resident: Architect
• Vicki Vanneman	Marshall Community Center
• Debby Watts	Vancouver Resident: 17th Street Property Owner
• Bob Williamson	Clark College

Staff:

• Katy Belokonny	CRC
• Wesley King	CRC
• Nolan Lienhart	ZGF
• Greg Baldwin	ZGF
• James McGrath	ZGF
• Scott Patterson	C-TRAN
• Jeff Hamm	C-TRAN
• Matt Ransom	City of Vancouver
• Sandra Towne	City of Vancouver
• Thayer Rorabaugh	City of Vancouver
• Phil Wuest	City of Vancouver

Note:

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B-003-001

Welcome/Meeting Goals **Matt Ransom**

Matt Ransom welcomed members to the VTAC meeting and introduced Greg Baldwin. Ransom said that the goals of the meeting are to provide direction to CRC staff regarding Park & Ride design concepts, as well as hear an update on the Overhead Catenary System and the light rail station design.

Park & Ride Design **Greg Baldwin/James McGrath**

Greg Baldwin and James McGrath, transit urban designers with ZGF Architects, gave a slide presentation (available at the Web address above) illustrating various Park & Ride design options. The VTAC expressed a preference for a living wall, green themed design for the Central Park garage; a brick design for the Mill garage; and a modern design incorporating glass and stone for the Columbia garage.

Questions and Discussion

CENTRAL PARK

Maintenance:

Terry McCarthy asked who is responsible for paying for the maintenance of the facility. He elaborated by saying that he supports the proposed living wall facade, but is concerned by the maintenance responsibility.

Wesley King explained that transit riders cannot be charged for parking in a Federal Transit Administration-funded garage, but that shared-use options are being investigated.

Bob Williamson said that if charging for parking is the only way to fund the maintenance of the structure then Clark College would have great concerns.

McCarthy said that it is necessary for maintenance funds to be identified prior to determining façade treatments for the garages and that he would like a commitment from the funding partners regarding maintenance.

Baldwin said that when project staff computes the cost for the designed structures, they also identify the continued maintenance fee.

Jeff Hamm said that C-TRAN's ballot measure funds will include funding the maintenance of the Park & Ride structures.

Façade Treatment:

Bob Williamson said that Clark College is very supportive of the proposed green theme. Williamson also said that the college is currently constructing a Science, Technology, Engineering, and Mathematics (STEM) building using brick and that CRC staff may want to tie the campus design theme into the Central Park façade.

Baldwin cautioned about using a heavy façade material on the large size of the structure.

Vicki Vanneman and Elizabeth Jordan said that they support the green façade treatment as long as there is an adequate maintenance plan identified.

Vanneman said that Hudson's Bay High School has a large horticulture program that may be key in maintenance of the structure.

B-003-001

Jordan said that community volunteers and gardeners already greatly support area projects and that there needs to be a different master plan for the maintenance of the Central Park garage.

Masciarotte said that there is relatively low-maintenance greenery available and that greenery selection is essential.

Caroline Hutton suggested that rainwater be used to water the greenery at the Central Park structure.

Pedestrian Circulation:

Mark Masciarotte asked about pedestrian circulation in the Central Park & Ride.

Terry McCarthy said that it would be beneficial to add a pedestrian access on the west side of the structure for emergency purposes.

Randy Salisbury said that the code dictates how many pedestrian accesses are necessary.

Miscellaneous:

Dick Pokornowski asked about the exact location/placement of the Central Park & Ride in proximity to Interstate 5 and McLoughlin Blvd.

Dick Malin asked about the seismic stability of the Central Park & Ride.

Greg Baldwin said that the garage has been designed to code requirements and that the structure's materials of concrete and steel are both seismically sound.

Ken Becker asked about who is planned to staff the security office identified in the design of the Central Park & Ride.

Matt Ransom explained that C-TRAN currently has security staff and that an on-site presence will be helpful in monitoring the light rail system.

Debby Watts asked if mixed uses are planned for the first floor of the Central Park structure.

Ransom said that none are planned for this site, but are incorporated in the designs for the other two Park & Rides.

MILL

Maintenance:

Vanneman asked about the exterior wood option for the Mill structure and expressed concern about the maintenance of the wood. Vanneman encouraged exploration of the type of faux-wood product being used on the new downtown library.

Salisbury said that the faux-wood product being used on the library is actually ceramic, which is easier to maintain than wood.

Baldwin agreed that the selected façade material needs to be durable enough to be a permanent screen.

B-003-001

Façade Treatment:

Hutton said that her façade preference would be to use a combination of the brick and wood façade options because each option has historical significance in the area.

Jordan said that the brick is a warm façade treatment and has a historic tie to downtown Vancouver.

Malin asked about the seismic stability difference between using brick or wood.

Baldwin stated that they would be equally seismically fit because they would both be designed to the current code.

Masciarotte said that it is essential to match the design of the Historical Museum, which has a brick facade.

Mixed-Use:

Jordan asked about if a retail market study has been conducted to see if the area can support new retail as a mixed-use function of the Mill garage.

Ransom said that a retail study has not been conducted, but that including mixed-use in this structure is a code requirement. Ransom elaborated by saying that mixed-use does not necessarily mean retail and that the most appropriate use might be office, etc.

Baldwin added that actively encouraging retail to locate in Park & Ride structures is essential in finding retail tenants for the space.

King said that a Transit Oriented Development Committee will be convened shortly and will be asked to evaluate the active use opportunities in the parking garages.

Hutton asked if the mixed-use space is designed to accommodate a large tenant.

Baldwin said that the space is not big enough for a large grocery store, but could work for a specialty grocery store such as New Seasons.

Hutton asked if there was a joint-venture opportunity to add residential on top of the parking structure and, if so, how that would affect the solar panel effectiveness of the current design.

Baldwin said that is would affect the solar panel effectiveness, but that other structural changes would have to be accommodated as well.

McCarthy said that many residents are not excited about the Mill Park & Ride due to increased traffic volumes, and that he does not want to add more congestion downtown by adding additional uses to the structure.

Sandra Towne asked if there is an opportunity for the structure to be designed taller so that it did not use the entire footprint of the block.

Baldwin said that the block is large enough to accommodate the Towne's proposed design, but that a taller and narrower garage would cost more to build and that its circulation would be slightly less efficient. Baldwin added that it would be important to identify the use of the remainder of the parcel before implementing the aforementioned plan.

B-003-001

Miscellaneous:

Hutton asked about bike parking accommodations at the parking structures.

Baldwin said that the ground floor of the Mill garage includes bike spaces, and that all three of the parking structures plan for bike parking.

Dick Pokornowski asked how staff plans on controlling who parks in the structure (i.e. transit or non-transit rider).

King explained some options and said that technology will continue to progress and allow even more opportunities.

COLUMBIA

Location:

Becker asked about the location of the southern-most Park & Ride.

King said that the project has currently identified the Columbia site, instead of the SR-14 on-ramp site, as the southern-most Park & Ride location. King said that one of the reasons the Columbia site was chosen was because of the active-use opportunities of the Columbia site.

Becker asked about the footprint of the Columbia structure and if the Wallis Building is planned to be acquired by the project.

King said that it is currently identified in the Final Environmental Impact Statement as an acquisition.

Becker asked about the benefit lost to the structure if it were to be shortened or if the space in the center of the structure was eliminated.

Dean Irvin asked about the location where light rail meets ground in relation to the Columbia Park & Ride.

Landscaping:

Masciarotte asked about the area around the structure and if it will contain landscaping.

Baldwin said that the amount of landscaping included on the site depends on the transit needs to use the area.

Towne clarified that the center of the Columbia structure is open to the air.

There were questions about the appropriate landscape use of the space inside the Columbia structure.

Façade Treatment:

McCarthy said that the Columbia structure needs to be aesthetically designed to be compatible with the bridge structure.

McGrath said that the east edge of the structure is being designed to respond and interact to the large structures around it.

B-003-001

Pokornowski said that the east side of the Columbia Park & Ride provides an opportunity to visually brand and create identity for downtown Vancouver.

Members agreed that the glass and stone structure should contain an east side that, perhaps through a lighting technique, provides an iconic design.

Masciarotte said that he really likes the idea of a glass structure that could be lit on the east side and asked if there would be a Federal Aviation Administration concern with lighting the east side of the structure.

Miscellaneous:

McCarthy asked about how the streetcar to the waterfront would interface with the Columbia site.

Ransom said that the streetcar would travel on Main Street, not Columbia Street.

McCarthy said that he would like to be sure that the structure is designed to support shared-use capacity to accommodate people who will be accessing the waterfront.

Overhead Catenary System **Matt Ransom**

Ransom briefly reviewed the Overhead Catenary System (OCS) plan for the light rail alignment in Vancouver. Please refer to the Web address above to view the slide presentation.

Light Rail Station Character **Wesley King**

King discussed the station design from a shelter design perspective.

Masciarotte and Hutton said that they like the transparent shelters.

Irvin said that he would like the shelters designed individually so that each shelter can be different based upon its location. Irvin added that he would like the same customized detail given to each shelter that the Park & Rides received.

Troy Drawz cited the light rail shelter, located by the Widmer Brewery in Portland, OR, as an example of a shelter that was uniquely designed to represent the surrounding area. Drawz said that he is also surprised that the Fort Vancouver historic theme has not been tied into the design of the parking structures or the light rail shelters.

Consensus of the group is that individualization of the shelters is essential.

Light Rail Station Design **Jeff Hamm**

Jeff Hamm said that C-TRAN is hiring a design firm to analyze the functionality and aesthetics of the current light rail station design. Hamm emphasized that this effort is essential because of the community concern expressed to C-TRAN regarding the safety and security of the light rail stations.

Closing **Matt Ransom**

Ransom summarized the action items and progress of the meeting as follows:

- CRC staff will progress the Park & Ride designs as directed,
- The OCS system, as presented, will be incorporated into project engineering plans,
- The light rail station design will be undergoing a safety/security analysis, and

B-003-001

- The light rail shelters will need to be brought to the VTAC for individual design customization.

Ransom said that it is undecided whether there will be a December VTAC meeting. However, if it does occur, the meeting will be held on Wednesday, December 15, 2010 from 4:00 – 6:00 p.m. at the Clark County Elections Building (1408 Franklin Street, Vancouver, WA 98660).

See Page 2 highlighted text

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City of Vancouver Washington, USA *Pride, Progress, and Possibilities*

City Center Redevelopment Authority (CCRA)
Meeting Minutes - Thursday, December 16, 2010
City Hall Council Chambers

B-003-001

MINUTES OF THE
CITY CENTER REDEVELOPMENT AUTHORITY
THURSDAY, DECEMBER 16, 2010
COUNCIL CHAMBERS, CITY HALL

MEMBERS PRESENT: Ward Cook, Debi Ewing, Marc Fazio, Richard Keller, Dick Pokornowski, Chris Wamsley
MEMBERS ABSENT: Jack Onder
STAFF PRESENT: Eric Holmes, Brent Boger, Matt Ransom

APPROVAL OF MINUTES
MOTION MADE BY RICHARD KELLER, SECONDED BY DICK POKORNOWSKI AND PASSED UNANIMOUSLY TO APPROVE THE MINUTES FOR SEPTEMBER 16, 2010.

GENERAL PROJECT UPDATES

Waterfront
Eric Holmes informed board members that BNSF recently held its first preconstruction conference with Nutter Underground. Excavation and preparation for shoofly construction will be underway soon.

Library
The Library project remains on schedule and on budget, with a grand opening anticipated in July, 2011. Holmes reminded board members that the parking garage originally intended as part of the project would be partially funded through the State's Local Infrastructure Financing Tool (LIFT) pilot program. Construction of the garage could begin as late as 2014 in order to receive the maximum benefit of the state contribution.

City Hall – 415 Building
Regarding the new City Hall project, Holmes informed board members that a small contract for tenant improvements has already been let. A larger contract that will cover construction of Council Chambers and the permit center will follow in early 2011. According to the current construction schedule, staff will begin moving mid-late first quarter, with the final phase of moves to be completed by the first part of August.

TRANSPORTATION UPDATE
Matt Ransom provided board members with a memo outlining status of the City's involvement in the I-5 CRC project and an overview of various initiatives connected to the overall project.

Community Connector
Regarding the proposed lid over I5, Ransom stated that potential scenarios are currently being evaluated. Planning of bike and pedestrian elements is ongoing.

Bridge Design and Aesthetics
An independent review panel recently convened for a second round of discussions related to proposed design and aesthetics. A new set of design concepts may be brought forward soon. It is anticipated that the final report will be issued in January.

Downtown Park and Ride Facilities
Ransom reminded board members that two Park and Ride facilities are proposed in the downtown area. At the September meeting, CCRA board members authorized staff to draft a letter on its behalf

B-003-001

to City Council recommending one site in the Mill District, and one site at 4th & Columbia.

Ransom provided a presentation originally prepared for the Vancouver Transit Advisory Committee (VTAC), which outlined the Downtown Park and Ride Facilities architectural design study that is currently underway (*see PowerPoint presentation titled I5 CRC Park and Rides Architectural Concepts dated December 16, 2010*).

Ransom presented members with examples of several garages and architectural elements, noting the consultant has given careful consideration to designs, materials and patterns currently present in the downtown core. The board was reminded that all sample renderings were draft in nature.

Both sites will have commercial space that may be leased for office or retail use. Active pedestrian fronts will be key elements of each design.

Mill District Site
C-Tran will likely have offices or a pass sales location on the ground floor of this 6-story facility. Two floors of retail are proposed. The consultant is working to build good connections east and west for pedestrian circulation at this site.

Matt presented renderings of wood and brick exterior options for this site and noted that the VTAC supports the brick alternative.

Columbia Site
Ransom reminded board members that it had discussed this proposed facility at two previous meetings. Leasable space at this location would primarily front Columbia Street. As this is an irregularly shaped site, the interior of the space would be open. A landscaped area on the second floor would create a more efficient use of space within the garage and facilitate ease of access for pedestrians to the ground level. Five floors are proposed for this site.

Regarding exterior options, Ransom stated that the architect has proposed utilizing the same stone as that found on the Convention Center for the ground floor. The upper stories would be shrouded by a modern, glass fin system that will ensure light into the garage during the day and allow transfer of light from the garage onto the street during the evening.

Marc Fazio asked if it would be feasible to build an interior greenspace that would only be visible to garage users and expressed concern over the fact that this interior, isolated and accessible space may be attractive to the homeless population.

Chris Wamsley suggested the design team consider something other than a greenspace in that area, siting ongoing maintenance concerns.

Ransom assured the board that the interior open space was created to accommodate asymmetry of the block and stated that no parking spaces would be lost as a result of the proposed design element. Staff trusts the architect is working to optimize the efficiency of the material costs and construction of the interior space. He will present the board's concerns to the design team for their consideration.

Chris Wamsley expressed concern regarding the amount money being spent on the designs and requested confirmation that the architect has been provided with a formal budget to work within.

Matt confirmed that the architect does have a design budget for the Park and Ride facilities and is prepared to work within that.

In terms of next steps, Ransom stated that the architect and design team are soliciting feedback from the VTAC and CCRA regarding the proposed design elements for each facility.

Deb Ewing asked what formal next steps would need to take place before the designs are finalized.

Ransom stated that staff will brief City Council on the proposed locations early in 2011. Discussions regarding the garages, shared use or parking and management options will follow. Council will not need to take action on the preferred location. The final decision will be based on the CCRA recommendation, as presented by staff.

B-003-001

Ward Cook raised the question of future maintenance for a modern, glass structure and expressed concern regarding construction of a facility that could potentially outshine the neighboring Hilton.

Dick Pokornowski asked staff to communicate the need for an aesthetically pleasing exterior that would compliment the Convention Center and requested additional information regarding the upper deck. Hilton guestrooms on the east side should not have views of a parking lot.

Ransom stated that parking on the upper deck will likely be visible from the hotel, but suggested that the design team could work with various elements to ensure it is visually pleasing (trees, trellis systems, etc).

Eric Homes stated that the proposed locations and design elements would be brought before Council for consideration in early 2011. In the meantime, Holmes assured board members that staff would compile information regarding progress of active CRC subcommittees, decisions and timelines in order to ensure the CCRA remains well informed throughout the process.

Chris Wamsley asked if there was a date on the timeline that would trigger loss of funding for the entire CRC project.

Holmes stated that the largest window of opportunity influencing that decision is the six-year reauthorization of the federal highway bill which scheduled the existing law. The original bill expired in 2009. It has been extended and should be taken up in the first half of 2011.

Under The Bridge – Waterfront Park Space
Matt stated that he would not have time to brief members on this project, but would be happy to attend the January meeting in order to provide an update.

Eric Holmes suggested the board dedicate its next meeting agenda to further discussion regarding Park and Ride design and the park space being planned under the bridge.

Ransom agreed to return in January with consultants for each project.

ELECTION OF OFFICERS
Ward Cook opened nominations for the offices of Board President and Secretary / Treasurer to serve throughout 2011.

Debi Ewing recommended that board members currently holding each position be reappointed.

MOTION MADE BY DICK POKORNOWSKI, SECONDED BY DEBI EWING AND PASSED UNANIMOUSLY TO NOMINATE WARD COOK AS PRESIDENT AND RICHARD KELLER AS SECRETARY FOR 2011.

BOARD STAFFING
Eric Holmes informed board members that Interim Assistant City Manager, Paul Lewis, would serve as staff for the City Center Redevelopment Authority (CCRA) until the recruitment process for a new Assistant City Manager is complete. The CCRA will become part of the Assistant City Manager's portfolio. The position was advertised in early December, and Staff anticipates a final selection by mid-March.

NEXT MEETING
There being no other business, the meeting was adjourned at 1:03pm.

The next meeting is January 20, 2011.

Approved:

_____
Ward Cook, President

B-003-001

See Page 5 highlighted text

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City of Vancouver Washington, USA *Pride, Progress, and Possibilities*

City of Vancouver » City Government » Boards and Commissions » City Center Redevelopment Authority (CCRA)

City Center Redevelopment Authority (CCRA)
Meeting Minutes - Thursday, April 21, 2011
City Hall Council Chambers

MINUTES OF THE
CITY CENTER REDEVELOPMENT AUTHORITY
THURSDAY, APRIL 21, 2011
COUNCIL CHAMBERS, CITY HALL

MEMBERS PRESENT: Ward Cook, Richard Keller, Jack Onder, Dick Pokornowski
MEMBERS ABSENT: Marc Fazio, Chris Wamsley, Debi Ewing
STAFF PRESENT: Brent Boger, Paul Lewis

APPROVAL OF MINUTES
MOTION MADE BY DICK POKORNOWSKI, SECONDED BY RICHARD KELLER AND PASSED UNANIMOUSLY TO APPROVE THE MINUTES FOR FEBRUARY 17, 2011.

GENERAL PROJECT UPDATES
Paul Lewis informed board members that tenant improvements at the new City Hall have been underway for the past month. Phased move in dates are targeted for June through August. Lewis reminded the board that this project will consolidate administrative staff from five separate locations throughout the city into one building. The Esther Short Building at 610 Esther Street will be vacated as a result of this move. It has been on the market for approximately one month with a formal asking price of $5.4M.

Farwest Steel is moving forward with construction of their project at the Port of Vancouver, and will be the first in our area to apply for New Market Tax Credits. The application process for this element of funding has been a collaborative effort between Farwest Steel, the City of Vancouver, Port of Vancouver and National Development Council. An announcement is expected within the next 30 days.

The Chamber hosted a soft opening of Fort Vancouver's new Main Library on March 22nd. It was a well-attended event. Grand Opening is schedule for July 17, 2011.

PeaceHealth continues to evaluate potential locations in Vancouver. Their site selection process is expected to conclude in June.

Regarding the Waterfront Access Project, Paul informed board members that construction of the Grant Street Bridge is approximately 50% complete. Site work continues in preparation of shoofly and T-Wall construction.

Paul informed board members that the Tax Increment Financing Bill and Public Facilities District tax credit extension bill appear to be dead for this legislative session. Mark Brown has indicated they are hopeful that additional funds may be available for a second round of Local Revitalization Financing, but was not incredibly optimistic it would come to fruition.

PRESTIGE PLAZA DEVELOPMENT AGREEMENT UPDATE
Paul provided board members with an overview of proposed revisions to the Prestige Plaza Development Agreement (*presentation titled Prestige Plaza Update, April 21, 2011*).

Proposed Development Program
The developer has proposed a full block, primarily residential, mixed-use complex to include:

- Residential Apartments: 92 units total
- 11,300 sf of commercial space

B-003-001

- 12 studios
- 46 one bedroom / one bath
- 34 two bedroom / two bath
- 5,600 sf on Mill Plan and 13th St
- Live/Work or Retail

Elie Kassab reminded board members that his team began preparing for a full block development at this location in 2006, but the final 15,000 square feet were not acquired until December, 2010. The proposed development consists of two L-shaped buildings, with corners on C St/Mill Plain and D St/13th St. Elie assured board members that this would be a very nice project, designed to attract additional housing developments to the downtown area. Elie noted that each building will offer a conference room, small gym and gathering space on the 4th floor, with outdoor balconies on the SE and NW corners of the complex.

Paul Lewis presented conceptual renderings of the development and specifically addressed the parking option proposed. Under Elie's current plan, parking would be located between each of the buildings, with a portion of it to be covered by structural overhang. The Code for this type of development calls for structured parking. It is unclear as to whether or not the current design would satisfy code requirements. Although the proposed concept provides surface parking only, the plan does remove cars from the street and bring them to the interior of the project.

Regarding schedule, Elie stated that Burgerville is tentatively scheduled to vacate in September and he would like to begin the anticipated 12-14 months of construction in October. Prestige will begin pre-leasing mid-construction and predicts it will take 6 months to fill both buildings.

Jack Onder asked Elie to speak to the retail versus live/work units proposed along Mill Plain, reminding the board that one of the Vancouver City Center Vision's (VCCV) main goals is to activate downtown streets.

Elie stated that he is open to placing retail on Mill Plain, but this decision will be dependent on the market. He noted that 13th Street would likely be more appropriate for Live/Work units that could accommodate a single operator (ie attorney, graphic designer or architect). Smaller retail spaces on the corners of Mill Plain/D St and 13th/C St could be ideal for a deli or convenience store. Elie noted that medical and dental tenants have also been considered.

Wark Cook asked where commercial / retail patrons would park, considering there are no spaces along Mill Plain.

Elie confirmed customers would utilize designated parking within interior of the development.

Jack Onder asked how many parking spaces were included as part of the proposed plan.

Paul Lewis confirmed that the 68 spaces anticipated would meet required codes for the residential and retail portion of the development. The pre-application conference scheduled for May 5 will confirm this project meets parking requirements.

Jack Onder cautioned Elie that renters often require a designated parking space. With 92 units and 68 parking spaces, this could prove problematic.

Elie reminded board members that there is a great deal of underutilized parking along 13th that could be designated for residents and potentially generate parking revenue for the city.

Summary of Proposed Changes

- Full Block Development - The original agreement was only for the property which Elie controlled at the time. The current proposal assumes a full block development (40,000 sq ft) and includes the current Burgerville location acquired in late 2010.
- Adjusts development program to match current development proposal.
- Addresses vesting of transportation capacity and system development charge credits for added property. Additional transportation capacity will be reserved based on the trips with the existing use.
- Potential for earlier start date - The original agreement anticipated a deadline of 2016 as its start date. The current schedule assumes construction will begin in October, 2011.

B-003-001

- Potential for Live/Work units on ground floor
- No bank or drive-thru feature
- No below-grade parking

	Original	Original with Added Property	Proposed
Minimum Building Height	5 Stories	5 Stories	4 Stories
Minimum Floor Area Ratio	3.0	3.0	2.5
Minimum Building Size	74,000	118,000	99,000
Minimum Gross Floor Area	60,000	96,000	90,000
Minimum Residential	40,000	64,000	80,000
Minimum Retail	10,000	16,000	10,000
Maximum Office	10,000	16,000	15,000
Other			
Retail on 1st Floor	✓	✓	✓ "Commercial"
Office Allowed on 1st Floor	No	No	Yes (live / work)

Next Steps

In terms of next steps, Paul noted that a pre-application conference was scheduled for May 5 and asked the board to consider a motion approving revisions to the original development agreement and forward its recommendation to City Council for their consideration.

Regarding financing, Lewis informed board members that the developer is still working to secure a funding package. Mr. Kassab will likely submit a request for Multi-Family Tax Exemption as an element of financing for this project. If an application for abatement is brought forward, it will be the first one received by the City in a number of years and necessitate revision of the original ordinance to comply with changes made to the State statute in 2007. In addition to the required updates, staff may propose creation of another residential target area along the Fourth Plain corridor.

Jack Onder asked if all units would qualify for the tax emption.

Paul Lewis stated that the tax exemption applies to all of the multi-family new construction but not the commercial development or the land. A twelve year exemption is available if 20% of the multi-family units qualify as low or moderate income housing. Applying the state's definition of rental rates that qualify as low and moderate income housing results in rental rates that are very close to current market rates.

Dick Pokornowski asked if the developer would be able to move forward in the event that Council was not willing to approve the request for tax exemption.

Elie stated that the abatement would be a critical element of project funding. At this time, the intention is to submit permit applications in June. If the exemption is not granted, construction will be put on hold until financing options improve.

Paul stated that the Tax Exemption revisions should be approved by Council before the permit application deadline for an October construction date.

Ward Cook asked what materials would be used on the exterior of the building.
Elie stated that they would be utilizing a combination on brick on the ground floor and cement board or stucco on the upper levels.

Jack Onder asked for reassurance that the retail component would effectively activate the street, as mandated by the VCCV.

Paul stated that code does require commercial use on the ground floor and assured the board that further discussion regarding the live/work concepts ability to do that would take place. Lewis acknowledged that while the experience with this concept on upper Main has been positive, it does not generate a considerable amount of traffic.

Jack Onder asked staff to clarify context of the motion before moving forward with approval.

B-003-001

Paul Lewis stated that staff was seeking the board's concurrence on proposed amendments to the development agreement only. The body's recommendation to Council would serve as an endorsement for their consideration and formal action.

Jack stated that while he encouraged the developer to move forward, he was not comfortable recommending the project as a whole.

Paul reminded board members that the development agreement itself does not dictate design or specific elements of the project, but rather provides a broad framework within which the development can proceed.

Richard Keller asked if a final design would be brought to the board for approval at a later date.

Paul Lewis stated that design recommendations from the CCRA board are not required for private development projects to move forward.

Richard Keller stated that most of the developments the board has recommended have provided a design element for their consideration.

Paul stated that the project would be coming back to the board on May 19 for further discussion of the Multi-Family Tax Exemption. Members will be provided with additional information regarding financing and return on investment opportunities at that meeting. An additional work session to address specific elements of the project and design options will also be scheduled.

Lewis reminded board members that the proposed development does not fit within the current agreement and will not move forward without approval of the proposed revisions.

Jack stated that he would approve the proposed changes, but was not prepared to make a positive recommendation regarding design or inferred development.

MOTION MADE BY DICK POKORNOWSKI, SECONDED BY RICHARD KELLER AND PASSED UNANIMOUSLY TO APPROVE PROPOSED REVISIONS TO THE PRESTIGE PLAZA DEVELOPMENT AGREEMENT APPROVED IN 2008.

COLUMBIA RIVER CROSSING DISCUSSION

Paul Lewis directed board members to their packets and called attention to a Summary Statement regarding the Park and Ride facility being proposed at Columbia & 5th Street. Lewis reminded board members that Ward Cook, Dick Pokornowski and Marc Fazio have been serving on a Columbia River Crossing (CRC) subcommittee of the CCRA for the past month.

Transportation Director, Thayer Rorabaugh and Long Range Planning Manager, Matt Ransom have attended each of the meetings. CRC project staff member Wes King has also participated in the ongoing discussion.

Lewis reminded board members that this group has been charged with reviewing design elements and development concerns specific to the proposed structure. A revision of the CCRA's October 2010 letter to Mayor Leavitt regarding this same topic will also be provided by the committee.

Dick Pokornowski stated that the Summary clearly outlines the committee's conclusions regarding the type of facility that should be constructed at this location if mandated by the Federal government as a required element of the CRC project. Subcommittee members agree that the proposed design does not compliment its neighboring surroundings, provide opportunities for future revenue or appropriately reflect the overall vision for downtown.

Ward Cook noted that the committee is proposing a parking structure be placed underground to encourage activity at street level.

Richard Keller suggested that the statement regarding incompatibility with surrounding architecture be strengthened, noting both aesthetic and functional deficiencies.

Dick Pokornowski stated that the committee's proposal of an underground structure would be offered as a form of compromise and formal acknowledgement that a parking facility at this location is not desired by the community. He noted that an underground structure would provide multiple

B-003-001 advantages and opportunities that will be missed if the proposed facility were constructed. The footprint of a below grade facility could be expanded beneath Lightrail to increase capacity without creating a dead street.

Paul offered that the committee has consulted with several members of the development community. It was suggested that residential may be a good use for the upper floors of this site, with smaller professional offices to occupy the ground floor, versus retail.

Ward reminded board members that the purpose of the Summary was to provide the City Council and project staff with a formal statement on behalf of the board that would clearly outline its opposition to construction of the structure as proposed at 5th / Columbia.

Richard Keller asked if there were any way to insist that the project return to the community in some capacity for approval of the design.

Paul stated that while the City has very limited jurisdiction with regard to the overall project, it does have a vote on the Project Sponsors Council. This Summary Statement provides a formal opportunity to raise the profile of this issue.

Ward Cook asked staff to strengthen the reference to underground parking as the preferred option and incorporate a statement that recognizes this site as a formal gateway to the City of Vancouver and state of Washington.

Paul agreed to incorporate the suggested changes and provide a revised Summary Statement to the subcommittee for review.

MOTION MADE BY DICK POKORNOWSKI, SECONDED BY JACK ONDER AND PASSED UNANIMOUSLY TO APPROVE THE 5Th /COLUMBIA PARK & RIDE SUMMARY STATEMENT WITH SUGGESTED CHANGES AND FORWARD TO CITY COUNCIL, CRC PROJECT STAFF, C-TRAN.

NEXT MEETING

There being no other business, the meeting was adjourned at 1:25pm

The next meeting is May 19, 2011

Approved:

_____
Ward Cook, President

Attachment E

Historic Lucky Lager Warehouse Building Economic Value

HISTORIC LUCKY LAGER WAREHOUSE



The Historic Lucky Lager Warehouse Building

An Economic Benefit to Downtown

B-003-001

1. The Building is a Magnet for Downtown Jobs

The Historic Lucky Lager Warehouse building has a history of attracting highly creative and innovative businesses downtown - the very type of businesses that hold promise for the City's future economic growth. The building is similar to many in Portland's very successful Pearl District, where historic buildings have been modernized for the needs of today's tenants.

In the past five years, the unique character of this building has attracted the following tenants:

- Logic Product Development - Vancouver office of innovative Minneapolis company with offices nationwide, providing product design, development, and engineering to manufacturing services
- High Tech Manufacturing Services (HTMS) - Administrative office of firm providing precision machine part manufacturing to order and for new product prototypes, with customers including Hewlett Packard and SEH
- Columbia Energy Partners – Company specializing in renewable energy projects, particularly wind energy development in the Northwest
- Neenan Archistruction – Vancouver office of innovative Colorado design-build company with focus on medical facilities (have built most of the Vancouver Clinics in the area)
- Gravitate Design Studio – West coast office of national website design and marketing company
- Panther Systems, Inc. - national leader in process automation and information technology

2. The Fact That the Building is Fully Occupied Points to Its Appeal

The building is one of the few that is completely (100%) occupied at a time when downtown Vancouver vacancy rates are one of the highest in the Portland Metropolitan area, averaging about 15 percent.

Currently 80 people work in the Historic Lucky Lager Warehouse Building. 15 separate businesses call it home.

3. Here is What Vancouver's Mayor Levitt Said About the Building

In April 2010, the Intertwine held their spring event in our building. The 80 attendees included a number of government officials, including Mayor Leavitt. Here is what Mayor Leavitt told the audience:

> "This is a wonderful space; I'm very envious of this space. Being an engineer, the spot I work in isn't quite as beautiful as this so I might be coming looking for a job."

215 W. 4TH STREET, SUITE 200 VANCOUVER, WA 98660 ▪ 360.600.7094

Attachment F

Advisory Group Member Supporting Letters

B-003-001

203 West 34th Street
Vancouver WA 98660-1908
October 19, 2011

To: Whom It May Concern
RE: CRC-FEIS comments (Columbia River Crossing-Final Environmental Impact Statement)

I oppose the taking of the Wallis Engineering building for the south-most parking garage, as specified in the FEIS.

I served as a member of the CRC-VTAC (Vancouver Transit Advisory Committee) and alternate on the VWG (Vancouver Working Group). When the VTAC began, plans presented showed the south-most parking garage inside the SR-14 to I-5 cloverleaf, on land already off the tax rolls. Months later, the plans changed suddenly to show it on the now partly vacant "auto dealer" lot east of Columbia and south of 5th. Then, at a subsequent meeting, its footprint expanded to include the block housing Wallis Engineering. The records show one objecting comment to removing these lots from the tax rolls, but the Committee was never asked for input on this, nor were the changes fully explained. VTAC and VWG had no self-selected leadership; agendas were controlled by staff.

The Wallis Engineering building is a historic structure, and I believe it is recognized by the county and/or state as a historic building. It has served a vital function as a business incubator for many small entities, recently including Vancouver Food Cooperative. The FEIS proposal would replace this beautiful historic building paying property tax with an outsized unsightly government-owned garage.

I'd hate to have the CRC proposal or public vote opposed because of this provision; small in terms of the CRC project, but tragic in its ramifications for this now nice mini-neighborhood. Consider how ugly a block in that part of town between 5th and the River could easily be.

If the rationale is, as has been stated, to preserve hotel views when the hotel paid for no such provisions, this is improper bias in favor of one business and against others.

Sincerely,

Kenneth M. Becker

B-003-001

700 Washington Street Unit 927
Vancouver Washington 98660
October 20, 2011

TO: Whom It May Concern
RE: CRC-FEIS (Columbia River Crossing- Final Environmental Impact Statement)

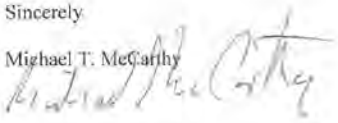
I served as a member of the CRC VTAC (Vancouver Transit Advisory Committee) and on the VWG (Vancouver Working Group). During the initial work of CRC VTAC a good deal of effort was expended to develop guiding principles. One of these was intended to protect existing businesses, if at all possible, in the development of light rail alignments and related facilities such as parking lots and rail stations. The light rail alignment options included details about all possible takings and played a significant role in the ultimate decision making. At this stage the related facilities were conceptual in nature and lacked supporting takings detail.

In fact, the VWG was formed to provide a review of more detailed options for the sizing and placement of the stations and park and rides. As a member representing the Esther Short Neighbor Association, I was particularly focused on mitigating the impact of the light rail investments to at least complement if not improve downtown pedestrian movements and encourage existing investments as well as look to the future. Because of the riverfront potential and the location of the fifth street rail station I favored the movement of the park & ride from under the new bridge and highway 14 connections to a location adjacent to the Hilton. This had the potential to further downtown investments and serve as an attractive gateway. In my opinion details related to sizing of the structure and its related takings were not provided to the VWG. CRC staff and their consultants were tasked with looking at the details of this conceptual solution.

Today, it appears that the Wallis building will be destroyed to make room for the parking garage a direct violation of one of our guiding principles. I am not comfortable that all options have been explored and would request that the process for placement and development of the parking garage continue with every effort expended to support an existing business with historical value. In order to ensure this effort, one that will require the expenditure of resources, I believe ROD should include this as a requirement for the CRC project's future efforts.

Sincerely

Michael T. McCarthy



B-003-001

500 Broadway St. Ste 603
Vancouver, WA 98660
21 Oct 2011

To Whom it May Concern:

I was a member of the VWG that made recommendations on light rail alignment and station and parking structure locations. I was also a member of VTAC saw various design concepts for stations and parking structures. The primary role of the VTAC was to provide input on the aesthetics for parking structures and transit stations.

The Columbia parking structure was originally going to be located inside the circular on ramp from SR 14 to I-5 SB. Then it was relocated to the block bounded by 4th - 5th - Washington - Columbia. Following a review by the Downtown Redevelopment Authority the conceptual design for parking structure was revised again. This third concept was briefly reviewed in our May 2011 meeting but there was little or no discussion of the impact on the property to the south. Most of our time was spent on the transit stations - what they looked like and how to harden them to maximize fare collections. We never got into details about property acquisition nor were we asked to make recommendations regarding them as this was not the work of this committee.

Well after our May meeting, I was surprised to learn that the third concept for the parking structure and a nearby roundabout required the taking of property in the block bounded by 3rd - 4th - Washington - Columbia. This area includes the recently renovated, historic Lucky Lager warehouse. Its heart breaking to think that this property will be a casualty of the CRC project. I feel great sympathy for Bob & Gill Wallis who find themselves in this situation and hope that something can be done to fairly mitigate their concerns.

Sincerely,

Lee Coulthard
360.750.8907 H
360.607.4224 C

Attachment G

DEIS Chapter 22 – Description of Alternatives, page 2-34

Exhibit 2.3-16
Minimum Operable Segment (MOS) Options



DIMENSIONS ARE APPROXIMATE.

The Clark College MOS would include the same three-level parking structure at Clark College as the Kiggins Bowl terminus. Local buses could carry passengers from a surface lot at Kiggins Bowl to the Mill Plain transit station. The terminus station could be between the park and ride and the highway, as indicated in the graphics, or it could be parallel to McLoughlin, either in the middle or to the side of the street.

Mill Plain Minimum Operable Segment

The Mill Plain District MOS would end the transit guideway at the new Mill Plain station between 15th and 16th Streets and between Washington and Main Streets, and could serve as a shortened version of either the Kiggins Bowl terminus or the Lincoln terminus. Future projects could extend the transit guideway to either full-length terminus.

This terminus option would include a Park and Ride structure one block north of the Mill Plain Station, as well as additional Park and Ride surface lots around the SR 14 interchange. Additional Park and Rides at Clark College, Lincoln, and Kiggins Bowl would be connected to the HCT guideway by local bus routes.

Transit Alignment Options

This section describes, from south to north, the transit alignment options that are available for each of the four terminus options. Three segments, or geographic sub-areas, of the project area are defined by discrete sets of transit alignment options in each:

- Segment from Delta Park to downtown Vancouver,
- Segment from downtown Vancouver to the Mill Plain District, and
- Segment from the Mill Plain District through North Vancouver.

Any alignment option in one segment can be matched to any alignment option in another segment. The same terminus and alignment options, as well as station locations, are being evaluated for light rail and bus rapid transit.

DELTA PARK TO DOWNTOWN VANCOUVER

The transit guideway would start at the existing Expo Center MAX station. The light rail component would extend the existing tracks. Bus rapid transit would entail building bus bays and other modifications for a bus transfer center and a new bus-only guideway north from the Expo

Attachment H

FEIS Chapter 2 – Description of Alternatives, Park and Rides, pages 2-26 to 2-27

EAST-WEST LIGHT RAIL ALIGNMENT AND TERMINUS STATION

Both north and southbound alignments of the couplet would become a two-way guideway traveling east-west on 17th Street. The double-track, center-running guideway on 17th Street would run until G Street, then curve north to McLoughlin Boulevard, and then continue east through the existing underpass beneath I-5. The underpass would be widened and the road bed lowered to accommodate the light rail trains and overhead catenary system. The guideway would end at a station and park and ride structure east of I-5, on the western boundary of Clark College and across from the Marshall Community Center, Luepke Senior Center, and Marshall Park.

Park and Rides

Three park and rides would be built in Vancouver along the light rail transit alignment (Exhibit 2.2-18).

Exhibit 2.2-18
Proposed Park and Rides Included in the LPA

	Columbia Park and Ride	Mill Park and Ride	Clark Park and Ride
Site Location	West side of Washington Street between 4th and 5th Streets	East side of Washington Street from 15th to 16th Streets	Northeast of McLoughlin Boulevard and I-5
Size (parking spaces)	570	420	1910
Number of Levels	5	4	5
Footprint (SF)	50,000	42,000	128,000
Retail Space Included Inside Structure	Yes	Yes	No

COLUMBIA PARK AND RIDE

A park and ride would be bounded by Washington, Columbia, and 5th Streets, and half the block between 3rd and 4th Streets. This facility would have five floors above ground and would contain approximately 570 parking spaces (Exhibit 2.2-19). Active uses would be included on the ground floor.

MILL PARK AND RIDE

A smaller park and ride would be built in the block surrounded by Washington and Main Streets and 15th and 16th Streets (Exhibit 2.2-20). This facility would have four floors, with active use space (which could include retail) on the ground floor. The current design includes 420 parking spaces.

CLARK PARK AND RIDE

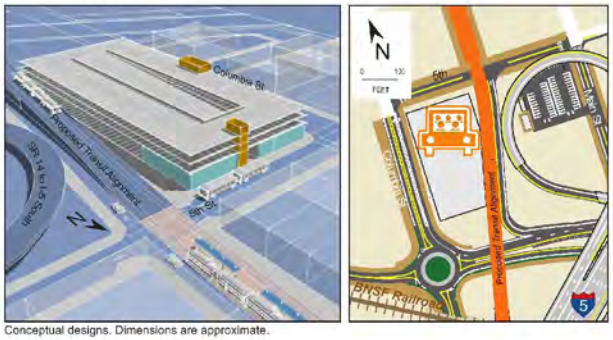
The largest park and ride would be built at the Clark College terminus. This facility would have five floors, and contain approximately 1,910 parking spaces (Exhibit 2.2-21).

Ruby Junction Maintenance Facility Expansion

The CRC project would expand the existing Ruby Junction Maintenance Facility in Gresham, Oregon to accommodate the additional LRVs associated

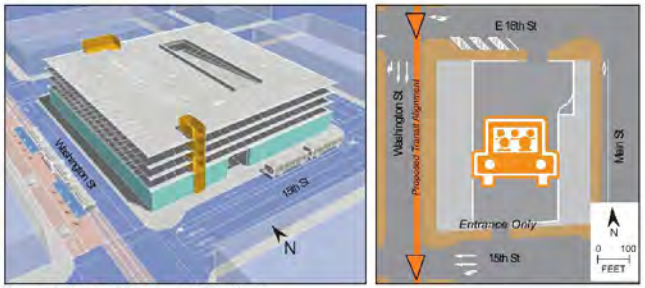
B-003-001

Exhibit 2.2-19
Columbia Park and Ride



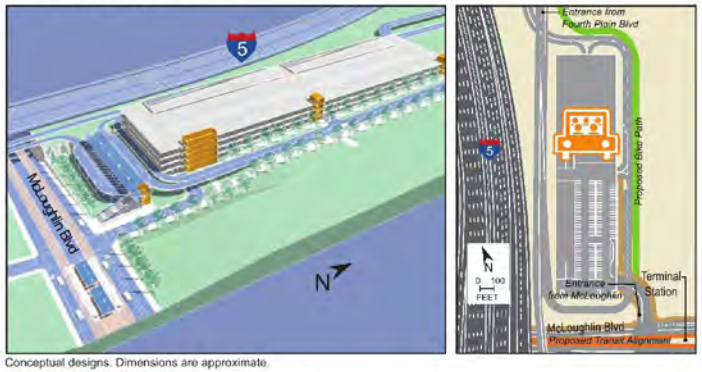
Conceptual designs. Dimensions are approximate.

Exhibit 2.2-20
Mill Park and Ride



Conceptual designs. Dimensions are approximate.

Exhibit 2.2-21
Clark Park and Ride



Conceptual designs. Dimensions are approximate.

Attachment I

Historic Lucky Lager Warehouse Building Historical Analysis,
Eric Eisemann, University of Oregon Adjunct Professor in the Master's Program in Historic Preservation

[Note that in this document, the building is referred to as the "Henkel" building, the original owner and builder)

B-003-001

Narrative Description

215 W 4th Street is an excellent example of early 20th century commerce and commercial architecture in downtown Vancouver. It is a two story concrete building, designed and built in a restrained commercial style that rests on a 0.28 acre parcel at the southeast corner of SW 4th St and SW Columbia Street. It is rectangular in shape, measuring approximately 100 feet x 110 feet and contains approximately 12,179 square feet within its walls. The pitched roof, built in two sections, runs south to north with a stepped parapet wall on the north façade, the building's primary facade.

The ground floor of the north façade contains five (5) large storefront windows, a central access way and one (1) garage door. The upper story is a segmented stepped parapet wall with six (6) window openings measuring 4 feet x 6 feet. The Columbia Street façade contains a bank of large storefront windows and two (2) pedestrian access ways, one in the center of the wall and the second at the south end. The second story contains four (4) window openings. A recessed rectangular sign panel running the length of the building separates the first and second stories on the north and west facades. The south façade abuts a parking lot and contains a ground floor access and two upper story windows. The east façade abuts an adjacent commercial building.

The earliest photographic evidence of the building found to date is from 1964. The photograph of the north façade shows that the second story windows are unchanged from 1964 to present day. In 1964 the wall openings on the north façade were in the present location but they are partially filled. A multi-pane transom light is visible above the filled storefront windows on the north and partial west facades. The style of the transom lights suggests an early 20th century design. In 1967 the window fill material was removed and the storefront windows were opened to their present configuration and style. The recessed sign panel is visible on the north and west facades in the 1964 and 1967 historic photographs and remains intact today. The photographic evidence and building permit research suggests that today the two primary elevations, the north and west facades, are closer to their original configuration and design.

The ground floor interior of the building is large open space designed originally for commercial and warehouse use. Atop the concrete floor, massive wooden posts and beams support the second story. This support system was clearly designed to carry heavy loads. Clear grain fir posts, measuring 12 inches x 12 inches and 8 inches x 12 inches, resting on concrete piers are spaced in a grid pattern 12 feet on-center running north to south and 20 feet on-center running east to west. The posts support clear grain fir beams measuring 10 inches x 13 inches. The second floor joists are unpainted clear grain fir measuring 3 inches x 11 inches. The floor joists are spaced 8 inches on center and are clearly designed to carry very heavy loads. The second story floor boards are also clear grain fir. The overall visual effect of the massive post and beam construction and tightly spaced exposed wooden floor joists is like a forest and canopy of wood.

The first and second floors were originally connected by a freight elevator and a broad wooden staircase. The stair case is in its original location but was modified in 2004 to meet modern building codes. The second story is an open floor plan reflecting its original use as a storage space. Exposed fir posts, measuring 8 inches x 8 inches and 10 inches x 10 inches, support an exposed roof truss

B-003-001

system. The spans are made of five (5) 2 inch x 10 inch fir boards bolted together; the wooden webbing measures 3 inches x 11 inches; and the chords are solid 12 inches x 12 inches fir lumber. The ceiling rafters measure 3 inches x 11 inches and are spaced 12 inches on-center. Like the ground floor interior, the second story structural system is unpainted wood.

The building was renovated in 2004-2005. The windows voids are unchanged and weatherized glazing was installed. The original interior structural support system is intact. Non-load bearing interior partitions divide the first and second floor interiors but great care was taken to leave the entire wooden structural support system intact and open for viewing. Glazing was installed in two of the roof truss webbings to allow sunlight to flood the upper story work space. The interior staircase is in the original location but was renovated consistent with city building code and ADA standards.

The building has occupied the southeast corner of Columbia and 4th streets for nearly 90 years. During that long period of time the exterior scale, massing and limited ornamentation have changed little. The character defining elements of the interior, the massive wooden support systems is completely intact.

Statement of Significance - In response to criteria:

The W.F. Henkel building is a significant illustration of simple downtown commercial and industrial architecture from the early 20th century. The simplicity of its stripped early modern design and poured concrete construction is a reflection of the desire of Vancouver's World War I era business community to participate in the growth and prosperity of the new 20th century. The emergence of automobile and rapid industrialization are the hallmarks of the early 20th Vancouver and American history and this building is a reminder of the strength and vitality of that era.

1. Association with significant broad patterns or local events. The earliest documentation of a commercial use of the site is the 1888 Sanborn map which identifies a planning mill at this location. The 1889 Polk Directory lists Case Doors and Blinds as the site use and J.P McFarlane and Frank M Davis as the owners. MacFarlane, a Michigan native, formed and operated the Michigan Lumber Company. On June 9, 1902, according to the Landerholm Chronicles, the building burned to the ground at 4:00 AM. Prior to the fire, the building was 'closed due to litigation" and the Michigan Lumber company liquidated its assets to FW Ledbetter and HL Pittock. The 1907 and 1911 Sanborn maps indicate that the property was not in use. The Polk Directories from 1916 – 1919 indicate that 215 W 4th Street was occupied by and Red Front Livery.
   Just as the horse and buggy was replaced by the automobile, so was the livery replaced with a new automotive showroom and repair building. The 1920 county tax records show a $2,500 increase in improved property value on the site over the previous year indicating that the present building was constructed and opened. The property owner was W.F. Hankel. The 1921 Polk Directory contains a listing for the W.F. Hankel & CO – truck Headquarters, Hankel & Company sold and services GMC trucks, Samson tractors and Scripps-Booth Motor Cars out of the ground floor showroom. In addition, Hankel distributed BF Goodrich truck tires, operated a machine shop and, because industrialization and the auto had not completely conquered the area, the company had a blacksmith operation.

B-003-001

The building was clearly designed to house retail in the front (4th Street side) and storage in the back and in the upper story. Large storefront windows face 4th and Columbia streets inviting passers-by to come in and see the latest in modern transportation design. The storage garage door was located at the southern end of the Columbia Street façade and provided direct access to the freight elevator, designed to lift cars, tractors and heavy equipment to over-engineered second story floor.

The 1920s were a boom time in America and in Vancouver as the country and the region reaped the benefits of the economic recovery following the end of World War I. Employment and industrialization were on the rise and in downtown Vancouver "substantial new buildings seemed to rise up like mushrooms after a spring rain". (Bill Alley – History Link – www.historylink.org) W.F. Hankel and Company served the local buying public with the latest in automotive equipment from their new building at 215 W 4th Street for a time. The 1928-1929 Polk Directory shows Lineman Motors and Automotive Dealers operated out of the building.

The effects of the great economic contraction of 1929 are reflected in the use of this building. As money became tighter people turned from purchasing large consumer goods, such as automobiles and tractors, to filling more basic needs – buying food. In 1929 Western States Grocery Company replaced Lineman Motors and operated out of this building until 1934. Between 1934 and 1938, the depths of the great Depression, Hudson and Duncan Company, another wholesale grocer owned the building. In 1954 "Hudson House" is listed as the owner and occupant on a Vancouver building permit. Hudson House appears as the owner and occupant of the building until 1964.

Beginning in 1956, Hudson House leased warehouse space to the Lucky Lager Brewery of Vancouver, WA. Lucky Lager Brewery opened its downtown Vancouver plant with its iconic red 'Lucky Lager' sign, in 1950. Lucky Lager and its parent General Brewing Company operated brewing plants in Azusa, California, Salt lake City, Utah and Vancouver, WA. During the 1950s and early 1960s Lucky Lager was the beer sales leader in the Western United States. [1] The building at 215 W. 4th Street City of Vancouver permits show that Lucky Lager continued to lease warehouse space in this building through 1972. Lucky Lager closed its Vancouver operations in 1985. 215 W. 4th Street was one of the original Lucky Lager warehouses and perhaps the last to close down.

From 1964 through 1979, Grover's Electric occupied the building ground floor as a retail sales shop and equipment storage area. Historic photographs from 1964 and 1967 show that Grover Electric may be responsible fro removing the bricks from the storefront windows as well as interior electrical and plumbing improvements. Brian Hall Pro Caliber Motor Sports occupied the ground floor from 1994 – 2007. Wallis Engineering is the current owner and has made a significant investment in renovating the building in keeping with its original character.

[1] "Eugene Selvage Retires as President of Lucky Lager." Humboldt Standard 03 March 1961: Pg 9.

B-003-001

2. Distinctive architectural characteristics. The building, as built by W. F. Hankel in 1920 and seen today, is an excellent example of function over form and style. The building was designed and built in the post WWI era as America and Vancouver built an automobile driven society. The building was designed with large ground floor showroom windows so that passers-by, whether walking or driving, could steal a glance into the auto showroom to see the latest transportation marvel. The building is striped of all ornamentation except for the stepped parapet wall in the primary façade on facing 4th street. Concrete is the medium of choice for the exterior walls. The large garage door on the Columba Street side allowed easy access into the storage area and a heavy-duty freight elevator the dealer to over merchandize easily between floors. The rectangular second story windows are simple openings whose purpose is to illuminate the second story not to add embellishment or architectural interest. The character defining elements of the building are its simple exterior form, open floor plan, and oversized wooden support system. Every element is designed to enhance the function of the building, i.e., to showcase merchandise and facilitate its interior movement and storage.

3. Reflects elements of the county's history. In the early 20th century, nearly every small American city reinvented itself and learned to accommodate and embrace the transformation into the auto and modern industrial era. The W.F. Hankel building is such a place where downtown Vancouver embraced the modern era and moved from Red Front Livery Stable to automobile sales and service. When the county economy staggered badly in 1929, the building accommodated the changing market demands and switched from auto sales to wholesale grocery sales. When Lucky Lager opened its brewery plant in downtown Vancouver, the building at 215 W 4th Street offered its super-engineered second story as a convenient brewery warehouse. Lucky Lager closed its Vancouver plant and nearly all evidence of its iconic presence in downtown Vancouver is gone except, perhaps, for the building t 215 W 4th Street. As downtown Vancouver is experiencing a rebirth of commerce while American and the region embrace green technology. Today, a local engineering firm has carefully renovated the buildings interior and exterior character defining elements while installing the modern green technology elements of interior design. As always, 215 W 4th Street has managed to keep pace with the changing commercial times.

Hines, Maurice

From: Newt Rumble [Newt@vancouvercpa.com]
Sent: Friday, October 21, 2011 6:18 PM
To: Columbia River Crossing
Subject: Concerns about CRC FEIS - Draft comments

B-004-001

I am opposed to this project on many fronts. I have not always had such concerns, and have been following it from inception. However, in the last 9 months the plethora of information which has been released following various FOIA requests has caused me to be in opposition.

There is no doubt that this geographic region has serious transportation impediments related to an overcrowded I-5 traffic corridor. This has negatively affected commerce, and economic development in the area. It also places the area at risk in the event of natural disaster and/or security concerns.

However, this CRC project, clearly, will not solve any of these concerns – except for the construction of a crossing that is more seismically protected. A simple review of the information considered by the planning council and sponsor agencies, and the information provided by selected and highly compromised project managers and vendors demonstrates that the CRC project will not improve daily traffic flows north and south bound between the Portland metro area and Clark County, let alone to the greater SW Washington area.

B-004-002

The historic connections between area transportation agencies and municipalities with the Project Contractor and Manager (David Evans and Associates) raises concerns about independence, oversight, predetermined selection and design review processes, conflict of interest, management effectiveness, and cost control.

The project activity to date has been highly mismanaged and characterized by a lack of transparency, with various community and elected officials being spoon fed selective information to insure decision making consistent with the interests of the contractors, agencies and their staff, and perhaps even certain private parties. There are instances, involving significant amounts of money, where Contractor David Evans and Associates engaged entities who were already under separate contract to the project to perform services, which were then billed back to the CRC project and then subject to a 4% profit markup by DEA.

Data in conflict with the planning agencies and managers predetermined goals has been ignored, misinterpreted, and/or miscommunicated in efforts to create a "need" for all aspects of the project, including light rail.

B-004-003

The CRC project, as part of its federal funding mandate, required consensus among the sponsor agencies throughout the planning phase as a prerequisite to major design and planning conclusions. In the absence of

B-004-001

The independently validated results of the project traffic modeling show clear improvements in travel time, congestion relief, auto emissions, and safety. Please see Section 3.1 for details.

B-004-002

The NEPA process has considered all relevant and available information regarding alternatives and impacts.

Effective and fair program and agency management and decision-making are critically important, but they are not appropriate issues to be evaluated in the environmental review and NEPA process. If you have specific concerns about these issues please contact WSDOT directly.

B-004-003

See the response to comment B-004-002 above. The FEIS describes the rationale for, and benefits from, including light rail transit (see Chapter 2 and Section 3.1 in particular).

B-004-003 specific leadership, this consensus requirement has allowed individual agencies to hold the project design and planning "hostage" to their various special interests, in spite of questionable cost/benefit considerations to the other agencies and the general public. Most notably this would be applied to the decision to add light rail to the project – a concept ostensibly sold as a requirement of federal funding; but in truth a requirement only of sponsor agency Metro, but used in the construct of the consensus mandate, it appears instead as a federal mandate.

B-004-004 The funding resources to pay for the construction, including tolling projections were understated and undisclosed, creating a perception of purposeful obfuscation to avoid the negative backlash that would occur and which might cause the CRC project's viability to be questioned.

B-004-005 This region has known for more than 30 years that most viable solution to the I-5 congestion problem follows the "Western Bypass" concept. The "Western" solution solves numerous environmental, social, economic, and logistical concerns raised in the current project, for significantly less and more predictable costs. Yet, it is routinely disregarded, and was in this case, because it had little direct benefit to certain agencies, most notably the Portland Bureau of Transportation and the Portland Bureau of Planning and Sustainability. Both of these agencies input is tainted by decisions and efforts within the project to increase urban densification and mass transit – in spite of a plethora of research nationwide and internationally that show that both efforts increase transportation costs, housing costs, and are characterized by an underutilization of mass transit. The "Western" route would open up commercial and industrial development along I-5 from Ridgefield to Kalama, an area with economic and practical availability of land, labor, community resources and a labor force characterized by high under-employment and unemployment.

B-004-006 The project is characterized by no single project leader, which has led to huge cost over runs, or underestimations of minimally necessary costs from inception. However, information from the project seems to indicate such understatements are part of a "palatability" rinse of the project to insure it's acceptance by the general public and to keep the true cost and mismanagement of the project from public scrutiny. The project's fiscal controls and accountability do not begin to approach even the lowest standard applied to federal grants as established by PL 104-156. This standard, affecting the audits of States, local governments, and non-profit organizations expending Federal funds, describes accountability and controls that are minimally acceptable in order for the financial transactions of the entity to be audited and receive an opinion that the entity and its financial operations are stated in such a manner as to be materially accurate, and the operations that produced the transactions are managed, with suitable oversight so as to be materially free of risk of misstatement, error, or malfeasance. The project has no single entity that has taken the responsibility for managing and/or reporting to the public on the sources and

B-004-004

Please refer to Chapter 4 of the FEIS for a description of the current plans for funding construction and operation of the LPA. This discussion provides an updated assessment of likely funding sources for this project. As described in the FEIS, project funding is expected to come from a variety of local, state, and federal sources, with federal funding and tolls providing substantial revenue for the construction.

The project has not attempted to minimize the costs of the project. In fact, there are many estimations, such as property acquisitions, that have been made rather conservatively. There are a number of properties that the project will work to avoid or minimize impacts to. Some of these properties, because we are uncertain if we will be able to avoid them as design advances, are shown as displacements in the FEIS and included in acquisition cost estimating.

Governors Kitzhaber and Gregoire, and Oregon and Washington legislators have made it clear that they will review every element of this project and provide oversight and accountability. The governors and legislative leaders are discussing the scope of interim legislative oversight committees. At Governor Kitzhaber's request, the Oregon State Treasurer conducted an independent review of the CRC's financing plan and released a report in July 2011. CRC incorporated the treasurer's recommendation in Chapter 4 of the Final EIS.

B-004-005

New corridors, including a "western bypass", were among ideas and proposals evaluated early in the CRC development process, as discussed in Section 2.7 of the FEIS.

B-004-006

The project is currently undertaking an audit, which is being conducted in addition to the normal and customary financial controls for a project of

B-004-006 uses of nearly $155 million of public funds, in spite of the fact that the total expenditure includes over $90 million expended to David Evans and Associates, which is about 80% more than the amount of their original contract. Indeed, the coordinating organization, the Columbia River Crossing Project office asserts that they and the agencies have no requirement for accountability because the area "project office" is not a reporting entity. The extreme shallowness of such an attitude should play havoc with every citizen's faith in the role of governance. In every instance of major construction project conception – from project owner to contractor management to project supervision, yea even to task supervision – accountability and fiscal reporting is the industry standard for ensuring project timeliness and profitability and cost effectiveness. There simply are no exceptions! At least none that would stand the test of scrutiny! The tragedy in such a comment is that it displays the reckless spending and casual ownership that is far too often taken for granted by public sector employees with regard to their responsibility to their "shareholders", i.e. the taxpaying public.

To conclude:

B-004-007
- The region needs an additional interstate commerce byway to improve transportation flow in the area.
- Whether by "Western Route" or "Eastern Route" (a more short sighted concept than the former), either would be more practically and economically palatable to the congestion problem faced on the existing connection or a successor at the same site.
- Under any alternative, there is no doubt that the I-5 bridge needs to be replaced and likely expanded, along with design corrections to a hodge podge of freeway access points that have been cobbled together over a 60 year period along the crowded Portland metro corridor.
- The present CRC project barely accomplishes the replacement need, without addressing the transportation and congestion and economic development components, at an extremely high price; and leaves the region continually vulnerable to the problems of limited crossing alternatives in a metropolitan area of 2.7 million people.

B-004-008
- The existing CRC project as outlined in the FEIS is driven outside of reasonable financing boundaries by design flaws, and project add ins, like light rail

B-004-009
- The SW Washington area has repeatedly rebuffed light rail proposals for the area. It is time to take this issue off the table, and give the people what they need, and have expressed as "what they want" – or don't – as the case may be.
- The people of SW Washington do not want urban densification, do not want time consuming and expensive transportation alternatives, and do want a system that will improve the flow of commerce up and down the greater west coast interstate highway system.

Sincerely,

this type. Inquiries about particular financial issues should be sent to the project office. The expenditures to date are generally in line with a project of this size. The project has managed to reach agreement on many issues among many jurisdictions. Additionally, the project has nearly completed the NEPA environmental analysis, has reached nearly 30% design, has conducted an extremely thorough outreach effort, and has completed considerable geotechnical and other pre-construction testing. WSDOT and other sponsoring agencies have taken financial accountability very seriously and do have the records of such management. The joint management structure has actually been a cost saving measure rather than an effort to obfuscate spending.

B-004-007

Mr. Rumble comments that the I-5 CRC project alone is not enough to solve a number of regional transportation and other needs. This is acknowledged. The CRC project is intended to address the specific needs identified for this portion of the corridor and region, as described in Chapter 1 of the FEIS. It addresses these needs and has independent utility, but it does not address other transportation needs in the region.

B-004-008

The project has worked with local decision makers to balance the need to reduce costs and yet provide a comprehensive solution. Light Rail is a critically important part of the project, supported by all local agencies, and by locally adopted plans.

B-004-009

Light rail has been endorsed by every local Sponsoring Agency (Vancouver City Council, C-TRAN, RTC, Portland City Council, TriMet, and Metro), whose boards include elected leadership from throughout the area.

Newt Rumble, CPA
Peterson & Associates, P.S., CPA's
P.O. Box 65009
7919 NE Hazel Dell Avenue
Vancouver, Wash. 98665-0001
phone: 360-574-0644 fax: 360-573-4499

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Annual light rail passenger trips crossing the I-5 bridge in 2030 are projected to be 6.1 million, with daily ridership around 18,700. The travel time for the morning commute by light rail between downtown Vancouver and Pioneer Square in downtown Portland will be approximately 34 minutes. Light rail would travel on a dedicated right-of-way, with more reliable travel times than auto drivers dealing with unpredictable road conditions, traffic congestion, and parking challenges.

The CRC project planning for light rail incorporates and supports the principles of the Vancouver's City Center Vision Plan. Downtown Vancouver has seen recent growth in higher density mixed use projects from three to 12 stories in height. In addition, another 4,000 downtown condominiums are proposed or pending as part of new developments. The core of Vancouver has, along with many of the larger corridors such as Fourth Plain Blvd, medium to high density residential development and an urban mix of uses. Transit demand in these areas is quite high, and ridership will increase with the introduction of light rail.

Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on having a public vote.
The ability to efficiently move freight in the Vancouver/Portland region is critical to the overall health of our economy. As such, the CRC project is designed to improve freight mobility on I-5, as well as make it safer and easier for trucks to get on and off I-5 to reach businesses and Port facilities. The Freight Working Group (FWG), comprised of representatives of the Vancouver-Portland metropolitan area's freight industry, met 22 times throughout the DEIS and FEIS development process to advise and inform the Columbia River Crossing project team about freight issues. The group provided insight, observation, and recommendation about the needs for truck access and mobility within the corridor; characterized the horizontal and vertical clearances, acceleration/deceleration, and stopping performance needs of trucks that

must be accommodated; and provided meaningful comments on the effect of geometric, regulatory, and capacity changes on truck movements in the corridor. See Chapter 3 (Section 3.1) of the FEIS for detailed discussion of how the project increases freight mobility and access along I-5 and in the region.

JUBITZ CORPORATION

RECEIVED
OCT, 14 2011
Columbia River Crossing

October 13, 2011

Columbia River Crossing Project
700 Washington Street
Suite 300
Vancouver, WA 98660
Attn.: Heather Wills, CRC Environmental Manager

Re: Columbia River Crossing (CRC) Project EIS

Dear Ms. Wills:

B-005-001

Following is written comment from Jubitz Corporation ("Jubitz") with respect to the replacement of the I-5 Columbia River Bridge project ("Project") and the Final Environmental Impact Statement (EIS) published September 23, 2011. Our comments are timely within the 30-day review/comment period, and refer specifically to proposed highway improvements in North Portland associated with the Project, to wit: the proposed Martin Luther King Blvd. ("MLK") off-ramp connection to N.E. Union Court/Union Court.

Background.

Since 1958, Jubitz Corporation has operated a truck stop at the Jubitz Travel Center located at 10210 N. Vancouver Way. Our present facility covers 24 acres, generally serving 1000(+) trucks per day. The bulk of our over-the-road highway traffic comes from the I-5 freeway, with additional material daily truck traffic from the Port of Portland loading areas West of I-5. Other trucking companies in our immediate vicinity which also produce large I-5 truck traffic counts are Market Transport (110 N. Marine Drive), Haney Truck Line (10505 NE 2nd Avenue) and USF Reddaway (10510 N. Vancouver Way).

Jubitz is generally in support of the CRC bridge replacement as presently designed. The bridge replacement should help alleviate the current congestion in the I-5 bridge vicinity, and will facilitate commercial trucks accessing I-5 from our general area.

Jubitz objects, however, to the current proposed configuration for commercial trucks accessing our facility or other proximate trucking locales from I-5 via Martin Luther King Blvd. ("MLK"). Specifically, the current proposal utilizes an extended loop off-ramp from MLK to connect with N. Hayden Meadows Drive and NE Union Court before passing underneath MLK to connect with N. Vancouver Way. This differs from the earlier MLK off-ramp configuration described by **Option 12 Modified** (see "Marine

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B-005-001

Several designs have been considered for reconfiguring access to I-5, and across I-5, from the east through the Marine Drive interchange area. All of the options have advantages and disadvantages. The project will continue to attempt to minimize adverse impacts to all resources and property owners as much as practicable. We urge Jubitz and other stakeholders to continue to coordinate with ODOT and the project to determine if there are refinements or measures that can be implemented to reduce the impacts Mr. Stibolt outlines in this letter.

There will be additional out-of-direction travel for vehicles from I-5 to Jubitz but the proposed local street network provides good intersection spacing on Vancouver Way which will improve traffic operations. There is no out of direction travel for vehicles destined to the interchange from Jubitz – the distance is virtually the same compared to existing. There is actually some improvement by removing the out of direction loops on the existing northbound entrance ramp. The access between MLK Jr. Blvd and Marine Drive and Vancouver Way is improved by adding acceleration and deceleration length on the connections and appropriate weave distance between the connections and the interchange. The proposed layout simplifies the network by providing better spacing in the connections to redesign the three streets that currently connect near the interchange.

B-005-001

Drive Interchange Alignment Recommendation Process—Final Summary Report and Stakeholder Recommendation" published October 2009, File ID 771). Option 12 Modified utilizes a substantially shorter and simplified MLK off-ramp to connect with Union Court and the N. Vancouver Way area.

Our objections to the current proposal v. Option 12 Modified include the following:

- The current proposed configuration unnecessarily adds 2400 feet (.45 mile) of additional truck driving distance, resulting in increased fuel consumption and costs for each truck exiting I-5 to access Jubitz and other area trucking centers.
- The current proposed configuration unnecessarily results in the emission of additional greenhouse gases due to additional drive distance.

Discussion.

THE PROPOSED CONFIGURATION UNNECESSARILY ADDS 2400 FEET (.45 MILE) OF ADDITIONAL TRUCK DRIVING DISTANCE RESULTING IN INCREASED FUEL CONSUMPTION AND ASSOCIATED COSTS.

Contrary to the Option 12 Modified plan, the proposed MLK off-ramp results on excess fuel consumption due to extended off-ramp distance with resulting costs to commercial trucking. In addition to distance alone, the current configuration adds a third intersection necessitating truck stoppage and starting. Compared to Option 12 Modified, it is estimated that the combination of distance plus additional fuel consumption due to required truck acceleration due to the added intersection may result in up to an additional .17 gallons of fuel burned by each truck utilizing the off-ramp. Positing an average figure of 1000 trucks per day accessing Jubitz plus a conservative estimate of an additional 500 trucks generally accessing other local trucking destinations from I-5, this results in an additional daily consumption of 255 gallons of diesel fuel, or over 93,000 gallons per year. Applying current and anticipated diesel fuel pricing of approximately $4.00/gallon, the proposed configuration results in additional costs of over $370,000 per year to access local truck locations.

THE PROPOSED CONFIGURATION RESULTS IN THE UNNECESSARILY EMISSION OF ADDITIONAL GREENHOUSE GASES DUE TO ADDITIONAL DRIVE DISTANCE.

As described above, utilizing an average figure of 1500 trucks per day, the proposed MLK off-ramp configuration will burn 93,000(+) additional gallons of diesel fuel per year to cover the additional 675 miles (.45 miles x 1500) of off-ramp distance. This results in unnecessary emissions of greenhouse gases otherwise avoided by Option 12 Modified.

B-005-001

October 2009 Marine Drive Interchange Alignment Recommendation.

A review of the October 2009 Recommendation of **Option 12 Modified** includes multiple findings as well as analyses supporting the recommended design. These findings have not been changed, and remain compelling reasons to adopt the Option 12 Modified proposal

Summary.

Discussions with CRC Committee representatives indicate that considerations for the currently-proposed MLK off-ramp configuration include potential interference with a deeded dog park area, visual proximity of the Option 12 Modified N.E. Union Court intersection to Delta Park softball fields, potential close juxtaposition of the Option 12 Modified N.E. Union Court intersection with the (new) N. Vancouver Way intersection,[1] and maximizing the space between the I-5 intersection and a connection with N.E. Union Court. Particularly with respect to the final point, Jubitz believes its above-described objections renders the current proposed off-ramp configuration inferior to the **Option 12 Modified** MLK off-ramp design.

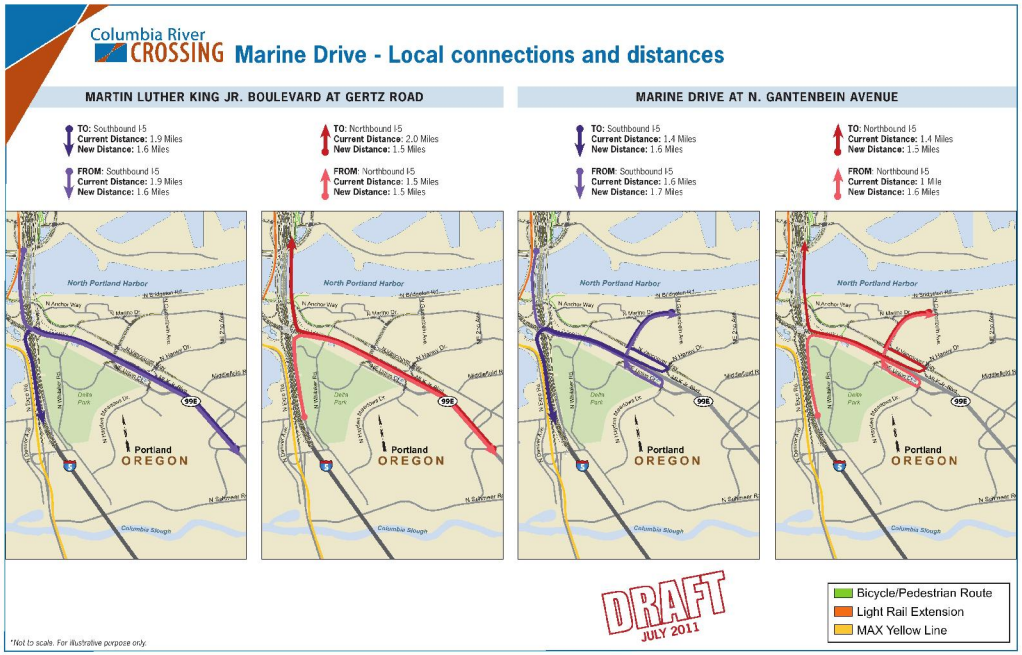
I would appreciate an opportunity to discuss our comment with you.

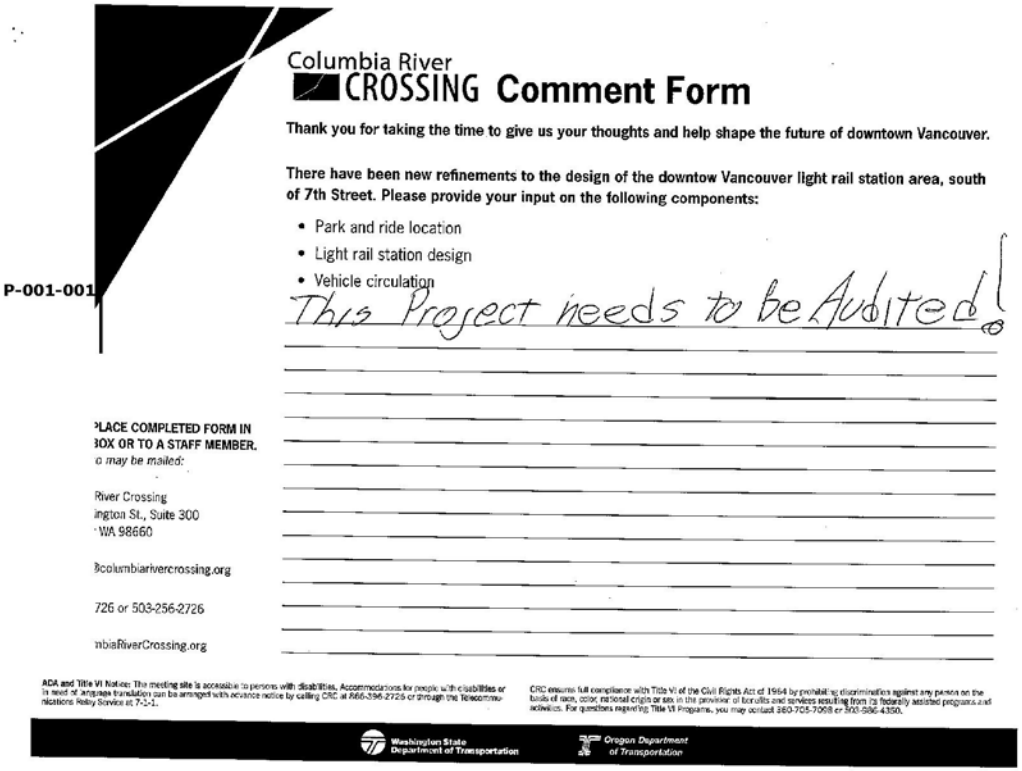
Sincerely,

Victor D. Stibolt
Vice President Administration & General Counsel
(503.345.0313)

cc: Aaron Myton, P.E., Columbia River Crossing Committee
Gary Wilson, Market Transport
Pat Roetker, Asst. Terminal Manager USF Reddaway
Haney Truck Lines
Corky Collier, Executive Director Columbia Corridor Association

[1] This objection by CRC Committee presumes both intersections will be governed by traffic lights. While a traffic signal will be reasonably required for N. Vancouver Way, the Union Court intersection under Option 12 Modified may well be better served through use of simple stop signs which have adequately served all truck traffic currently accessing N. Vancouver Way from I-5.


Columbia River CROSSING
Marine Drive - Local connections and distances
MARTIN LUTHER KING JR. BOULEVARD AT GERTZ ROAD
TO: Southbound I-5
Current Distance: 1.9 Miles
New Distance: 1.6 Miles
FROM: Southbound I-5
Current Distance: 1.9 Miles
New Distance: 1.6 Miles
TO: Northbound I-5
Current Distance: 2.0 Miles
New Distance: 1.5 Miles
FROM: Northbound I-5
Current Distance: 1.5 Miles
New Distance: 1.5 Miles
MARINE DRIVE AT N. GANTENBEIN AVENUE
TO: Southbound I-5
Current Distance: 1.4 Miles
New Distance: 1.6 Miles
FROM: Southbound I-5
Current Distance: 1.6 Miles
New Distance: 1.7 Miles
TO: Northbound I-5
Current Distance: 1.4 Miles
New Distance: 1.5 Miles
FROM: Northbound I-5
Current Distance: 1 Mile
New Distance: 1.6 Miles
North Portland Harbor
Portland
OREGON
Columbia Slough
DRAFT
JULY 2011
Bicycle/Pedestrian Route
Light Rail Extension
MAX Yellow Line
*Not to scale. For illustrative purpose only.



Columbia River
CROSSING **Comment Form**

Thank you for taking the time to give us your thoughts and help shape the future of downtown Vancouver.

There have been new refinements to the design of the downtow Vancouver light rail station area, south of 7th Street. Please provide your input on the following components:

- Park and ride location
- Light rail station design
- Vehicle circulation

P-001-001

This Project needs to be Audited!

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Washington State Department of Transportation

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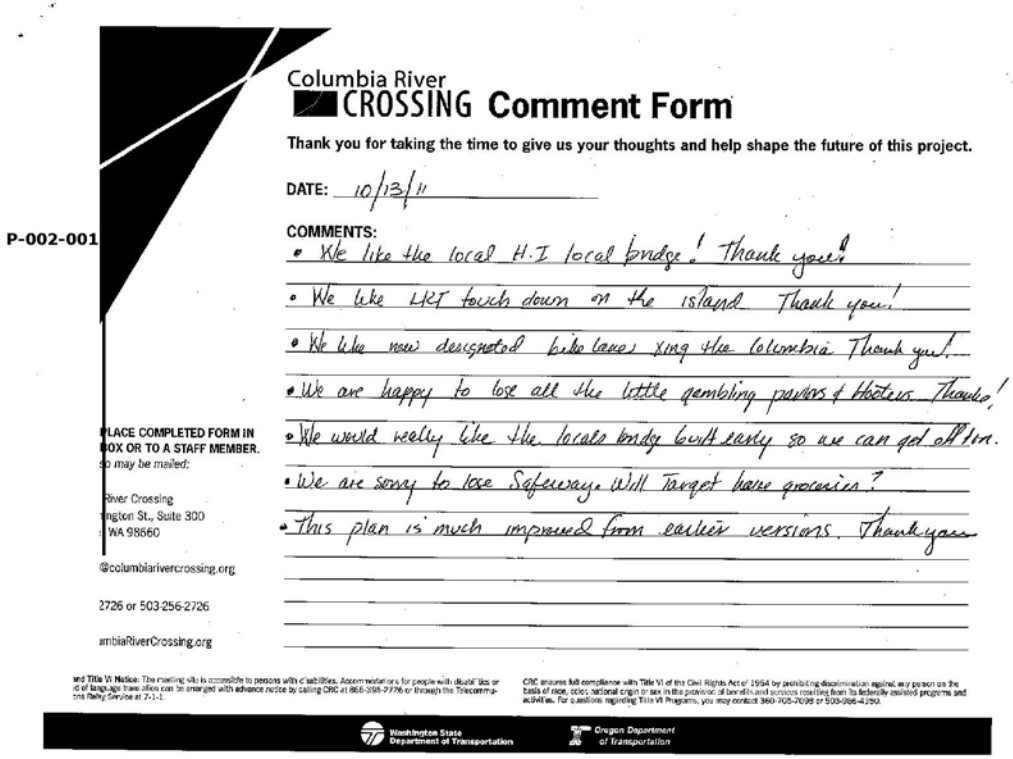
P-001-001

The project is currently being audited and the results will be made available to the public. If you have specific questions about project expenditures, please contact the project office.



Columbia River
CROSSING **Comment Form**

Thank you for taking the time to give us your thoughts and help shape the future of this project.

P-002-001

DATE: 10/13/11

COMMENTS:

- We like the local H.I local bridge! Thank you!
- We like LRT touch down on the island Thank you!
- We like new designated bike lanes xing the Columbia Thank you!
- We are happy to lose all the little gambling parlors & Hooters. Thanks!
- We would really like the locals bridge built early so we can get off Hay.
- We are sorry to lose Safeway. Will Target have groceries?
- This plan is much improved from earlier versions. Thank you

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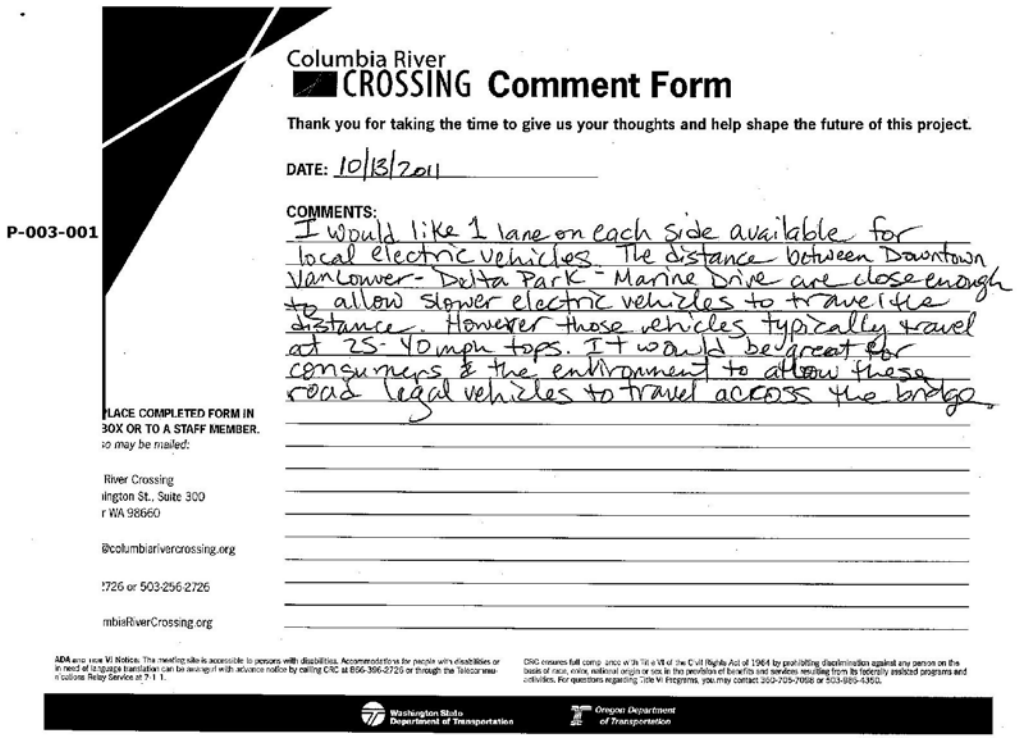
P-002-001

Thank you for your review of the recent design and appreciation for its refinements. Early construction of the local multimodal bridge between Marine Drive and Hayden Island, so that it can be used as an alternate access route during the remaining construction period, will be analyzed during final design. In order for the local multimodal bridge to be built early, the Marine Drive interchange reconstruction also needs to occur so that Marine Drive can be elevated, allowing the light rail extension to cross under Marine Drive. The Marine Drive interchange is expected to take a little more than 3 years to construct, including work at the Victory Boulevard interchange.



Columbia River
CROSSING **Comment Form**

Thank you for taking the time to give us your thoughts and help shape the future of this project.

DATE: 10/13/2011

COMMENTS:

P-003-001

I would like 1 lane on each side available for local electric vehicles. The distance between Downtown Vancouver - Delta Park - Marine Drive are close enough to allow slower electric vehicles to travel the distance. However those vehicles typically travel at 25-40 mph tops. It would be great for consumers & the environment to allow these road legal vehicles to travel across the bridge.

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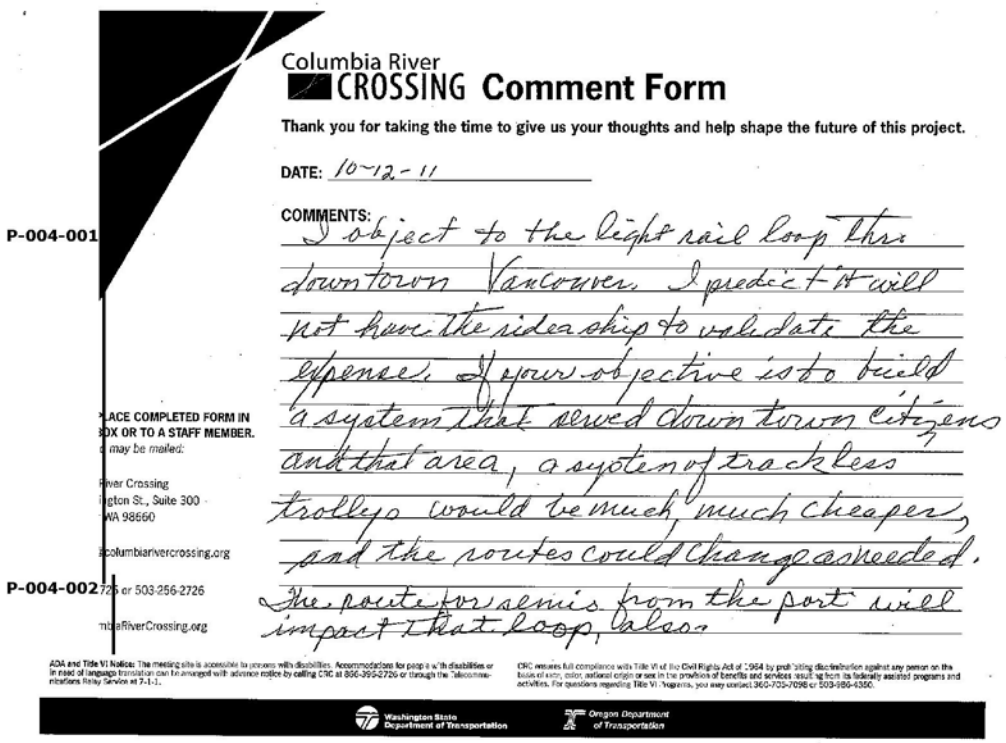
Washington State Department of Transportation | Oregon Department of Transportation

P-003-001

Interstate facilities do not allow neighborhood electric vehicles (NEVs). However, the new local multimodal bridge between Hayden Island and the Oregon mainland will be designed for a lower speed, and will likely be used by NEVs. Because the project supports the use of electric vehicles, when parking management plans are developed for the park and ride facilities, the provision of electric charging stations will be evaluated.



Columbia River
CROSSING **Comment Form**

Thank you for taking the time to give us your thoughts and help shape the future of this project.

DATE: 10-12-11

COMMENTS: I object to the light rail loop thru downtown Vancouver. I predict it will not have the ridership to validate the expense. If your objective is to build a system that served downtown citizens and that area, a system of trackless trollys would be much, much cheaper, and the routes could change as needed. The route for semis from the port will impact that loop, also.

P-004-001

P-004-002

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P-004-001

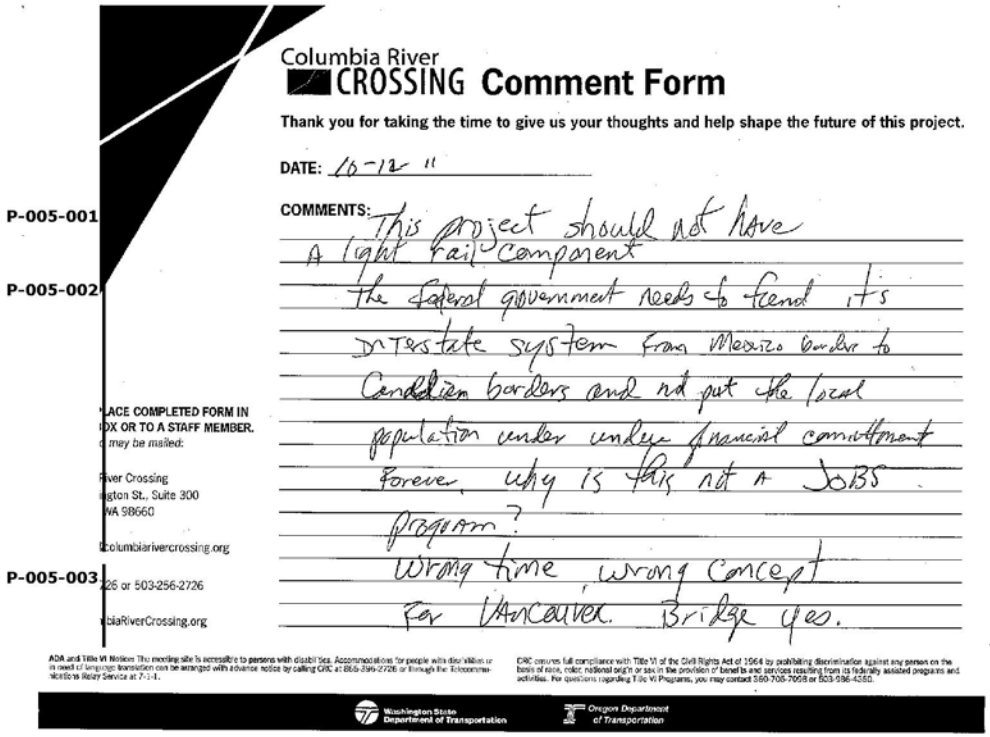
Following the close of the 60-day DEIS public comment period in July 2008, the CRC project's six local sponsor agencies selected light rail to Clark College as the project's preferred transit mode. These sponsor agencies, which include the Vancouver City Council, Portland City Council, C-TRAN Board, TriMet Board, RTC Board and Metro Council, considered the DEIS analysis, public comment, and a recommendation from the CRC Task Force before voting on the LPA. (The CRC Task Force included a broad group of stakeholders representing a range of interests affected by the project - see DEIS Appendix B, Public Involvement, for more information).

Light rail is more likely than other transit options to attract desirable development in downtown Vancouver, which is consistent with local land use plans.

Following the selection of the LPA in July of 2008, the CRC enlisted the help of community members - residents, business owners, transit-dependent populations and commuters - who had interest in light rail planning to form the Vancouver Working Group (VWG). The VWG met regularly to develop recommendations and provided feedback to the CRC project, the City of Vancouver and C-TRAN on transit alignments, proposed station locations and design, security and park and ride facilities in downtown Vancouver. Following approximately 5 months of coordination, in addition to public open houses and walking tours, the VWG recommended the Washington-Broadway Couplet through downtown Vancouver to C-TRAN and City of Vancouver staff. Per the Vancouver Working Group Final Report (October 2009), this alignment was preferred largely because it spread the potential impacts and benefits across two streets, as opposed to concentrating them on a single street. This alignment was adopted as part of the LPA and is analyzed in the FEIS. For more information on the transit alignment decision-making process please see Chapter 2 (Section 2.7) of the FEIS.

P-004-002

Thank you for thinking of freight mobility, which is an important purpose of the project. The traffic modeling done for the City shows improvements to many intersections, even with frequent light rail service. The routes for trucks have been particularly important. Working with the freight and trucking community, the project has identified many current design problems, and has included improvements related to these, especially at Mill and Fourth Plain Boulevards in Vancouver, as well as Marine Drive in Portland.



Columbia River
CROSSING **Comment Form**

Thank you for taking the time to give us your thoughts and help shape the future of this project.

DATE: 10-12-11

COMMENTS: This project should not have A light rail component the federal government needs to fund it's Interstate system from Mexico border to Canadian borders and not put the local population under undue financial commitment forever. Why is this not a JOBS program? Wrong time, wrong concept for Vancouver. Bridge yes.

P-005-001

P-005-002

P-005-003

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P-005-001

Preferences for specific alternatives or options, as expressed in comments received before and after the issuance of the DEIS, were shared with local sponsor agencies to inform decision making. Following the close of the 60-day DEIS public comment period in July 2008, the CRC project's six local sponsor agencies selected a replacement I-5 bridge with light rail to Clark College as the project's Locally Preferred Alternative (LPA). These sponsor agencies, which include the Portland City Council, Vancouver City Council, TriMet Board, C-TRAN Board, Metro Council, RTC Board, considered the DEIS analysis, public comment, and a recommendation from the CRC Task Force when voting on the LPA.

With the LPA, new bridges will replace the existing Interstate Bridges to carry I-5 traffic, light rail, pedestrians and bicyclists across the Columbia River. Light rail will extend from the Expo Center MAX Station in Portland to a station and park and ride at Clark College in Vancouver. Pedestrians and bicyclists would travel along a wider and safer path than exists today.

For a more detailed description of highway, transit, and bicycle and pedestrian improvements associated with the LPA, see Chapter 2 of the FEIS.

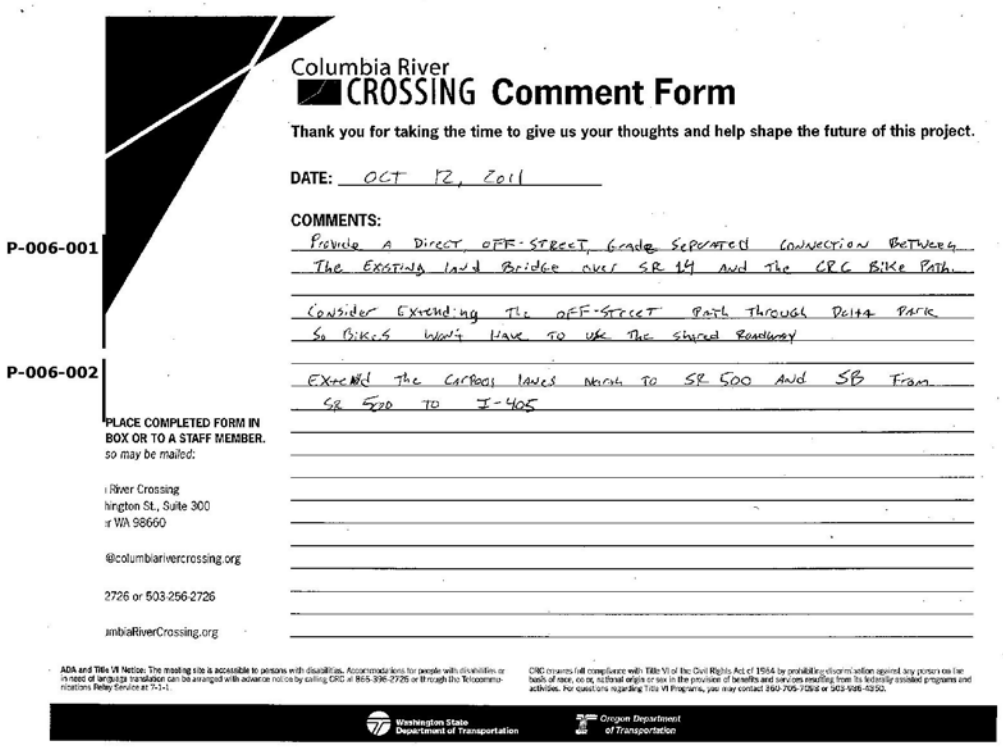
P-005-002

The Interstate provides mobility for more than just long, interstate trips. It provides a main arterial-like crossing for local residents and workers as well. It is therefore a shared responsibility to construct the project and fund it locally (with tolls), at the state and federal levels. The project will, in design and construction, create thousands of jobs.

P-005-003

Light rail is an essential component of the locally preferred alternative,

and is a critical part of meeting the project's purpose and need, as discussed in Chapter 2 of the FEIS. The project is anticipating a combination of federal and state funds as well as toll revenues to pay for construction, as described in Chapter 4 of the FEIS. The project is expected to provide jobs and promote economic activity.



Columbia River
CROSSING **Comment Form**

Thank you for taking the time to give us your thoughts and help shape the future of this project.

DATE: OCT 12, 2011

COMMENTS:

P-006-001

Provide A Direct, OFF-STREET, Grade Separated Connection Between The Existing Land Bridge over SR 14 and The CRC Bike Path.

Consider Extending The OFF-STREET Path Through Delta Park So Bikes Won't Have To Use The Shared Roadway

P-006-002

Extend The CarPool Lanes North To SR 500 And SB From SR 500 To I-405

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P-006-001

Thank you for your comment. The LPA's current design was developed to enhance the biking experience through the project area. Specifically, project staff and advisory committee members focused on the connections between downtown Vancouver and Delta Park, and identified numerous ways to improve the network.

There will be a nearly continuous, off-street connection between the Vancouver National Historic Reserve and the bridges. The Land Bridge crosses over SR 14, and lands in Apple Tree Park. This Park will be directly connected to Main Street. Both Main Street and Columbia Way will lead to the access points with the new bridge.

The project does not include changes to Delta Park's bikeway, but does improve connections in this area. Not only will the project connect better to Delta Park, it will also connect the Marine Drive and Bridgeton Trails to the network.

P-006-002

High occupancy vehicle (HOV) lanes work when they are part of a network, and could potentially be a useful tool in the CRC area if employed as part of a regional plan. The 5-mile CRC project by itself is too short in length to provide the true benefits of HOV lanes, but should the region adopt and develop a HOV system, lanes within the bridge influence area could potentially be designated as part of the network.

The CRC project team has looked at HOV lanes and freight lanes, which are typically located on the inside freeway lane next to the barrier, as part of its technical analysis. Because about 70 percent of the vehicles enter and/or exit I-5 within the 5-mile study area, access to and from a HOV lane or freight lane could create traffic operational problems by increasing lane changes (for example, HOVs entering the freeway and

needing to merge all the way to the inside lane). The results of this analysis are described in more detail in Section 3.1 of the DEIS.

Hines, Maurice

From:	N . [waave@msn.com]
Sent:	Saturday, September 24, 2011 3:48 PM
To:	Columbia River Crossing
Subject:	Important bridge question
Categories:	Blue Category

P-007-001 Hello was just wondering why you have the new bridge accross the river curved? Is that even needed, doesn't that make it much more expensive making the new bridge go straight across the river? Please let me know thank you.

1

P-007-001

It is curved primarily to match with the location of existing interchanges at either end, while allowing traffic to continue using the existing bridge as the new bridge is being constructed. The curve does not add substantial costs and reduces impacts, ROW, and other costs that would be associated with relocating the existing interchanges.

Hines, Maurice

From: cecelia antonio [ceceliaantonio@yahoo.com]
Sent: Tuesday, October 11, 2011 6:06 PM
To: Columbia River Crossing
Subject: Construction logistics

Categories: Red Category

P-008-001

Are they going to build the new bridge and then tear down the old one, or tear down the old one before starting construction on the new bridge ? My real question is, of course, how long are we going to be without a bridge ?

Also, why is this process taking so long ? I think we've been talking about this new bridge now since 2006... and construction isn't planned to start until 2012. Didn't Kennedy expand our space program in 1961 with the goal of putting a man on the moon, and we accomplished that goal in 1969 ? Really, we're not going to the moon here; this is just a bridge...

If you can get back to me, that would be great.

Thanks !
Cecelia

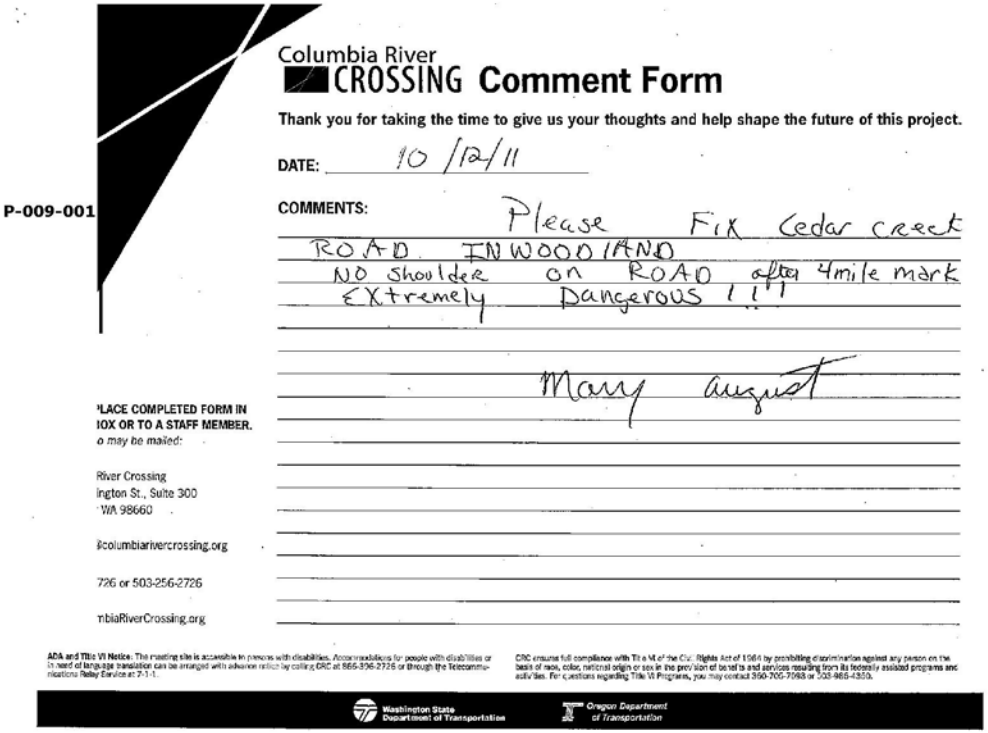
Cecelia Antonio
1331 E Reserve St
Vancouver, WA 98661

1

P-008-001

Three lanes in each direction will be maintained across the river, during peak periods, throughout the duration of construction. The existing bridges will not be taken down until the new bridges are functional and traffic rerouted onto them.

The project was conceived as part of the I-5 Transportation and Trade Partnership study that was completed in 2002. The high capacity transit extension to Vancouver was studied in detail in the 1990s. It does take a long time to plan; design; secure agreements, decisions and funding; and then build large transportation projects. However, the formal NEPA process started only six years ago. Six years is a short period within which to complete the NEPA process for a project of this complexity, and with many sponsoring agencies (including federal highways and transit, two cities, two states, etc).



Columbia River
CROSSING **Comment Form**

Thank you for taking the time to give us your thoughts and help shape the future of this project.

P-009-001

DATE: 10/12/11

COMMENTS: Please Fix Cedar creek ROAD IN WOODLAND NO shoulder on ROAD after 4mile mark EXtremely Dangerous !!!

Mary August

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Washington State Department of Transportation | Oregon Department of Transportation

P-009-001

That location appears to be well outside the scope of the CRC project. However, you may want to contact the City or County and let them know your concern about that particular roadway in Woodland.

From: REX BAHR [mailto:rexbahr@hotmail.com]
Sent: Friday, September 23, 2011 6:58 PM
Cc: FEDERAL DEPT TRANSPORTATION; GOV OREGON; Jefferson Smith; Lars Larson; Sen Monroe; VIEWERS-VOICE KATU-2; Congressman Earl Blumenauer; CNN .COM; CITYINFO POORTLAND; Columbia River Crossing
Subject: Re: September 2011 Project eUpdate - Final EIS available

P-010-001 If you put a $ toll on all the bridges, a 8.5% sales tax in Oregon & a $0.25 tax on ground based fuel you would not even need a new bridge.
The money to be to support almost FREE mass transit.
The traffic on I-5 would fall by half.

P-010-002 To get traffic moving on the interstate do like Texas.
On the overpasses place signs = the left lane 85 the next right 75 the next right 65 and the far right 45
The trick is to get people to where they want to go.
If a person is driving from Salem to Seattle they should be able to cruise at 85 to Seattle all the way.
Rex R. Bahr

P-010-001

Thank you for suggesting creative approaches to meeting the project's purpose and need. However, it is not within the purview of the project to institute a sales tax in Oregon or to increase the gas tax.

P-010-002

During the project screening phase, ideas such as this were considered. And the two states may yet adopt such an approach at a regional level. However, it is difficult to do so within the CRC study area because the interchanges are very tightly spaced. Motorists will, of their own volition, use far left lanes for through trips, and the project has not included any left side ramps. But the project also does not want to encourage unnecessary weaving within the project area.

From: REX BAHR [mailto:rexbahr@hotmail.com]
Sent: Tuesday, October 11, 2011 11:35 PM
Cc: DOT COMMENTS; Eileen portland traffic; FEDERAL DEPT TRANSPORTATION; CNN .COM; Congressman Earl Blumenauer; GOV OREGON; IMMIGRATION,Roy Beck; Jefferson Smith; KANDU KID; Lars Larson; lightout LIGHTOUT; OutragedPatriots DANHOWARD; Sen Monroe; VIEWERS-VOICE KATU-2; Columbia River Crossing
Subject: Re: October 2011 Project eUpdate - Learn more about Final EIS Oct. 12 and 13

Why don't you do it SIMPLE or KISS?
A $0.20 tax on all ground base FUEL, $0.10 to fund MASS TRANSIT & $0.10 to the school system and not the overpaid COLLEGE BOYS.
A 8.5 % sale tax, 4% to the schools and 4% to Hospitals and .5% to the business to collect the tax.
AND DO NOT PUT PERIODS AFTER ANY ADDRESS OR ANYTHING AS IT MAKES IT TO HARD TO COPY
When this is done you will not even need a new bridge and in 50 years we/you will need horses, so why waste the money?
I am 76 so I do not need a bridge and I have no need to go anywhere and besides in Oregon it is too expensive to go anywhere
I have to pay my outrageous taxes and water bill
REX ROMAINE BAHR

From: Jesse A. Buss [mailto:jessebuss@gmail.com]
Sent: Friday, October 14, 2011 5:07 PM
To: Morrow, Steve
Subject: Released from eSafe SPAM quarantine: CRC In-Water Work Window variances

Hi, Steve:

P-011-001 I just finished leaving you a voicemail message, and thought I would follow up with a quick email. Regarding the CRC IWWW variances, my question is: is there documentation of the variances being submitted, reviewed, and approved? And, if so, where can I find that documentation? Comment response S-006-003 to the ODFW's DEIS comments states that the CRC project has received a variance from the normal IWWW, but I cannot find any reference to a variance in the FEIS itself.

Thanks for your time and assistance. best,

jesse

P-011-001

Below is the text of the email sent from CRC project staff to the commenter. Enclosed tables referenced in the email are available on the CRC project website.

"Thank you for your question. Over the last 5+ years, the CRC project team has met with staff from ODFW & WDFW as well as NMFS and USFWS as part of the on-going Interstate Collaborative Environmental Process (InterCEP) [http://columbiarivercrossing.org/FileLibrary/GeneralProjectDocs/InterCEPAgreement.pdf]. Extensive discussions occurred in 2009 and 2010 on the In-Water Work Window (IWWW). Thetable I have enclosed was the result of those discussions. This table is also in the CRC Biological Assessment, Table 3-2. In April, 2010, both the ODFW & WDFW InterCEP representatives had agreed in principal with CRC's proposed IWWW and verbally acknowledged their agencies would grant a variance. Formal review and approval of an IWWW variance would occur under the Fish and Wildlife Coordination Act (FWCA) for both Oregon and Washington. The results of these processes are documented as part of permit issuance conditions of the Oregon Removal-Fill permit (ODSL) and the Washington Hydraulic Project Approval (HPA) (WDFW). The CRC project team will apply for regulatory permits such as Clean Water Act Section 404, Oregon Removal-Fill and Washington HPA in early 2012. At that time, ODFW and WDFW will conduct their formal review of the proposed IWWW and make a determination of a variance under the process described above. In the Biological Opinion (BO) issued by NMFS (enclosed), there is a section called "Description of the Proposed Action" that begins on page 3 of the BO. At the bottom of page 6 it describes how and when impact pile driving will occur during construction (September 15-April 15), and shows it in table form (Table 4) on the following page. There was no variance asked for or granted; it was simply considered part of the project and thus part of the impact analysis or incidental take analysis NMFS conducted to prepare their BO. In the BO, the Terms and

Conditions #2(a) i.-iv. (page 80 of the BO) describe peak hydroacoustic noise limits dependent upon time of the year and on the construction and demolition activities that would be allowed year-round.

If you have any further questions or follow-up please do not hesitate to contact me; I am happy to assist."

Hines, Maurice

From: Robert Dean [robert@deansurveying.com]
Sent: Sunday, October 16, 2011 9:04 PM
To: Columbia River Crossing
Subject: CRC FEIS deficient construction impacts
Attachments: donwagnerletter.PDF; ATT13307343.htm

P-012-001

The FEIS fails to adequately address potential or likely adverse impacts due to actual construction on local commerce, residents, small businesses, and regionwide transportation networks.

Attached is a letter I sent to Director Don Wagner in January 2011 with detailed concerns that were not addressed in the FEIS.

Robert Dean
7101 NE 74th Ave.
Vancouver, WA 98662
(360) 892 2600

Sent from my iPhone

Begin forwarded message:

From: Robert Dean <robert@deansurveying.com>

This attachment is my revised letter.

Sent from my iPhone

Begin forwarded message:

From: "Robert Dean" <robert@deansurveying.com>
Date: January 3, 2011 6:44:34 PM PST
To: leavitt@cityofvancouver.us
Cc: "Rorabaugh, Thayer" <thayer.rorabaugh@cityofvancouver.us>,"Holmes, Eric" <eric.holmes@cityofvancouver.us>, jeanne.harris@cityofvancouver.us,wagnerd@columbiarivercrossing.com
Subject: meeting with Don Wagner
Reply-To: robert@deansurveying.com

January 3, 2011

Today I met with Don Wagner at his office between 1:30 and 2:30. Jeanne Harris arranged the meeting and was there briefly to introduce us. She had to leave for another appointment and so she asked Thayer Rorabaugh to stand in for her. Thank you Jeanne!

Don Wagner led off with assurances that he had read my previous letter on traffic staging and they were addressing my concerns. Thayer, also, had been forwarded from Tim Leavitt a similar letter which he had read. Thayer gave examples from past projects of how they work with local businesses and do their best for them. I expressed thanks to Tim Leavitt and the City for asking the

1

P-012-001

This letter from Mr. Dean is his account of a meeting he had in January 2011 with Don Wagner, the former CRC Project Director from WSDOT, and Thayer Rorabaugh from the City of Vancouver. He also attached the list of questions and concerns that he had sent to Mr. Wagner in advance of their meeting. Mr. Dean's account appears to indicate that he was able to ask the questions he wished to ask, and received answers from Mr. Wagner and Mr. Rorabaugh. The responses below do not remark on Mr. Dean's account of that meeting.

For information on construction impacts and mitigation, Mr. Dean is referred to each sub-section of Chapter 3, which discusses temporary impacts and mitigation measures for each element of the environment. Additional discussion is provided in the technical reports that support the FEIS.

The responses below address the list of questions that Mr. Dean prepared in 2010, and resubmitted with his comment letter on the FEIS in October 2011, to the extent that they are relevant to the NEPA review.

P-012-001

right questions and for Resolution M3663. Don and Thayer said they are going through the list of caveats in the LPA to make sure they are addressing them.

I acknowledged their success with previous projects (Salmon Creek and Delta Park) and asked if they would do specific studies on this one to protect small businesses; especially since this project will last up to nine years. I mentioned legal (Executive Orders) and moral imperatives to look out for small businesses. I explained the 5 year refinancing problem building owners face and used my building in Hazel Dell as an example.

I gave Don the newspaper article on the WSU study of economic impacts of reconstruction of the locks and also Ken Casavant's bio and contact info. He seemed interested in pursuing my request.

I mentioned that the DEIS attributes an estimated $8 million annual savings to the trucking industry in 2030 with build out of the new bridge. Is that enough savings to justify $4 billion expenditure? Don responded that that was only for one aspect of benefits. I suggested that commuters would have no net benefit because we will be paying for it with tolls. Don said we would only be paying a third (let's see, $1.5 billion capital plus interest plus collection costs plus cost overruns =?).

I asked if there was a cost/benefit analysis for the project. No. Was he aware that Steve Stuart had asked for one for tolls? Yes. It has not been done yet because they do not have a final design (he implied that they might be going with the Kevin Peterson design).

We talked about the need for an SEIS and the political inertia involved. They both are aware of sunk costs and the benefits of spending money during design phase rather than as cost overruns later. Don Wagner said, "Tell it to the Columbian editorial board."

I had mentioned the need for an SEIS to Tom Warne earlier. He was very circumspect. I got the impression at this meeting that it is being discussed. Don Wagner said he is meeting this afternoon with the feds to find out who is the lead agency on the project. I suspect Tom Warne wants to know if an SEIS will be called for if they switch to the Kevin Peterson design.

Don mentioned that there are hundreds of ways for the project to fail. Most prominent causes are funding and political will. He mentioned voting (on light rail) and the last elections (alluding to the election of Jaime Herrera I think). He seemed melancholy to me and resigning himself to imminent failure of funding. He exchanged glances with Thayer as if they had just been talking about it before I came.

I said I did not know of anyone who wanted to see the project fail. Don disputed that. I said I am on the email lists and some want to see light rail fail and some want to see tolls fail but we all want a better crossing that we can afford and that does what it's supposed to do.

Don said several times things like "If this gets built" and "If they build this design" as if he has doubts that anything will be built and if anything it will be Kevin Peterson's design. He said the IRP Expert Panel will be reporting January 19.

We talked about the original scoping and that there was no justification in the record for rejecting the Bi-State Industrial Corridor. I suggested the need for a Supplemental Environmental Impact Statement going all the way back to scoping and goal setting. The number 1 goal should have been to relieve the choke points to commerce on the West Coast of the US and allow future growth. If the Bi-State Industrial Corridor failed question 6 in Step A Screening Report then did they ask the right questions?

Don mentioned that a westerly arterial, west of the lake, to Ridgefield was rejected about 20 years ago. I suggested that was a lot of freeway to build through a wilderness.

We talked about preserving the historic bridges. Don said they are spending tens of millions to mitigate for the loss of 1.5 acres of the Historic Preserve. The bridges themselves are doomed.

P-012-001

They are seen as a safety hazard by WSDOT (legal justification for destroying them) and the bridge lifts are a nuisance to Downtown commerce.

We talked about retro-fitting the Interstate Bridges for seismic safety. Don said the $300 million cost was for the first stage only – piers.

Don and Thayer both dispute that the RR bridge can be raised. They say for 90' clearance above the water and at 2% grade the RR would land too far North to make the Vancouver yards. My preliminary calculations from the GIS say it would land under the Mill Plain Overpass.

I suggested they redo the RR bridge and build the Bi-State Industrial corridor with light rail, bike paths, etc. and have it paid for by the RR, Coast Guard and Ports rather than on the backs of Vancouver commuters. They scoffed that the RR, Coast Guard or Ports would pay for anything.

Thayer said most of the Port traffic goes East and there is little truck traffic between ports. I did not have a chance to dispute that as we moved on to other things.

P-012-002

Don said the rumor that they hope to toll both crossings (I-5 and I-205) is not true. He wishes it would go away. He did say they might consider pre-construction tolling as they are doing in Seattle. I suggested that was a good idea and that they should test their financial and traffic projections immediately before committing the $4 billion. I asked if any law changes were required for tolls. He said no federal changes for I-5 (not so for I-205) and some changes for Oregon and Washington.

I gave Jeanne Harris and Don Wagner signed hardcopies of the attached donwagnerletter.PDF

Robert Dean, President
Dean Surveying, Inc.
717 NE 61st St., #100
Vancouver, WA 98665
(360) 892 2600
fax (360) 256 1156

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

P-012-002

The project will continue to assess pre-construction tolling.

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January 3, 2011

CRC Project Vulnerabilities

Potential Adverse Impacts on Downtown Vancouver Commerce

P-012-003 This paper is an expression of concern for the wellbeing of designers, workers, businesses, commuters, and citizens of the communities who will be affected by construction of the Columbia River Crossing Project.



P-012-003

Thank you for your comments.



DEAN SURVEYING, inc.
717 NE 61st St., Suite 100
VANCOUVER, WA 98665
(360) 892 2600

January 3, 2011

Don Wagner
700 Washington Street, Suite 300
Vancouver, WA 98660

Re: Project Vulnerabilities

Mr. Wagner,

P-012-004 This project faces significant, potentially fatal, obstacles; each of which requires further study, as follows:

1) Funding. Each leg of the stool is in serious jeopardy.
2) Public opposition. There is no cost/benefit analysis and no consensus of public support.
3) Public input. The more people learn about this project the more opposition arises. The only way to gage public support is through an informed vote. The City of Vancouver asked for truck detours during construction and studies of construction impacts. Steve Stuart asked for a cost/benefit analysis on tolls – has that been done? Tim Leavitt and Sam Adams asked for an analysis of our community's ability to pay for the project – has that been done? The IRP called for an investment grade study of tolls - has that been done? The Plaid Pantry report disputed the economic analyses of the DEIS – have those claims been explored?
4) Political change. We have a new congresswoman, the US Senate no longer supports earmarks, and more local Republicans have been elected to the Washington State Legislature.
5) Weakened support from the media. The Columbian endorsed the opponents of Jim Moeller and Patty Murray in the last elections.
6) Economic decline. The project was conceived and planned for during the height of economic optimism in the early and mid-decade 2003-2007.
7) Economic stress. The DEIS identifies many local funding sources, besides tolls, that are now no longer available as local agencies scrap to shore up their own budgets.
8) Scoping. The initial scoping omitted viable alternative routes that had previously been studied and that may have alleviated many of the obstacles now facing the project. Each of the obstacles now coming to light could have been avoided with careful and comprehensive scoping and goal setting in the initial design stages.
9) Benefits not there. Traffic projections have not borne out.
10) Construction impacts on commerce. Temporary impacts, especially on small businesses, due to construction have not been studied. The DEIS projects as much as 9 years of construction. That will affect two refinancing cycles of most affected businesses. The DEIS promises more studies– have these been done?
11) Systemwide traffic impacts due to construction. Is it possible to work on I-5 without plugging I-205? Have all the stakeholders been consulted? Where is the justification for rejecting the Bi-State Industrial Corridor #4?
12) Historic preservation. The DEIS promises further studies – have these been done? Can anything be done to save the historic, iconic bridges or should that have been part of original scoping?

P-012-005 P-012-006 P-012-007 P-012-008 P-012-009 P-012-010

Respectfully,

Robert Dean, President

P-012-004

Please refer to Chapter 4 of the FEIS for a description of the current plans for funding construction and operation of the LPA. This discussion provides an updated assessment of likely funding sources for this project, though it is not common practice to receive funding commitments prior to completion of the alternative selection process. As described in the FEIS, project funding is expected to come from a variety of local, state, and federal sources, with federal funding and tolls providing substantial revenue for the construction.

P-012-005

There are no plans to hold an election on the project as a whole but the C-TRAN operating funds will be subject to a public vote.

P-012-006

The project has completed a benefit cost analysis. It can be reviewed at, or a copy obtained from, the project office. In addition, the project has completed Cost Estimate Validation Process (CEVP) studies and will, following the ROD, complete an investment-grade tolling analysis.

P-012-007

Many alternatives were considered during the CRC alternatives evaluation process, including alternatives that had been previously studied. See the discussion in Chapter 2 of the FEIS. It is unclear from this comment what obstacles Mr. Dean is referring to.

P-012-008

There is no question among the local, state, and federal sponsoring agencies that the project relieves congestion, improves travel time, increases transit ridership, and will reduce crashes.

QUESTIONNAIRE

Cost Overruns

P-012-011

Who pays cost overruns?

Have there been cost overruns on recent projects?

By WSDOT?

By ODOT?

By DEA?

By PB?

By CH2M Hill?

By Parametrix?

What is the likelihood of cost overruns on this project?

Has the design phase experienced cost overruns?

Do you see that as good or bad?

P-012-012

Have you done studies to show that the community can afford this project as Tim Leavitt asked in March 2010?

Have you studied the Plaid Pantry report? Do you have a formal rebuttal?

The Columbian reported that the CRC did not dispute the numbers in the Plaid Pantry report. Do you stand by that assessment?

The Plaid Pantry report is at odds with your studies on tolls. Will you consider testing the studies by imposing tolls in advance, as suggested by Steve Stuart in March 2010, before spending $4 billion?

Sam Adams and the Plaid Pantry report both express concerns that the third leg of the stool, $1.5 billion in local funding, will compete with or cannibalize other local projects. How can it do otherwise?

What would it take to cause this project to fail?

What will be the effect on Vancouver if this project fails economically?

What would be a worst case scenario?

P-012-009

Additional analysis of construction-related impacts to businesses was conducted for the FEIS.

It is possible to stage traffic on I-5 during CRC construction so as to avoid significantly impacting I-205. All stakeholders have been given opportunities to consult.

Chapter 2 of the FEIS discusses the rationale for not advancing the Bi-State Industrial Corridor idea into the DEIS.

P-012-010

As indicated in Chapter 3 (Section 3.8) of the DEIS, the 1917 (northbound) I-5 bridge structure is listed on the NRHP. The 1958 (southbound) bridge, as a bridge on the National Interstate System, was determined not to be significant at a national level and is not considered eligible for the NRHP. However, the two bridges together are an important element of the historic fabric both for the region and for downtown Vancouver.

Because the 1917 bridge is listed on the NRHP, it is afforded special protection under Section 4(f) of the Department of Transportation Act. This law prohibits the USDOT from funding any project that would have an adverse impact on significant historic resources, unless it can be demonstrated that there are no prudent and feasible alternatives that would avoid that impact.

The Supplemental River Crossing, which maintained the existing bridges with seismic retrofits and was analyzed as a component of two of the five alternatives studied, was determined feasible, but not prudent. It would not satisfactorily meet the project Purpose and Need. In addition, the alterations necessary to make the existing bridges safe, reliable, and fully multimodal, as described in Chapter 2 of the DEIS and FEIS, would

P-012-012

How are you following Executive Order E 1038.00 WSDOT and Risk Management Planning guidelines? Do you have an economic cost/benefit analysis?

What risks have been taken into account? Number of parcels? Impacts on access? Litigation costs and delays? Change of grade? Temporary construction permits? Existing conditions assessment?

What effect will failure of the project have on your career?

How accountable is each member of your team for success or failure of the project?

As an engineer are you required to alert your employer if and when you see that the project will fail?

Are you confident that every member of your team is free to alert you to possible points of failure?

What measures have you taken to facilitate sensitivity to and awareness of weaknesses in the process?

What is an example of a possible fatal flaw?

Have you published a simple cost/benefit analysis table for the local funding portion as Steve Stuart asked in March 2010?

P-012-013

The DEIS estimates the annual savings for the trucking industry in 2030 for build over no-build to be $8 million. Is there a similar quantifiable benefit for commuters?

Will trucks pay the same toll as commuters?

Will tolls vary by length of vehicle, weight, number of occupants, speed, value, carbon footprint?

The DEIS estimates the net capital amount to be raised by tolls to be $1.5 billion. Do you have an estimate for the total gross amount to be extracted from toll-payers?

undermine the historic integrity of the bridges. The Sponsoring Agencies therefore decided to remove and replace the existing bridges.

Proposed mitigations for the adverse effects of the NRHP-listed I-5 bridge can be found in Chapter 3 (Section 3.8) of the FEIS.

P-012-011

Past financial performance is an important issue but is not relevant to the NEPA review process. The Record of Decision concludes the NEPA analysis. It indicates which alternative has been selected by the federal government, and allows for the continued design, eligibility for federal funding and permitting, and eventual construction of that alternative. The Locally Preferred Alternative is supported by local, regional, state, and federal agencies and has been selected following an exhaustive analysis and public involvement program.

The project takes the issues of financial management very seriously. Project staff have provided Mr. Dean with considerable records and reports and has responded to his inquiries. The project is currently developing new financial reporting mechanisms and has started providing monthly reports on the web. The project will continue to work with the public to improve transparency and an understanding of the resources required for an undertaking of this scale.

P-012-012

Highway tolls would pay for the local share of the project costs. A range of toll rates was analyzed. A toll of $2 each direction is assumed in the ridership analysis in the EIS. That analysis indicates that such a toll would be enough to discourage some trips from being taken. We don't know if those trips wouldn't be taken due to affordability or due to preference reasons. See the discussion in Section 3.1 of the FEIS.

Regarding the Plaid Pantry report, please see responses to P-047 from

Traffic Staging

P-012-014

How long will portions of I-5 be under construction with this project?

What part did traffic staging play in scoping, goal formulation, and the selection of alternatives?

What part did traffic staging play in the selection of the final locally preferred alternative?

Is it possible that the traffic staging problem could present a fatal flaw to the success of the project?

How have you taken the City of Vancouver Resolution M3663 to heart?

What provisions have you made to detour trucks around the construction zone?

Is it possible that traffic staging problems may prompt you to revisit some alternatives that were previously rejected?

How long will construction last? How many 5-year refinancing cycles will businesses have to go through as they try to justify their revenue losses to the banks?

Will you compensate affected businesses for loss of revenue due to construction?

Have you initiated studies of the likely economic impacts of construction (temporary effects)?

How will you mitigate those impacts?

How many local businesses will be seriously adversely affected by the impacts of construction even after mitigation?

Of those businesses, how many are qualifying small businesses?

How many are minority owned?

Joe Cortright and P-061 from David Madore. Many of the numbers in that report are disputed.

Pre-construction tolls may be implemented.

The local funding share would be raised through tolling the I-5 crossing. Tolls paid to cross the bridge could not be used on other projects in the region. This toll would not preclude other projects in the future from also raising revenues through tolling or other means.

An economic benefit cost analysis of the proposed project found it to be economically worthwhile.

The project has been identifying risks, and estimating the cost and schedule ramifications, through the Cost Estimation Validation Process (CEVP). The results are available from the project office.

P-012-013

Answers to some of your questions can be found in Chapter 4 of the FEIS. For example, the FEIS assumes that freight haulers (large trucks) will pay four times the toll of an automobile commuter. Other answers will only be found once the project has an investment-grade tolling analysis. You will not likely find a detailed estimate of the financial benefit to auto commuters. Because some trips are recreational, individuals differently value their time, and because of the variability of other factors, such an analysis has not been completed.

P-012-014

The FEIS describes current estimates of the duration of construction.

Constructability, including traffic staging, was considered in evaluating and refining alternatives. Traffic staging is a challenge but not a fatal flaw for the Selected Alternative.

P-012-014

How many are woman owned?

How many are disadvantaged?

How many are new or emerging?

Has the Small Business Administration been asked to provide input to any of your studies?

How are you complying with Executive Order 11518?

Where do you publish the studies?

Have your traffic engineers studied the effects of construction on I-5 for the period of construction on the region-wide transportation network? Will I-205 plug up for ten years?

Have your economists studied the economic impacts of construction on I-5 for the period of construction on the economy within the region-wide transportation network area? Will land values drop in Ridgefield?

Do you have a plan to coordinate construction on the CRC project with all other agencies so that access to Downtown Vancouver will not be further hampered?

Construction impacts have been considered as part of the alternative evaluation, project planning, and mitigation development. These will continue to be developed and refined during final design. Detours and reroutes will be determined during final design and construction planning.

Businesses will not be compensated for loss of business. See Section 3.4 of the FEIS discussion regarding measures to reduce such impacts on businesses during construction.

The project team surveyed businesses that would be directly displaced by the project to learn more about the demographics of owners, employees, and customers, but has not done such a detailed survey of the businesses that would not be directly affected. The project team has met with many of these business owners as well, and has afforded opportunities for all business owners to provide input on and learn about the project. The SBA has not been directly requested to provide information on the project's studies. Studies are made available on the project website or from the project office. The DEIS, FEIS, and technical reports were also made available in local libraries. The project has been consistent with the intent of Executive Order 11518.

The impacts of construction activities on regional traffic patterns is not expected to be significant, and significant diversion is unlikely given the conceptual traffic staging plans. Therefore, there is no need to conduct an analysis of temporary effects on property values in Ridgefield.

The project is committed to coordinating construction with all other agencies so as to minimize access, congestion, and other impacts. Detailed plans will be developed during final design and construction planning.

Historic Bridges

P-012-015 In what ways have you followed the spirit and letter of the National Historic Preservation Act of 1966?

What part did preservation of the historic bridges play in scoping, goal formulation, and the selection of alternatives?

What will happen to the bridges?

How did these decisions come about?

Will it take changes in laws to allow the bridges to be moved or destroyed?

Will there be a public debate?

What mitigation for impacts have been considered and identified for the historic bridges, the Academy property, and Vancouver National Historic Reserve?

Permits

P-012-016 The DEIS asserts that no permits will be required that might affect selection of the preferred alternative. Did you consider the number of privately owned parcels affected by right of way acquisition as being significant? Permits will be required of adjoining property owners for grade change, access restrictions, temporary construction, slopes, staging and stockpiling, acquisitions, etc.

P-012-015

Please see the response to comment P-012-010, above.

P-012-016

Individual property acquisition costs will be established through an independent appraisal process to ensure the owner receives the fair market value of the property. This process is governed by the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act). To date, the project has not conducted specific property valuations, which is necessary to determine the individual property acquisition cost. For the Draft EIS, the project team made general assumptions about the cost of acquiring property, based on a rough estimate of square footage, land use, possible demolition costs, etc. to compare the costs of alternatives in the Draft EIS, and made similar assumptions to inform the financial planning in the Final EIS. These estimates do not reflect what property owners will actually receive as compensation, and therefore were not distributed for review.

APPENDIX

Supplemental Environmental Impact Statement

P-012-017

40CFR1501.2 mandates that NEPA is to be applied early (first thing) in the planning process. Even before the DEIS and selection of alternatives, risks, obstacles, and possible adverse environmental impacts must be anticipated, identified, and accounted for during scoping.

40CFR1501.7(c) provides that *"An agency shall revise the determinations made under paragraphs (a) and (b) of this section if substantial changes are made later in the proposed action, or if significant new circumstances or information arise which bear on the proposal or its impacts."*

40CFR1502.9(c)1(ii) also provides for a Supplemental Environmental Impact Statement if *"There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts."*

P-012-017

Following is a brief summary of CRC's compliance with the cited sections of the code of federal regulations (CFR).

40 CFR 1501.2 and 1501.7(c): A notice of intent to prepare an EIS for the CRC project was issued in September 2005. That preceded discussions with the public on transportation needs in the project area and other concerns, followed by the development of a problem statement and the project purpose and need, as well as evaluation criteria. The process then moved into soliciting ideas, conducting screening, and other steps leading to a range of alternatives that was advanced into the DEIS. The DEIS was published in May 2008, and the selection of the LPA was made in July 2008. Subsequent coordination, analysis, and refinements led up to the FEIS in September 2011. Information that arose throughout this process was incorporated into the analysis and led to refinements to the proposed project. This is discussed in Chapter 2 and Chapter 6 of the FEIS.

40 CFR 1502.9(c): Please see the response to letter P-047-013.

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October 18, 2010
Citizen Communications

How long can we hold out during construction?

P-012-018

I have been admonished for using highly emotive words to describe the CRC Project and its potential to harm Vancouver; words like: Ruin, bankrupt and monstrosity. I am asked "can't you see any good things coming to us from the CRC Project?" Well, yes, there is just as much potential for good as for harm and it may be a wash. But, the truth is, no one knows one way or the other. The Independent Review Panel pointed out very serious deficiencies and uncertainties in the project, as follows:

1) They don't know how much it will cost.
2) They don't know how long it will take to build
3) They don't know if there will likely be cost overruns or how large
4) They don't even know if the current design can be built on this site

Other than that, the Mayor is pretty sure it will bring "jobs, prosperity and a better quality of life to Vancouver." No one doubts his optimism.

One thing is certain, no benefits will accrue to Vancouver until after the bridge and all of the approaches are fully built. Perhaps, instead of asking the CRC how long will it take to build out the project, we should ask ourselves, "How long can we hold out during construction?"

"How long can Vancouver survive with I-5 all torn up?" What alternative routes will be available for people to get into Downtown if they are coming from, say Battle Ground, or Camas, or Ridgefield?" "Will students who live in Portland be able to get to classes at Clark College or WSU?" "Can the Amphitheatre survive even one summer with I-5 under construction?" "How many businesses will have to close before we throw in the towel?" "Will all those track hoes, orange cones, flaggers, jersey barriers, lane closures, muddy and irregular pavements, detours, and seemingly weekly reports of fatalities, deter some people from even attempting the trip into Vancouver?" "Can we ask Clark County, WSDOT, Burlington Northern, the Port of Vancouver, and even the City of Vancouver to postpone, for perhaps ten years, any other capital improvement construction projects along the alternative routes that might further hinder access to Downtown?"

How long can we hold out during construction? How long can we survive isolated? I do not know. If you know the answer to that question, please tell us. If you do not know, please find out. Please ask your financial staff to come up with a credible estimate. That way, when the CRC finally tells you how long the construction will last and how they plan to phase it, you will be able to respond – "fine, that will work for us," or "sorry, CRC, that is not good enough, we will all be dead by then."

Respectfully,

Robert Dean, President

P-012-018

Chapter 2 of the FEIS discusses how the project considered and responded to recommendations from the Independent Review Panel, and the Bridge Expert Review Panel.

There will be adverse impacts during construction, as described in Chapter 3 of the FEIS. Mitigation measures to reduce those impacts are also discussed in the FEIS. I-5 will not be closed. There could be short-term partial lane closures at times and some interstate access points would be unusable for many months during construction, but alternate access points will be available, as described in the FEIS.

Hines, Maurice

From: Robert Dean [robert@deansurveying.com]
Sent: Sunday, October 16, 2011 9:17 PM
To: Columbia River Crossing
Subject: CRC FEIS failed to address traffic staging
Attachments: trafficstagingsystemimpacts.pdf; ATT13307301.htm

The FEIS failed to address traffic staging during construction.

P-013-001 I sent this to Don Wagner and Thayer Rorabaugh earlier this year. I met with them both (at the Invitation of The Mayor and Jeanne Harris) in January to discuss construction impacts. I gave them the name and contact info for the WSU prof who conducted an economic study of the effects of closing the locks on the Columbia for 3 months. The DEIS told of likely "severe" disruption to commerce during 8 years of construction of the CRC. Does their $130 million in studies include the effects on people? No! Does the FEIS cover construction impacts? Briefly, they will warn us on which roads will be closed - like yelling incoming!

There is nothing in the FEIS about the effects of construction on I-205, SR-14, SR 500, surface streets, the airport, etc. They do not address how businesses on Main Street can survive while Washington and Broadway are torn up. They do not have any independent economic studies - not even educated guesses. Not even uneducated guesses. Certainly not the same detailed knowledge as they on the effects of construction on fish.

Sent from my iPhone

Begin forwarded message:

> **From:** "Robert Dean" <robert@deansurveying.com>
> **Date:** December 11, 2010 4:35:38 PM PST
> **To:** wagnerd@columbiarivercrossing.com
> **Cc:** Jeanne.Harris@cityofvancouver.us
> **Subject: CRC traffic staging system-wide impacts**
> **Reply-To:** robert@deansurveying.com
>
> Don,
>
> Thank you for agreeing to meet with Jeanne and me this coming Jan 3. I do appreciate your time and understand that you could not meet this past week.
>
> To help you prepare for our meeting I have modified the letter I wrote to Tom Warne and addressed it to you directly. I would like your take on the letter before I forward it to the parties Tom suggested (see below).
>
> Thank you for your work. You are blessed.
>
> Have a very merry Christmas with your family.
>
> Robert Dean, President
> Dean Surveying, Inc.
> 717 NE 61st St., #100

P-013-001

There was no quantitative study of how traffic affected by construction activities would in turn indirectly affect business profit and loss. However, construction impacts for each element of the environment are discussed at least qualitatively, and in some cases quantitatively, in each sub-section (e.g., 3.1 Traffic, 3.2 Aviation and Navigation, etc.) of Chapter 3 under the sub-heading "Temporary Effects". Mitigation for temporary effects is also discussed. There is a discussion about the approach to reducing the impacts to businesses during the construction of the light rail alignment on Washington and Broadway in Section 3.4.5. Impacts are further detailed in the technical reports that the FEIS is based on.

Vancouver, WA 98665
(360) 892 2600
fax (360) 256 1156

----- Original Message -----
From: "Harris, Jeanne" <jeanne.harris@cityofvancouver.us>
Sent: Wed, December 8, 2010 10:10
Subject: RE: CRC traffic staging

P-013-001

I've got January 3 at 1:30 scheduled with Don and you and me at CRC. Does that work for you?

Jeanne

From: Robert Dean [robert@deansurveying.com]
Sent: Friday, December 03, 2010 9:42 AM
To: Harris, Jeanne
Subject: Fw: CRC traffic staging

fyi

----- Original Message -----
From: "Robert Dean" <robert@deansurveying.com>
Sent: Fri, December 3, 2010 9:37
Subject: CRC traffic staging

Excellent!

I'm sure Mr. Wagner will value your guidance and advice.

As for timing - nothing should proceed to construction until the study is done.

Robert

----- Original Message -----
From: "Casavant, Ken" <casavantk@cahnrs.wsu.edu>
Sent: Fri, December 3, 2010 9:21
Subject: RE: RE: CRC traffic staging

I don't know if we have the expertise to do the study since I am not sure of the scope, timing and implementation, but you can pass along our name as someone that is interested and could help in any such study. Ken

---

From: Robert Dean [mailto:robert@deansurveying.com]
Sent: Friday, December 03, 2010 9:01 AM

To: Casavant, Kenneth
Subject: Fw: RE: CRC traffic staging

P-013-001

Ken,
The AP article was published in The Columbian this morning.

The draft environmental impact statement of the Columbia River Crossing made no mention of the economic impact on surrounding communities of the construction itself. I pointed that out to the Mayor of Vancouver, Tim Leavitt, and he asked me to write the attached letter to the Independent Review Expert Bridge Panel, Tom Warne, Chair. The IRP was appointed directly by the governors at the request of the mayors and county commissioners.

Council Member, Jeanne Harris, arranged a meeting with Don Wagner, Director of CRC. I intent to ask him to convene an economic study of those impacts. Is it OK to suggest that WSU is equipped to conduct that study. May I pass on your name?

Best regards!

Robert Dean, President
Dean Surveying, Inc.
717 NE 61st St., #100
Vancouver, WA 98665
(360) 892 2600
fax (360) 256 1156

----- Original Message -----
From: "Tom Warne" <twarne@tomwarne.com>
Sent: Mon, November 29, 2010 8:04
Subject: RE: CRC traffic staging

Robert-I would suggest that you send this to the CRC since they are managing the project and the BRP is only a part of that process. You may want to send a copy to Director Garratt at ODOT and also Secretary Hammond at WSDOT.

My only caution comes from working on many very large projects where traffic management is an issue and needs to be addressed. There are many solutions and the optimal one will come from substantial modeling. Modeling will show where the cars will go, how best to invest in temporary measures and what the best combination of strategies is. Those signing the letter probably aren't familiar with the detail that goes into the process and may be actually signing on to something that is not the optimal solution. Perhaps you could frame it as "one option" that should be considered and that the project needs to find the optimal solution that will allow the public to travel

P-013-001

effectively in the region during construction. Just a thought. You are obviously welcomed to do whatever you want.

Thanks,

Tom

Thomas R. Warne, PE

Tom Warne and Associates

9874 S. Spruce Grove Way

S. Jordan, UT 84095

801-302-8300

801-302-8301 fax

From: Robert Dean [mailto:robert@deansurveying.com]
Sent: Saturday, November 27, 2010 12:54 PM
To: Tom Warne; jshowers@ch2m.com
Cc: steve_stroh@urscorp.com; jvachon@pubknow.com
Subject: RE: CRC traffic staging

Thank you, Tom!

I have sent the letter about traffic staging out to several friends and elected officials. It usually strikes a chord with them. Can you suggest who should receive the letter? Should it go to the CRC?

I will send out for endorsements as follows:

The undersigned recognize a need to expand the capacity of the interstate crossing system in Clark County, Washington, before temporarily restricting its capacity during construction of the Columbia River Crossing Project.

Best regards,

Robert Dean, President
Dean Surveying, Inc.
717 NE 61st St., #100
Vancouver, WA 98665
(360) 892 2600
fax (360) 256 1156

----- Original Message -----
From: "Tom Warne" <twarne@tomwarne.com>
Sent: Sat, November 27, 2010 5:05
Subject: RE: CRC traffic staging

P-013-001

Robert-thanks for sending this along. We will distribute it to the members of the BRP. Managing traffic during construction of large urban projects is a challenge all by itself-besides the actual construction. Many have done it well and you cite several examples. While the specifics of the traffic management strategies that the CRC eventually employs are outside of the prevue of the panel we are definitely looking at it from a holistic standpoint as manl aging traffic during construction and the bridge itself cannot be separated.

Thanks again for your continued input and insights.

Tom

Thomas R. Warne, PE

Tom Warne and Associates

9874 S. Spruce Grove Way

S. Jordan, UT 84095

801-302-8300

801-302-8301 fax

From: Robert Dean [mailto:robert@deansurveying.com]
Sent: Wednesday, November 24, 2010 12:16 AM
To: jshowers@ch2m.com
Cc: Tom Warne; steve_stroh@urscorp.com
Subject: CRl C traffic staging

Joe,

I have taken a shot at addressing the traffic staging problem. Please pass this attachment on to the other panel members and see if the concerns I raise have been looked at adequately.

5

Thank you!

Robert Dean, President
Dean Surveying, Inc.
717 NE 61st St., #100
Vancouver, WA 98665
(360) 892 2600
fax (360) 256 1156

----- Original Message -----
From: "Robert Dean" <robert@deansurveying.com>
Sent: Wed, November 3, 2010 15:12
Subject: CRC context sensitive

Joe,

P-013-001

Thank you for your question to Kevin Peterson about traffic staging. That question has been! plaguing me about the CRC Project, also. I cannot see how you can stage traffic around the torn up I-5 for perhaps 7 years and not bankrupt Downtown Vancouver and Jansen Beach. That's why I suggested the question is not, "How long will it take to build the project?" but "How long can we survive while it is being built?"

That is what struck me about Kevin's proposal - it was context sensitive.

If the Independent Review Panel had picked up on the context sensitive mandate of bridge design they would have worded their criticisms differently. For example:

1) Not, "How much will it co! st?" but "How much can we afford?"

2) Not, "What likelihood of cost overruns?" but "Can the local community afford to pay tolls?"

3) Not, "How will it be funded?" but "Will the taxpayers approve?"

4) Not, "Did we take public input?" but "When should we hold the vote?"

5) Not, "How large is the footprint?" but "How many property owners will be affected?"

P-013-001

Kevin's proposal looked more sensible to me than the CRC model. The only drawback for me is the traffic staging problem, or more accurately, the effect of construction on the local communities.

My preference would be to build a third bridge downstream to act as a detour while they retro-fit the iconic, historic, Interstate Bridge for seismic safety.

Best!

Robert Dean, President
Dean Surveying, Inc.
717 NE 61st St., #100
Vancouver, WA 98665
(360) 892 2600
fax (360) 256 1156

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

DEAN SURVEYING, Inc.
717 NE 61st St., Suite 100
VANCOUVER, WA 98665
(360) 892 2600

December 11, 2010
CRC Traffic Staging Problem

Potential Adverse Impacts on Downtown Vancouver Commerce



DEAN SURVEYING, Inc.
717 NE 61st St., Suite 100
VANCOUVER, WA 98665
(360) 892 2600

December 11, 2010

Don Wagner
700 Washington Street, Suite 300
Vancouver, WA 98660

Re: Traffic Staging for Downtown Vancouver

Mr. Wagner,

P-013-002

Thank you for the opportunity to express concerns about some of the potential negative impacts of the Columbia River Crossing Project. The CRC is by far the most significant public works capital improvement project for our region since construction of PDX. We all anticipate the tremendous economic benefits promised for considerable expenditures of public funds.



-Boston Big Dig-

However, no benefits will accrue until construction is completed. Hence, our more immediate concern must be for the impacts of those construction activities on our communities.

The City of Vancouver, when it adopted the Locally Preferred Alternative, stipulated the need to

P-013-002

Please see the response to your comments above and your other letters (P-012, P-014, and P-015). See also the discussion of alternatives, including other river crossing locations considered, in Chapter 2 of the FEIS (particularly Section 2.7).

P-013-002

mitigate for disruption to commerce during construction of the CRC project.[1] The City recognized that a project of this size and complexity will require several years of construction activity which could impose severe hardships on businesses and the community.

Where engineers ask, "How long will it take to build the bridge?" we ask, "How long can we survive during construction?" How long can Downtown Vancouver hold out while 5 miles of I-5 freeway is torn up? Will the Hilton Hotel survive financially? Will emergency vehicles have ready access in the construction zone? Context sensitive design demands answers to these questions.



Context

Without the Interstate Bridge, Vancouver would be a quaint village beside the river. The Central Business District grew and flourished because of Highway 99, I-5, and the bridge. Now, we have outgrown the historic Interstate Bridge and we notice its limitations more than ever. Any closure or impediment due to lifts, traffic accidents, maintenance, police action, Secret Service inspections, or congestion is acutely felt and hugely expensive. So far, we have not had to suffer prolonged closures or restrictions such as may be anticipated with construction of the CRC Project.

I-5 is the carotid artery of Vancouver. It runs along the eastern edge of the Central Business District. There is no other road access to the CBD except from or across I-5. There is no road bridge across the Columbia River to the west of Vancouver.

To the west of the CBD the Port of Vancouver and Fruit Valley Industrial Area depend on access to I-5 for trucks, deliveries, suppliers, employees, etc. If 70% of their traffic goes south they must impose on Mill Plain and Fourth Plain, both already at capacity, to access I-5 on the other side of town. The Industrial West already has pressing needs for alternative access routes[2].

Vancouver is served by only two road bridges – on I-5 and I-205. Both bridges are currently at capacity during peak hours. That means that if either bridge is closed or impeded the other cannot make up the deficiency.

---

1 Resolution M-3663 page 2 of Attachment A adopted July 7, 2008.

2 See July 22, 2010 letter from Clark County Board of Commissioners to RTC attached in Appendix

P-013-002

I-205 provides a bypass around Portland for through traffic on I-5. However, the Glen Jackson Bridge has more far reaching significance for Vancouver. It provides alternative access to Downtown Portland by way of I-84 and it connects all of Vancouver and Clark County directly to PDX. East Vancouver, Camas, Washougal, Battle Ground, Ridgefield and the region have grown because of the Glen Jackson Bridge. If diversions from I-5 during CRC construction impinge on I-205 the negative economic impacts will be felt region-wide.

System-wide Considerations

In April 2003, ODOT commissioned an economic study of the transportation network in our region. That study identified critical choke points crossing the Columbia River. It recognized an immediate capacity for two additional highway crossings.

In April 2008, the RTC Transportation Corridor Visioning Study piggy backed on the earlier DEA/ODOT study and identified an additional four possible crossing points with useful arterials throughout Clark County.

In May 2008, the CRC issued its Draft Environmental Impact Statement. The DEIS did not build on the two previous studies. Chapter 2 did not mention alternative crossing points as options. Chapter 3 did not mention possible negative economic impacts on commerce of construction itself. The DEIS failed to recognize a need to expand the capacity of the interstate crossing system in Clark County before temporarily restricting its capacity during construction.

Independent Studies

Each study should trigger a go/no-go decision at CRC. To maintain credibility, in case of a "go" decision, the CRC should commission its studies from sources with no, or minimal, interest in the outcome. Washington State University is currently studying the economic impacts of 3 months of lock construction along the Columbia River.[3] To date, no similar studies have been conducted on the economic impacts of 5 years of construction along I-5 through Downtown Vancouver. No construction should proceed until independent studies are completed and evaluated.

Detour Needed

As a condition of endorsement of the Locally Preferred Alternative, the City of Vancouver mandated that the CRC final design must satisfactorily address construction mitigation identified in Attachment A of its Resolution M-3663[4]. The City asked the CRC to consider pre-constructing alternative dedicated truck routes as an example of how their concerns might be addressed.

---

3 http://www.columbian.com/news/2010/dec/02/wsu-to-study-closure-of-rivers-locks/

4 Resolution M-3663 page 7.



P-013-002

Each of your design consultants has experience designing traffic staging plans for such projects as Tacoma Narrows Bridge, Boston Big Dig, Denver Airport, I-25 in Denver, I-15 in Salt Lake City, and the Sunset Highway in Portland during construction of light rail. You know that to avoid back-ups it is not enough to allow traffic to wind its way through a construction zone. The only satisfactory traffic staging solution is a separate detour, a fully functioning alternative route.

Alternative Routes

Vancouver has pent up capacity for a total of four (4) bridges:[5]

1) Interstate
2) Glen Jackson
3) Bi-State Industrial Corridor[6]
4) 192nd Ave. Eastside Crossing[7]

Glen Jackson and Interstate are already at capacity and neither can serve as a detour while the other is worked on. Before either Glen Jackson or Interstate is worked on one or other of the alternative routes, Bi-State Industrial Corridor or an eastside crossing, must be in place to serve as a detour during construction.

Bi-State Industrial Corridor Option 4

P-013-003

The most studied crossing option west of Vancouver, the Bi-State Industrial Corridor Option 4, is the most promising detour route during construction of the CRC Project. It is nearest to the CBD of Vancouver and would serve to divert truck traffic around the impacted areas.

Any chosen route will have its own obstacles. The trick is to find one that has no fatal flaws. The

---

[5] Oregon Department of Transportation: April 2003; Regional Economic Effects of the I-5 Corridor/Columbia River Crossing Transportation Choke Points, page 6 Table 1 Comparison of River Crossings in Selected Metropolitan Areas of Similar Size. http://www.columbiarivercrossing.org/FileLibrary/NonCRCRelatedDocuments/I-5_Partnership_Regional_Economic_Effects.pdf

[6] Southwest Washington RTC Transportation Corridor Visioning Study Report, April 2008; http://www.rtc.wa.gov/reports/vision/AppendixE.pdf

[7] Ibid

P-013-003

A "Bi-State Industrial Corridor" was one of the alternative crossing locations considered during CRC scoping, as discussed in Section 2.7 of the FEIS.

P-013-003

Third Harbor Tunnel in Boston serves as an example of a plan with a fatal flaw – it was scrapped because it was deemed too disruptive to a portion of Downtown Boston.

Please consider Bi-State Industrial Corridor Option 4 as a workable solution to the traffic staging problem with the Columbia River Crossing Project. Visit http://thirdbridgenow.com/ to see more detail of some of the possibilities.



-Thirdbridgenow.com – Northern Bridge-

Holistic Overview

Your professional team of designers will come up with the optimal traffic staging plan within the constraints of their model. However, you might want to revisit all of the available crossing points in the RTC studies. Viewed more holistically, options may emerge to build two new crossings, and renovate the two existing serviceable bridges, for near the same costs as are currently promulgated for the CRC Project.

Best regards,

Robert Dean, President

P-013-004



BOARD OF CLARK COUNTY COMMISSIONERS

proud past, promising future

CLARK COUNTY
WASHINGTON

Regional Transportation Council
RECEIVED
JUL 27 2010

July 22, 2010

The Southwest Washington Regional Transportation Council (RTC)
c/o Ms. Molly Coston, Chair
1300 Franklin Street, 4th Floor
Clark County Public Service Center
Vancouver, Washington 98666-1366

RE: Fourth Plain Boulevard Becoming a Major Freight Arterial/Corridor

Dear Chair Coston and Council Members:

The Clark County Board of Commissioners has been approached by members of the Shumway Neighborhood Association regarding the increasing volume of freight through established residential neighborhoods.

The Shumway Neighborhood Association has been actively working with the Arnada Neighborhood Association, Hough Neighborhood Association, Fruit Valley Neighborhood Association and the Carter Park Neighborhood Association to prevent Fourth Plain Boulevard from becoming a major freight arterial through these established neighborhoods.

While Clark County understands that the area in question is under the jurisdiction of the city of Vancouver, the concerned home and property owners are also located in Commissioner District 3. Thus, their outreach to the Clark County Board of Commissioners.

The Board of Commissioners respectfully asks RTC to include in its current work program a comprehensive freight access study of the entire transportation network west of and in connection with Interstate-5. We further respectfully ask all RTC member organizations to understand these well established residential neighborhoods' concerns for their livability, not to mention potential affects on home and/or property value if Fourth Plain Blvd.'s designation should change. We would hope (1) RTC staff will actively include and work with all of the neighborhood associations and (2) that this work would be completed before any public conversation about the proposed change in Fourth Plain's designation.

Sincerely,

Steve Stuart, Chair — Tom Mielke — Marc Boldt

1300 Franklin Street • P.O. Box 5000 • Vancouver, WA 98666-5000 • tel: [360] 397-2232 • fax: [360] 397-6058 • www.clark.wa.gov

P-013-004

Project staff would be more than willing to collaborate on a freight access study for west Vancouver. The project has done a considerable amount of analysis of freight movement in Vancouver. The project will improve traffic conditions in Shumway and elsewhere in Vancouver. Motorists who now avoid the congested Interstate are using local streets, and will return to I-5 when the congestion is relieved.

Hines, Maurice

From: Robert Dean [robert@deansurveying.com]
Sent: Sunday, October 16, 2011 9:37 PM
To: Columbia River Crossing
Subject: FEIS failed to address my concerns

Categories: Orange Category

P-014-001

The FEIS failed to address concerns I raised in January 2011 at at meeting with Don Wagner and Thayer Rorabaugh.

> This was their response. On construction mitigation they pledged to keep 3 lanes open throughout. That would be possible if people heed the admonition to choose alternative routes.
>
> Ken Cassavant was the prof I contacted. I have not heard of his findings.

Robert Dean
7101 NE 74th Ave.,
Vancouver WA 98662
(360) 892 2600

Sent from my iPhone

Begin forwarded message:

> **From:** "Wagner, Don" <WagnerD@wsdot.wa.gov>
> **Date:** January 4, 2011 3:09:05 PM PST
> **To:** <robert@deansurveying.com>, <leavitt@cityofvancouver.us>
> **Cc:** "Rorabaugh, Thayer" <thayer.rorabaugh@cityofvancouver.us>, "Holmes, Eric" <eric.holmes@cityofvancouver.us>, <jeanne.harris@cityofvancouver.us>, <wagnerd@columbiarivercrossing.com>
> **Subject: RE: meeting with Don Wagner**
>
> Robert, thank you taking the time to discuss your thoughts on the CRC project with me yesterday. After reading your memo to Mayor Leavitt I thought it best to clarify a couple of issues in that memo.
>
> First, in a couple of places you interpreted my comments related to the work of Bridge Expert Review Panel (BRP) to mean that I felt the Panel or the CRC project might be going with the "Kevin Peterson" design or that I don't believe anything will be built. That was not my intent. My comments were to convey that the BRP is looking a many different options for bridge design and alignment and at this time I don't know what they will ultimately put in their report. The BRP report will be processed through the local partners and ultimately will inform what bridge types are included in the FEIS. While I may not know which bridge

P-014-001

It is not clear what Mr. Dean believes the FEIS failed to address in this portion of his letter and the letter from Mr. Wagner to him. It is also unclear why Mr. Dean believes that three lanes on I-5 can be kept open during construction only if people choose alternative routes. Regardless, the project is committed to keeping three lanes open in both directions during construction. As the construction plans are further developed, we will work with interested citizens and neighborhoods on the specific details.

P-014-001

type will finally be built, I believe we were going to take the CRC project through to construction.

In your seventh paragraph you credit me with the following quote; "Tell it to the Columbian editorial board." While I agree that a comment very similar to this was made at the meeting, it was not made by me. As I was not the one who made the statement, I suggest you check with the person who made the statement on his exact wording and context.

In the eighth paragraph you indicate that I was meeting with the feds to find out who was the lead agency on the project. There is no question as to which Federal agencies are the lead agencies on this project. The Federal Transit Administration and the Federal Highway Administration (both divisions of the US Department of Transportation) are the lead agencies. They published the Draft Environmental Impact Statement in 2008 and they will publish the Final Environmental Impact Statement. They will ultimately issue the Record of Decision on the project.

In the ninth paragraph you indicate that my reference to the project being an issue in the last election might be "alluding to the election of Jaime Herrera I think". My comment was much broader than that. Several candidates at the local, state and federal level on both sides of the Columbia included positions on the CRC project in their campaigns.

Lastly, the BRP will be holding their last group work session on January 18 and 19. Their report is not scheduled to be delivered until January 31, 2011.

I hope this helps to better understand comments I made at our meeting.

Don Wagner

Columbia River Crossing

From: Robert Dean [mailto:robert@deansurveying.com]
Sent: Monday, January 03, 2011 6:45 PM
To: leavitt@cityofvancouver.us
Cc: Rorabaugh, Thayer; Holmes, Eric; jeanne.harris@cityofvancouver.us;

wagnerd@columbiarivercrossing.com
Subject: meeting with Don Wagner

January 3, 2011

P-014-002

Today I met with Don Wagner at his office between 1:30 and 2:30. Jeanne Harris arranged the meeting and was there briefly to introduce us. She had to leave for another appointment and so she asked Thayer Rorabaugh to stand in for her. Thank you Jeanne!

Don Wagner led off with assurances that he had read my previous letter on traffic staging and they were addressing my concerns. Thayer, also, had been forwarded from Tim Leavitt a similar letter which he had read. Thayer gave examples from past projects of how they work with local businesses and do their best for them. I expressed thanks to Tim Leavitt and the City for asking the right questions and for Resolution M3663. Don and Thayer said they are going through the list of caveats in the LPA to make sure they are addressing them.

I acknowledged their success with previous projects (Salmon Creek and Delta Park) and asked if they would do specific studies on this one to protect small businesses; especially since this project will last up to nine years. I mentioned legal (Executive Orders) and moral imperatives to look out for small businesses. I explained the 5 year refinancing problem building owners face and used my building in Hazel Dell as an example.

I gave Don the newspaper article on the WSU study of economic impacts of reconstruction of the locks and also Ken Casavant's bio and contact info. He seemed interested in pursuing my request.

I mentioned that the DEIS attributes an estimated $8 million annual savings to the trucking industry in 2030 with build out of the new bridge. Is that enough savings to justify $4 billion expenditure? Don responded that that was only for one aspect of benefits. I suggested that commuters would have no net benefit because we will be paying for it with tolls. Don said we would only be paying a third (let's see, $1.5 billion capital plus interest plus collection costs plus cost overruns =?).

I asked if there was a cost/benefit analysis for the project. No. Was he aware that Steve Stuart had asked for one for tolls? Yes. It has not been done yet because they do not have a final design (he implied that they might be going with the Kevin Peterson design).

We talked about the need for an SEIS and the political inertia involved. They both are aware of sunk costs and the benefits of spending money during design phase rather than as cost overruns later. Don Wagner said, "Tell it to the Columbian editorial board."

3

P-014-002

Please see the responses to these comments in Mr. Dean's letter (P-012-001 and P-012-002).

P-014-002

I had mentioned the need for an SEIS to Tom Warne earlier. He was very circumspect. I got the impression at this meeting that it is being discussed. Don Wagner said he is meeting this afternoon with the feds to find out who is the lead agency on the project. I suspect Tom Warne wants to know if an SEIS will be called for if they switch to the Kevin Peterson design.

Don mentioned that there are hundreds of ways for the project to fail. Most prominent causes are funding and political will. He mentioned voting (on light rail) and the last elections (alluding to the election of Jaime Herrera I think). He seemed melancholy to me and resigning himself to imminent failure of funding. He exchanged glances with Thayer as if they had just been talking about it before I came.

I said I did not know of anyone who wanted to see the project fail. Don disputed that. I said I am on the email lists and some want to see light rail fail and some want to see tolls fail but we all want a better crossing that we can afford and that does what it's supposed to do.

Don said several times things like "If this gets built" and "If they build this design" as if he has doubts that anything will be built and if anything it will be Kevin Peterson's design. He said the IRP Expert Panel will be reporting January 19.

We talked about the original scoping and that there was no justification in the record for rejecting the Bi-State Industrial Corridor. I suggested the need for a Supplemental Environmental Impact Statement going all the way back to scoping and goal setting. The number 1 goal should have been to relieve the choke points to commerce on the West Coast of the US and allow future growth. If the Bi-State Industrial Corridor failed question 6 in Step A Screening Report then did they ask the right questions?

Don mentioned that a westerly arterial, west of the lake, to Ridgefield was rejected about 20 years ago. I suggested that was a lot of freeway to build through a wilderness.

We talked about preserving the historic bridges. Don said they are spending tens of millions to mitigate for the loss of 1.5 acres of the Historic Preserve. The bridges themselves are doomed. They are seen as a safety hazard by WSDOT (legal justification for destroying them) and the bridge lifts are a nuisance to Downtown commerce.

We talked about retro-fitting the Interstate Bridges for seismic safety. Don said the $300 million cost was for the first stage only – piers.

P-014-002

Don and Thayer both dispute that the RR bridge can be raised. They say for 90' clearance above the water and at 2% grade the RR would land too far North to make the Vancouver yards. My preliminary calculations from the GIS say it would land under the Mill Plain Overpass.

I suggested they redo the RR bridge and build the Bi-State Industrial corridor with light rail, bike paths, etc. and have it paid for by the RR, Coast Guard and Ports rather than on the backs of Vancouver commuters. They scoffed that the RR, Coast Guard or Ports would pay for anything.

Thayer said most of the Port traffic goes East and there is little truck traffic between ports. I did not have a chance to dispute that as we moved on to other things.

Don said the rumor that they hope to toll both crossings (I-5 and I-205) is not true. He wishes it would go away. He did say they might consider pre-construction tolling as they are doing in Seattle. I suggested that was a good idea and that they should test their financial and traffic projections immediately before committing the $4 billion. I asked if any law changes were required for tolls. He said no federal changes for I-5 (not so for I-205) and some changes for Oregon and Washington.

I gave Jeanne Harris and Don Wagner signed hardcopies of the attached donwagnerletter.PDF

Robert Dean, President
Dean Surveying, Inc.
717 NE 61st St., #100
Vancouver, WA 98665
(360) 892 2600
fax (360) 256 1156

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders
***

*** eSafe2 scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders
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Hines, Maurice

From: Robert Dean [robert@deansurveying.com]
Sent: Sunday, October 16, 2011 9:44 PM
To: Columbia River Crossing
Subject: CRC failed to take public input on FEIS

I sent this to my congressional representative.

P-015-001

RCW 43.52.383
Compliance with open public meetings act.
(1) The legislature intends that the business and deliberations of joint operating agencies conducted by their boards of directors, executive boards, committees and subcommittees be conducted openly and with opportunity for public input.

(2) The board of directors, executive board, and all committees or subcommittees thereof shall comply with the provisions of chapter 42.30 RCW, in order to assure adequate public input and awareness of decisions.

I wondered how our local politicians would approve the FEIS if it detailed how local businesses would suffer "severe disruption" during 9 years of construction. How would they get reelected after condemning so many Downtown merchants to certain ruin?

Apparently, the CRC came to their rescue. They must have offered the 6 agencies the opportunity to approve the FEIS before it was finished or published so that the elected officials would not have to take personal responsibility for their actions.

C-Tran is a joint agency made up of elected representatives from Clark County and City of Vancouver. If the three City representatives on that subcommittee collude to approve the CRC FEIS they have to make their decision openly and with public input. They did not.

The City Council approved the unpublished and unfinished FEIS at a workshop June 27. No public input.
http://www.columbian.com/news/2011/jun/27/vancouver-city-council-discuss-crc-bridge/

The C-Tran board approved the unpublished and unfinished FEIS August 9 with the unanimous consent of the City of Vancouver 3-member sub-committee. Jeanne Stewart had been previously reprimanded for voting her own conscience on the C-Tran Board. Jack Burkman stated on the Columbian Forum that the three council members had agreed to vote for the unpublished FEIS at a workshop (presumably June 27).

http://www.columbian.com/news/2011/aug/09/c-tran-board-approves-crc-impact-statement/

Apparently, CRC officials have conspired with officials of the 6 local agencies to shortcut public input.

Please appoint an independent outside investigator to ensure that the letter and spirit of all laws are being complied with at the CRC and our local agencies.

Thank you for your work on our behalf.

Robert Dean, President
Dean Surveying, Inc.
717 NE 61st St., #100
Vancouver, WA 98665
(360) 892 2600
fax (360) 256 1156

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P-015-001

The FEIS and associated technical reports describe the impacts to businesses during construction. For more information, see Chapter 3.4 of the FEIS and the Economics Technical Report.

Significant work has gone into developing the CRC project, including an ongoing public involvement effort. The public involvement program includes numerous advisory groups to ensure that the values and interests of the community are reflected in project decisions. These groups include representatives of public agencies, businesses, civic organizations, neighborhoods and freight, and commuter and environmental groups. Feedback from the general public and advisory groups has been generally supportive of the project, including support for the transit, bicycle, pedestrian, highway, interchange, and financing elements of the project. See Chapter 2 (Section 2.7) of the FEIS for more discussion on the process used to develop project alternatives and select a Locally Preferred Alternative.

Following the close of the 60-day DEIS comment period and the selection of an LPA, a 10-member governor-appointed panel was formed to advise the Oregon and Washington DOTs on project development for the CRC project. The Project Sponsors Council (PSC) was charged with advising the project on completion of the FEIS, project design, project timeline, sustainable construction methods, consistency with greenhouse gas emission reduction goals, and the financial plan, as well as the number of lanes on the bridge. The PSC made recommendations after considering technical information, receiving input from relevant advisory groups, and reviewing public comments. See Chapter 2 (Section 2.7) of the FEIS for details on the PSC's recommendations, and Chapter 6 (Public Input on the Draft EIS) and Appendix B (Public Involvement) of the FEIS for a description of public involvement activities that occurred after the DEIS was published.

http://www.columbian.com/news/2011/sep/12/in-our-view-progress-by-crc/

Ryan,

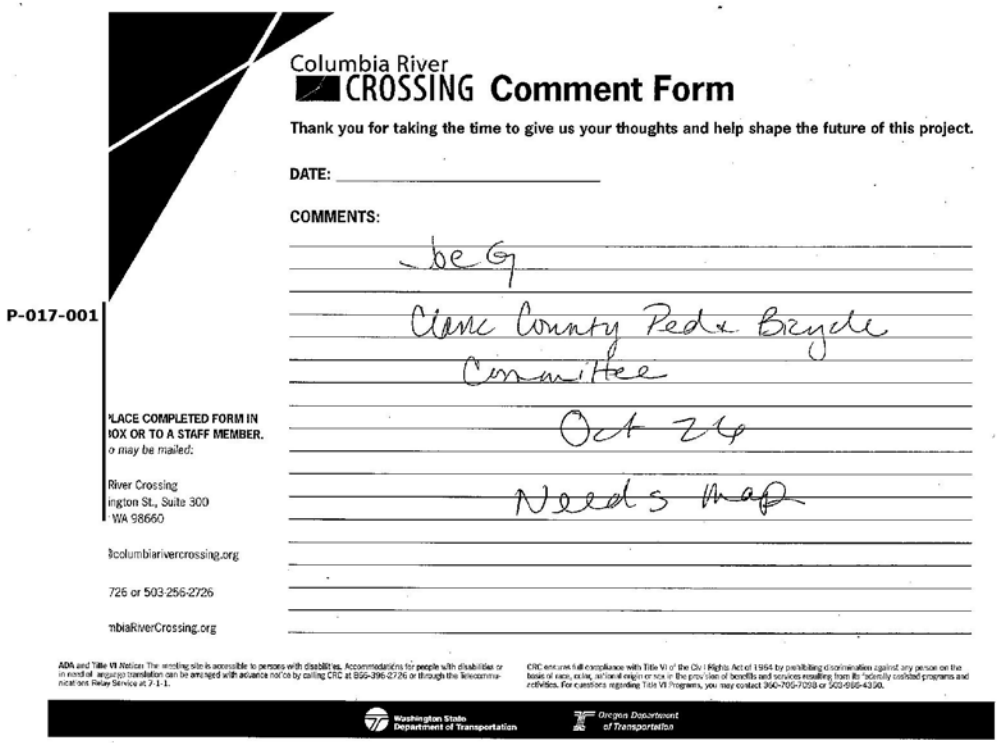
P-015-001 The Independent Review Panel called for more and better public input into the CRC. Jamie did also. Local officials have defied those instructions and now have violated Washington law.

From: Dennis [dennise219@comcast.net]
Sent: Friday, September 16, 2011 5:52 PM
To: Columbia River Crossing
Subject: FEIS email notification
Categories: Orange Category

P-016-001 I don't care if they ever put in a bridge in, they screw up all the roads and never obey the traffic laws. In other words stay on your side of the river.

P-016-001

Thank you for your comment. All comments received on the FEIS are shared with CRC project staff and included in the Record of Decision document.



Columbia River
CROSSING **Comment Form**

Thank you for taking the time to give us your thoughts and help shape the future of this project.

DATE: _____

COMMENTS:

be G
Clark County Ped & Bicycle
Committee
Oct 24
Needs Map

P-017-001

PLACE COMPLETED FORM IN
BOX OR TO A STAFF MEMBER.
o may be mailed:

River Crossing
ington St., Suite 300
WA 98660

columbiarivercrossing.org

726 or 503-256-2726

mbiaRiverCrossing.org

ADA and Title VI Notices: The meeting site is accessible to persons with disabilities. Accommodations for people with disabilities or in need of language translation can be arranged with advance notice by calling CRC at 866-396-2726 or through the telecommunications Relay Service at 7-1-1.

CRC ensures full compliance with Title VI of the Civil Rights Act of 1964 by prohibiting discrimination against any person on the basis of race, color, national origin or sex in the provision of benefits and services resulting from its federally assisted programs and activities. For questions regarding Title VI Programs, you may contact 360-705-7098 or 503-986-4350.

Washington State Department of Transportation

Oregon Department of Transportation

P-017-001

Please contact the project office for maps and future meeting requests. There are now very detailed maps online, but we can print/plot a large one for your future use.

Hines, Maurice

From: Allbefit@aol.com
Sent: Wednesday, September 21, 2011 10:37 PM
To: Columbia River Crossing
Subject: CRC and the Media Lie:

P-018-001

CRC Project: a few years ago two states spent one million dollars on this project. I spoke before Merto Council and asked to give me an opportunity and promised in a few days to improve traffic without big spending. My Offer was rejected.
Till today states spent $14.7 million on it.
And the media: the Oregonoan constantly continue to lie and continue to make politicians who paid it, named Cornilles a "leading candidate". Leading candidate? There was a forum of candidates, and the people shaked my hand for what I stand up, but not Cornilles hand, who support CRC I-5 Bridge. I oppose this bridge,
First, there is no need to replace I-5 Bridge: I promise to improve traffis.
No one taxpayers dollar will be spend on this project till I will improve traffic.
Second: yes, it would be good to create 2,000 jobs, but not on this, but other project, but again "but": where money will come from? Borrow from China, Russia and Jupan? NO!
//

To: We the People Pavel Goberman - Candidate (R) for US Repr. 1st Cong. Distr.
Campaign: "I Promise To Create Millions Jobs And Balance Budget".
P.O. Box 1664 FEC ID # C00487249
Beaverton, OR 97075 FEC OR ID # H 6
OR 01209
(503) 643-8348
www.getenergized.com and on left click on:
Vote
allbefit@aol.com getfit@getenergized.com

STATEMENT / REASON WHY I'M RUNNING FOR US CONGRESS:
Special Primary Election is on November 8, 2011

I don't see any one better than me could help this state and nation, and I have a concrete plan to help Oregon State and nation, and will be much beneficial than army of "experienced" US Senators, Congressmen, President and other candidates, who say: "We need, We must". I have an education, life and business experience. I'm honest, incorruptible (no not accept any "donation, contribution"), with faith, integrity and high moral principles, will not be a puppet in hands of donors and will not lose my dependency on We the People. For Government By and For the People.
As elected US Representative I promise to help: 1) In a few months to create a few thousands jobs in Oregon and a few millions jobs in the USA without raising taxes. Stop our dependency of foreign oil or it could cripple this country. 2) In a very short time to balance national budget, that saved nation $1 Billion a year paid on deficit interest, and even create a surplus. Debt is a terror against our country; Amendm. XIV, Section 4. 3) Save nation a few billions dollars on the health care.

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P-018-001

Preferences for specific alternatives or options, as expressed in comments received before and after the issuance of the DEIS, were shared with local sponsor agencies to inform decision making. Following the close of the 60-day DEIS public comment period in July 2008, the CRC project's six local sponsor agencies selected a replacement I-5 bridge with light rail to Clark College as the project's Locally Preferred Alternative (LPA). These sponsor agencies, which include the Portland City Council, Vancouver City Council, TriMet Board, C-TRAN Board, Metro Council, and RTC Board considered the DEIS analysis, public comment, and a recommendation from the CRC Task Force when voting on the LPA.

With the LPA, new bridges will replace the existing Interstate Bridges to carry I-5 traffic, light rail, pedestrians, and bicyclists across the Columbia River. Light rail will extend from the Expo Center MAX Station in Portland to a station and park and ride at Clark College in Vancouver. Pedestrians and bicyclists would travel along a wider and safer path than exists today.

For a more detailed description of highway, transit, and bicycle and pedestrian improvements associated with the LPA, see Chapter 2 of the FEIS.

P-018-001

4) Improve heavy traffic on all national highways and in cities. I will save $4 billion on Columbia Bridge, 5) Elect US Judges and Attorneys, but not appoint them, as it is now, that is a rape of our Constitution, 6) With this rotten judicial system many innocent people are in prisons. I will investigate Complaints, 7) Put some federal and state politicians, US and state judges and DA Schrunk (a mobster) in prison for official misconduct, that is a felony, for violation of the Constitution and the Code of Ethics for Government Employees,
8) Stop politicians and the big media junta to sell this country: take money off elections, 9) Improve the quality of education and discipline in schools. Teach children to respect parents, teachers and seniors. Teach children about danger of premature sex, because the taxpayers are paying for it. Prevent children obesity - give to children a jump ropes and I will do competition with them. 10) Harder punishment for crimes. Prisoners must work and pay back to society for damage, 11) Car / truck insurance. It is a "street robbery", extortion of money . If a person has no an accident, 50 % money back, 12) Stop send big money to countries where the people are saying: "Death America". Help own people. 13) Reduce income and property taxes, 14) Reduce the cost of drugs and gasoline, 15) Lock up borders to terrorists and criminals, 16) More students grants and loans must with no more than 3% interest, 17) Give a tax break to owners / landlords of Manufactured Mobile / Dwelling Homes and RV Parks for to keep them open,
18) NASA must concentrate now not on to fly on Mars and Moon, but on to fight natural disasters: to make clouds and rain to fight droughts and fires; prevent floods and hurricanes, 19) Stop the government of the USA from to make unconstitutional laws violating the freedom of citizens and businesses,
20) Stop the government of the USA to violate Amendment XIV, Section 1: steal citizens from other countries
21) Establish a child care on workplaces,
22) Everyone, not only judges. has a right for own protection keep physical address confidential,
23) Stop collection agencies to harass many innocent people, make them guilty without court order,
24) English must be official language,
25) Legalize Marijuana and others beneficial for patients drugs,
26) Ban on all lobbyists. They must have same rights as every voter,
27) Credit agencies and collection companies will have a legal responsibility for extortion of money,
28) Work with the United Nations develop one international language, 29) To make a peace on the Middle East. The approach to peace there is wrong, 30) Defend nation from a weapons of mass destruction,
31) The Oregon Public Broadcast must pay back to society for financial support and must inform and educate the public about candidates running for US Representative 1st Congressional District, but it refuses to do it. Call OPB: (503)244-9900 or 503-293- 4000

Pavel Goberman - "Unique political phenomenon", from article about me.

P.S. Democrats, in the Primary Nov. 8, 2011 Special Election, my name will not be in your Ballot. So, think, read the Voters's Pamphlet, and if you think I'm the best - write my name in Ballot. P.G.

Hines, Maurice

From: Brennen Hankins [b_hank26@yahoo.com]
Sent: Wednesday, September 28, 2011 2:23 AM
To: Columbia River Crossing
Subject: Jantzen Beach Interchange: Have your cake and eat it too

P-019-001

I read the the following article in *The Oregonian*, and I think I came up with a mutually beneficial solution: Why not stack the lanes of the bridge, ala the Queensboro Bridge in New York City, or, more locally, the Marquam bridge over the Willamette. It'd cut the width of the bridge nearly in half, yet you could still put in lanes without taken out all of the businesses or the harbor. Plus, you could put in an interchange with much more ease, thanks to the decreased width (i.e. since the freeway is stacked on top of itself, it would be possible to put in a left-side exit lane on the southbound lane, over where the previous freeway stretch runs, decreasing the need to buy up more land.)

Just something to consider.
-Brennen Hankins, Salem, OR

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P-019-001

The selected alternative proposes two stacked bridges across the river, with highway lanes on the top decks and light rail transit and a pedestrian and bike path on the lower decks. Other stacking options are possible but this configuration provides substantially better access and lower impacts than putting traffic on two separate levels and putting light rail or bike/peds on the top level.

From: Walter L Johnson [mailto:seniormoment@comcast.net]
Sent: Tuesday, September 13, 2011 12:06 PM
To: Columbia River Crossing
Subject: How much of the Columbia River Crossing project could be deemed either shovel ready or brought to that stage quickly?

P-020-001

How much of the Columbia River Crossing project could be deemed either shovel ready or brought to that stage quickly? I have been shocked that so little design work has taken place for the over $100 million dollars spent so far. Indeed it didn't appear that any of the elements in the project were able to qualify for special federal funding in the previous opportunity for shovel ready projects and now more than two years later I suspect the same is true.

When I worked for the Bureau of Public Roads about four decades back, the engineers did survey work one summer, designed the highway segment (four miles on that project) over the winter with the help of a small staff and a supervising engineer, and built it the summer after the land survey using a small crew engineering aids, all but one of whom were seasonal employees, plus one laboratory technician to test concrete and soil. And, the project was completed on time and on budget.

Now more than $100 million has been spent with not even a road widening related to the project insofar as I can tell.

Walter L Johnson

P-020-001

Considerable design work has occurred to advance the project through the NEPA process. The completion of the NEPA process marks the point at which a final alternative is selected and then can be advanced into final design. See the discussion of the process in Chapter 2 of the FEIS.

From: Walter L Johnson [SeniorMoment@comcast.net]
Sent: Saturday, September 17, 2011 7:07 AM
To: Columbia River Crossing
Subject: A potential bridge aesthetic feature
Categories: Orange Category

P-020-002

A friend from Vermont sent me this link, http://www.new-england-vacations-guide.com/covered-bridges-article.html and it raised in my mind the possibility of covering the I-5 Columbia crossing bridge, or at least the pedestrian portion of it with open views, to extend the life of the bridge surface, to draw tourists just like the Golden Gate Bridge, and to add an historically relevant feature given both our timber industry, and the age of the Fort Vancouver as the site of the Hudson Bay Company, and to end arguments over what kind of feature should be added to make the bridge unique.

Walter L Johnson

P-020-002

Thank you for thinking creatively about the project. We have, in fact, looked at coverings and found them to be generally too costly for the current economic conditions. However, the project has continued to find ways for covered project elements to contribute positively to the community's aesthetics. The pedestrian and bike facility under the roadway deck will provide rain cover for users, and will have 3,000 feet of spectacular views. There is also a lid included in the project, the Community Connector, immediately south of the Evergreen bridge.

Hines, Maurice

From: Herman Kachold [hkachold@msn.com]
Sent: Friday, October 14, 2011 1:57 PM
To: Herman Kachold
Subject: Fw: Audubon Flier on the West Hayden Island Alternatives
Attachments: Save West Hayden Island November 2011.doc

From: Bob Sallinger
Sent: Thursday, October 13, 2011 3:31 PM
To: 'Jonathan Ostar' ; 'Herman Kachold'
Cc: 'Donna Murphy' ; 'Pamela Ferguson' ; 'HILP'
Subject: Audubon Flier on the West Hayden Island Alternatives

Hi All,

P-021-001

Please see attached for Audubon flier on the two West Hayden Island Alternatives.

Side One makes the case for why no marine industrial development should occur on WHI and offers our vision for a permanently protected natural area
Side Two makes recommendations on the specific alternatives being offered in the event the city does proceed forward despite opposition.

Feel free to distribute as you see fit. We are using this document at the open houses.

Best

Bob

Bob Sallinger
Conservation Director
Audubon Society of Portland
5151 NW Cornell Road
Portland, OR 97210

(503) 292-9501 ext. 110

Help Save West Hayden Island Wildlife Area! Hundreds of acres of forest, meadow and wetlands at risk of being converted to parking lots! Go to http://www.facebook.com/home.php?#!/pages/Save-West-Hayden-Island/136664296349832?ref=ts

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*** IMPORTANT: Do not open attachments from unrecognized senders ***

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P-021-001

West Hayden Island is outside of the CRC project's study area.

P-021-001

We envision a fully restored 800+ Acre Wildlife Area and Nature Park at the confluence of the Willamette and Columbia Rivers: A place that provides habitat for more than 100 species including bald eagles, painted turtles, federally listed salmon and steelhead and extraordinary opportunities for people to hike, paddle and enjoy nature in an urban environment.

Visitors will explore a mosaic of wetlands, grasslands, beaches and one of the largest intact bottomland hardwood forests left on the Lower Columbia River. A new nature center will provide programs for children and adults about the unique role that confluence areas play in the migratory cycles of our imperiled fish and wildlife populations. Our local green economy will be supported by nature based recreation, restoration projects, and establishment of a regional mitigation bank to allow for marine development in more appropriate locations.

West Hayden Island will symbolize our commitment to restoring balance to our urban landscapes and leaving the land better than we found it for future generations

Audubon Society of Portland
Founded in 1902

Save West Hayden Island

October 2011



The City and Port continue to move forward with their efforts to pave over the West Hayden Island Wildlife Area for future marine terminals. This 826-acre natural area located at the confluence of the Willamette and Columbia Rivers represents one of the most important habitat areas in the city of Portland. The Port is currently in the process of trying to have the island annexed and rezoned so that it can build hundreds of acres of parking lots and marine industrial infrastructure---a facility for which there is no demonstrable need.

Pubic opposition to this project from conservation and community groups over the course of more than a decade has prevented the Port and the City from moving forward with annexation and rezoning. We are making progress! The Port's original demands for more than 600 acres of development have now been reduced to 300 acres and claims by the Port that it was physically impossible to build this facility at a smaller scale have repeatedly been proven false. Still this is a HUGE facility---more than 5 times the size of the Oregon Zoo-----more than 200 city blocks---that will be built in the middle of a floodplain. Even though no final decision has yet been reached on West Hayden Island, the Port is already filling the island's floodplains with tens of thousands of cubic yards of contaminated dredge materials from the Portland Harbor Superfund Site to prepare the island for development.

1) West Hayden Island is a critically important natural area:

- It contains 826-acres of intact habitat including 39 acres of wetlands, more than 100 acres of grasslands and 4% of the remaining intact cottonwood bottomland habitat between rivermile 12 and rivermile 145.
- It is home to at least 81 species of birds, 9 mammal species, 4 amphibian species (including bald eagles, western painted turtles, and provides critical habitat for federally listed salmon.
- It is designated as Class 1 riparian habitat and a "Habitat of Concern" under Metro's Title 13
- Former US Fish and Wildlife Service State Supervisor Kemper McMaster has written the West Hayden Island is considered "an important conservation asset regardless of its location. Its presence on and otherwise highly urbanized landscape accentuates its importance."

2) West Hayden Island is located almost entirely in the floodplain. In 1996, almost all of West Hayden Island was underwater. This is not the place to construct industrial facilities.

3) The Port of Portland has not justified destroying West Hayden Island to build a marine industrial facility. The Port has not sufficiently explored other opportunities such as collaboration with the Port of Vancouver to make more efficient use of the industrial land supply.

4) The new bridge (yes, another new bridge!) that would be required to support development on West Hayden Island will cost over $100 million of your tax dollars.

5) East Hayden Island is currently one of the most park deficient areas in the City: Protecting West Hayden Island as a natural area would create outstanding recreational opportunities to enjoy nature in North Portland and it would undoubtedly become one of the regions premier natural areas.

To stay up to date on efforts to permanently protect West Hayden Island, check out our Save West Hayden Island Facebook Page.

For more information contact Audubon Conservation Director, Bob sallinger at
bsallinger@audubonportland.org

City of Portland Open Houses

P-021-001

The City has produced new concept plans that will available for public review over the next two weeks. Please go to one of two open houses to comment on these concept plans. It is important to send three key messages:

1. No development should occur on West Hayden Island---it is a critical fish and wildlife area that should be protected in its entirety

2. If the city does proceed forward with annexation and rezoning, we recommend the following elements be incorporated from the two draft concept plans:

    - Development Footprint: Audubon supports Option B. Option B results in the least fragmentation and disturbance and highest ratio of interior to edge habitat in the remaining habitat that remains. It will result in a much healthier landscape over the course of time. Option A significantly fragments much of the remaining habitat--because of this is real footprint is close to 450 acres rather than 300.

    - Recreation: Audubon supports a modified Option B. We believe that additional recreational opportunities could be added to option B. However it is important to leave portions of the island untrailed. We support the concept that parking, boat ramp and nature center and other amenities should be at the edge of the natural area (ideally east of the bridge rather than in the middle. Option A places parking, roads, boat ramps into the interior of the habitat areas and fragments the entire island with trails.

    - Bridge: Audubon is not for or against a bridge to West Hayden Island. However if a bridge is built, Option B would minimize its impacts whereas Option A would require even more fragmentation of the remaining habitat

3. The City must complete additional studies before making a decision. these include:
    - Alternative site analysis--specifically regarding more efficient use of existing industrial land base in Portland Harbor and collaboration with the Port of Vancouver
    - Cost/ Benefit analysis including assessing impacts on the health and livability of nearby communities
    - On and Offsite Mitigation Plan

4. Any development that does occur needs to be completely mitigated in a way that results in a net increase in ecosystem function



West Hayden Island Grasslands

Hines, Maurice

From: Art Lewellan [lotilivo@gmail.com]
Sent: Thursday, September 29, 2011 11:08 AM
To: Columbia River Crossing
Cc: Art Lewellan
Subject: The CRC Hayden Island interchange design is unsafe, bloody unsafe...

Categories: Orange Category

P-022-001

The CRC as proposed does not create SAFER access to Hayden Island. Statistical accident rate & severity is worse. Both exits onto Hayden Island are downhill which increases stopping distance. Exiting traffic must come to a complete stop at a "T" with forced turns. Stopped traffic backs up while waiting for traffic entering the freeway to pass. Faster freeway speeds lead to faster exiting onto less visible downhill ramps with backed-up traffic and little emergency escape space. The design 'creates' a pair of extremely dangerous exits.

The Hayden Island interchange design is NOT SAFE for motorists nor pedestrians as air, water, noise, land-use & redevelopment potential, and island traffic management overall are worse than existing ramps and alternative designs.

P-022-002

The public deserves a 'fair review' of the CRC Commission's own Off-island Access Alternative Concept #1 -plus- building ONLY the Southbound bridge and using both existing bridges for northbound lanes. (Using both exiting bridges for northbound traffic improves safety.) The eventually-built northbound bridge replacement does NOT need a lower deck. Being lighter, it can be an elegant cable-stayed design to complement the utilitarian stressed-truss of the southbound bridge.

P-022-003

This phased approach to the CRC project sets up a traffic pattern that necessitates further study of northbound interchange designs in Washington State. It most likely reduces costs, but more important, achieves higher safety standards. I blame Wsdot more than ODOT for the recklessly inferior engineering. Wsdot's bored tunnel under downtown Seattle guarantees demolition of historic Pioneer Square and other downtown towers, but Wsdot only serves automobile-related business interests who profit from car-dependency. The tragedy of highway & traffic-related deaths is irrelevant to Wsdot directors and department heads.

Art Lewellan
1020 NW 9th #604
Portland 97209

P-022-001

The proposed grades and deceleration and acceleration lengths for the ramps to and from Hayden Island will meet ODOT and AASHTO standards. This will be an improvement compared to the existing interchange. The biggest improvement will be on the northbound entrance ramp where virtually no acceleration space is provided for the existing ramp. This is where the highest accident rate is recorded in the project area. The northbound and southbound exit ramps are similarly improved where the current deceleration is about 50% and 80% of standard, respectively, and the improvements will exceed the required standard. In all cases, the stopping sight distance provided will meet standard. Other improvements include the braiding of the ramps between Marine Drive and Hayden Island and the construction of the local bridge, both of which will serve to reduce the number of conflicts on the mainline and help improve the operations on the ramps.

P-022-002

The supplemental bridge alternatives evaluated in the EIS are very similar to the proposal you describe. Many different project components and alternatives were considered for the CRC project. Please see the summary of the alternatives evaluation process in Chapter 2 of the FEIS, which includes references to source documents on the alternatives screening process, and the reasons that the LPA is the selected alternative.

P-022-003

The traffic and highway engineers have designed the LPA to improve safety with full-build or with the phased option. Any future construction phasing will be analyzed to ensure safety in the roadway design.

Hines, Maurice

From: Lotilivo@gmail.com
Sent: Thursday, September 29, 2011 11:10 AM
To: Columbia River Crossing
Subject: Comment for Project Sponsors Council

Categories: PSC Comment

From: Art Lewellan
E-Mail: Lotilivo@gmail.com
Comment or Question:

P-022-004

The CRC as proposed does not create SAFER access to Hayden Island. Statistical accident rate & severity is worse. Both exits onto Hayden Island are downhill which increases stopping distance. Exiting traffic must come to a complete stop at a "T" with forced turns. Stopped traffic backs up while waiting for traffic entering the freeway to pass. Faster freeway speeds lead to faster exiting onto less visible downhill ramps with backed-up traffic and little emergency escape space. The design 'creates' a pair of extremely dangerous exits.

The Hayden Island interchange design is NOT SAFE for motorists nor pedestrians as air, water, noise, land-use & redevelopment potential, and island traffic management overall are worse than existing ramps and alternative designs.

The public deserves a 'fair review' of the CRC Commission's own Off-island Access Alternative Concept #1 -plus- building ONLY the Southbound bridge and using both existing bridges for northbound lanes. (Using both exiting bridges for northbound traffic improves safety.)

The eventually-built northbound bridge replacement does NOT need a lower deck. Being lighter, it can be an elegant cable-stayed design to complement the utilitarian stressed-truss of the southbound bridge.

This phased approach to the CRC project sets up a traffic pattern that necessitates further study of northbound interchange designs in Washington State. It most likely reduces costs, but more important, achieves higher safety standards.

I blame Wsdot more than ODOT for this recklessly inferior engineering. Wsdot's bored tunnel under downtown Seattle guarantees demolition of historic Pioneer Square and other downtown towers, but Wsdot only serves automobile-related business interests who profit from car-dependency. The tragedy of highway & traffic-related deaths is irrelevant to Wsdot directors and department heads. Blood is on their hands.

Art Lewellan
1020 NW 9th #604
Portland 97209

1

P-022-004

Please see the responses above.

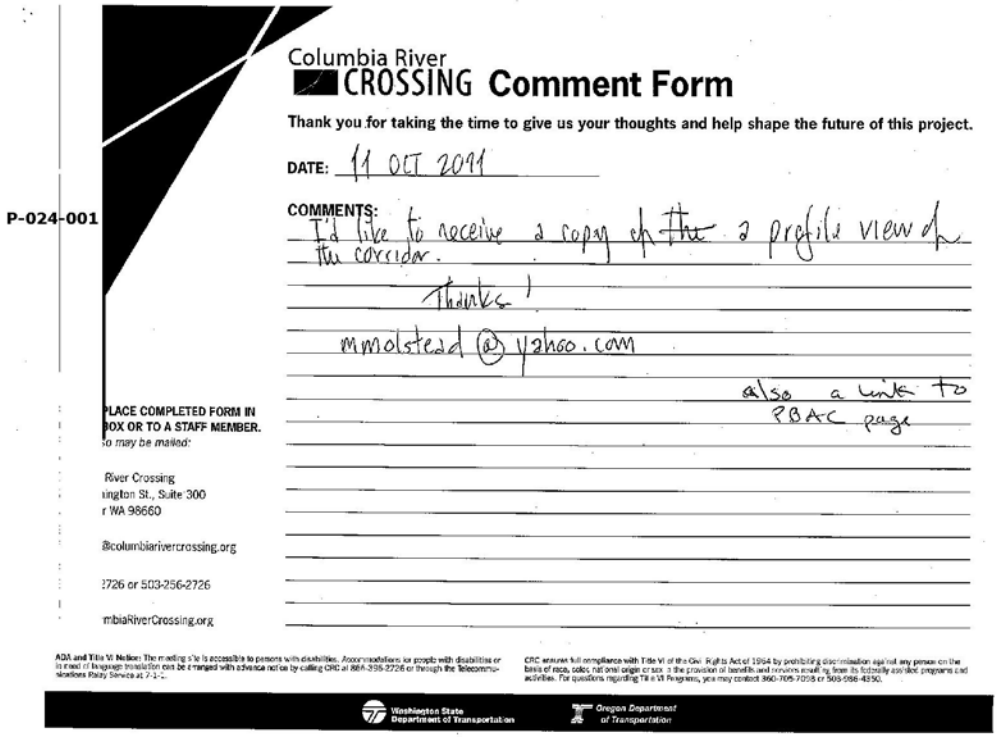
-----Original Message-----
From: rmoewe@aol.com [mailto:rmoewe@aol.com]
Sent: Tuesday, October 04, 2011 7:44 AM
To: Columbia River Crossing
Subject: Comment from CRC Submit Comments Page

From: richard moewe
E-Mail: rmoewe@aol.com
Comment or Question:

P-023-001 Who/how do I reach. I am semi retired from 30 yrs in transit construction management, looking to downsize and live in WA. Join WDOT or ODOT for this specific project. Please point me in the right direction

P-023-001

Please visit the ODOT and WSDOT websites for more information about job openings and contracting opportunities.



Columbia River
CROSSING **Comment Form**

Thank you for taking the time to give us your thoughts and help shape the future of this project.

P-024-001

DATE: 11 OCT 2011

COMMENTS:
I'd like to receive a copy of the 2 profile views of the corridor.
Thanks!
mmolstead@yahoo.com
also a link to PBAC page

PLACE COMPLETED FORM IN
BOX OR TO A STAFF MEMBER.
o may be mailed:

River Crossing
ington St., Suite 300
r WA 98660

@columbiarivercrossing.org

2726 or 503-256-2726

mbiaRiverCrossing.org

ADA and Title VI Notice: The meeting site is accessible to persons with disabilities. Accommodations for people with disabilities or in need of language translation can be arranged with advance notice by calling CRC at 866-396-2726 or through the Telecommunications Relay Service at 7-1-1.

CRC ensures full compliance with Title VI of the Civil Rights Act of 1964 by prohibiting discrimination against any person on the basis of race, color, national origin or sex in the provision of benefits and services resulting from its federally assisted programs and activities. For questions regarding Title VI Programs, you may contact 360-705-7098 or 503-986-4350.

Washington State Department of Transportation | Oregon Department of Transportation

P-024-001

The profile was sent to you on the 21st of October. If you would like any additional information, please contact the project office.

From: fredtrain@aol.com [mailto:fredtrain@aol.com]
Sent: Saturday, September 17, 2011 8:26 PM
To: Columbia River Crossing
Subject: Re: CRC's Final Environmental Impact Study

P-025-001 Excuse me. The FEIS isn't only supposed to be another propaganda piece. It's supposed to answer all the comments received on the DEIS. You got a lot of substantive comments about the faulty assumptions, analysis and conclusions in the DEIS and documents leading up to it. Some comments were quite extensive in their scrutiny and suggestions of alternatives.

Fred Nussbaum
6510 SW Barnes Road
Portland, OR 97225
503.292.5549

-----Original Message-----
From: Columbia River Crossing Project <feedback@columbiarivercrossing.org>
To: FredTrain <FredTrain@aol.com>
Sent: Thu, Sep 15, 2011 9:17 pm
Subject: CRC's Final Environmental Impact Study

You're Invited

to learn about plans to address safety and traffic problems on I-5.

Publication of the Columbia River Crossing (CRC) Final Environmental Impact Statement (EIS) brings the project closer to completing the planning phase. The Final EIS contains analyses of the project's potential environmental and community effects. It also describes how a replacement Interstate Bridge, light rail and other project elements will improve safety and relieve congestion.

Drop-In Information Sessions
Wednesday, October 12, 2011
2 – 4 p.m. and 6 – 8 p.m.
Vancouver Community Library
901 C Street, Vancouver, WA 98660

Thursday, October 13, 2011
2 – 4 p.m. and 6 – 8 p.m.
Jantzen Beach SuperCenter Community Room
1405 Jantzen Beach Center, Portland, OR 97217

PLAN YOUR TRIP: www.trimet.org or www.c-tran.com

For more information about the FEIS drop-in information sessions please visit our website.

Direct questions or comments tofeedback@columbiarivercrossing.org

P-025-001

The level of detail in the DEIS was intended to inform the public and other stakeholders with relevant information in order to understand the impacts and trade-offs associated with various alternatives. While some readers felt that the DEIS did not have enough detail, others felt that it was too long and detailed.

Public open houses and numerous public meetings were held to provide opportunities for public participation. Additionally, the project team attempted to respond to questions about the location of certain information in the DEIS during the DEIS comment period. Comments on the DEIS have been considered, and were further discussed and assessed at numerous meetings following the selection of the LPA. There are many ways in which the comments on the DEIS have influenced the project's design. The changes to the project which were initiated by citizen input are discussed in Chapter 6 (Public Input on the Draft EIS) of the FEIS.

Hines, Maurice

From: fredtrain@aol.com
Sent: Friday, October 14, 2011 1:18 AM
To: Columbia River Crossing
Subject: URGENT: Can't find FEIS Comment period information when searching your site

P-026-001

I have been searching your web site in vain for information on the FEIS and the comment period for the FEIS. All I get is a listing of DEIS topics. Not only is this frustrating, but you may be violating federal public input rules. It is my understanding that the end of the Comment Period is near. I need to know when that is and I need to know it immediately.

Thank you,
Fred Nussbaum
6510 SW Barnes Road
Portland, OR 97225
503.292.5549

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P-026-001

The FEIS and details on the review period were available on the project website during the entire review period. Upon reciept of his email, project staff contacted Mr. Nussbaum by phone to direct him to the requested information on the website. It is important to note that, when adding them to the website, care was taken to ensure that links related to the FEIS were easy to find.

Terry Parker for Metro

to make a difference

P.O. Box 13503, Portland, Oregon 97213 - 0503 Phone: 503 284-8742
parkert2012@gmail.com

Subject: Comments to the Columbia River Crossing October 12, 2011

P-027-001

While I can support the decision already made to construct a new I-5 Columbia River Crossing between Portland and Vancouver: I do however believe there is a less expensive option that "should" have been fully explored. Such an option would have included a new, safer I-5 bridge for through traffic coupled with an earthquake retrofit and repurposing the existing historical bridges for local traffic, transit alternatives, bicycles and pedestrians. With a Locally Preferred Alternative already chosen, I view a lower cost option of this type as a fallback plan B if the dollars for the LPA don't materialize. Since LPA will remove the existing bridges at a cost of well over a million dollars; at the very least, the existing bridge spans – currently in good shape - should be saved and reused someplace where a bridge or bridge replacement is needed.

What I can NOT support is the current CRC funding plan. All the dollars for the entire project - including nearly $900 million for light rail - directly or indirectly are coming from highway user paid taxes and fees. New Starts funds, for example, are siphoned off from the Federal Highway Trust fund that is supported by the federal taxes on motor fuels. The additional projected $400 million in federal dollars that could possibly come from a Highway Projects of National and Regional Significance program are likewise from the Federal Highway Trust Fund. The latter dollars however appear to cover little more than the potential projected cost of the bicycle infrastructure. The $450 million each the states of Oregon and Washington are expected to kick in will also come from taxes on motor fuels and other highway user paid fees. That leaves nearly $1.3 billion to be extracted through another mechanism which is tolling.

I-5 is the primary West Coast interstate commerce corridor between Canada and Mexico. Where are the federal dollars for the highway component of the CRC? Being the principal stakeholders, where is the representation or even a CRC working advisory group for the motorists? Commuters driving from the Washington side of the river have been contributing $150 million each year into the Oregon treasury, plus much more into the Oregon economy. That could even increase with expansion of the Silicon Forest in Washington County. The CRC is a multi-mode project with three basic legs; highway, light rail and bike/ped. Yet 100% of the existing funding scheme to pay for the entire project is coming from only one leg. Tolling only the highway users, especially hammering the working class commute time highway users with congestion priced tolling, amounts to a prejudiced redistribution of wealth. The "big hole" in the bridge plan is the lack equity and fairness. Charging the highway users high and excessive tolls will only have a negative impact on jobs and the local economy, especially for small businesses and small service companies that have accounts on both sides of the river. Since the benefits of a new crossing will be shared, then so must the sacrifices.

A cultural shift needs to take place that equitably balances the user fees by justly distributing the costs for a new CRC to the users of all vehicle modes including tolls for bicycles and a surcharge on transit fares while minimizing the highway tolls. Additionally, broadening the funding base is a step in the right direction for alternative transport infrastructure to become more financially self-sustainable while also providing a steady revenue stream less impacted and interrupted by oil prices, commuting tends or traffic projections. The reality check is that some tolling must occur for this project to be built. Taxpayer equity requires that all bridge users contribute and pay a proportional share of this needed economic generator and transportation project.

Respectfully submitted,

Terry Parker

P-027-001

Many different options for addressing the project's Purpose and Need were evaluated in a screening process prior to the development and evaluation of the alternatives in the DEIS. Options eliminated through the screening process included a new corridor crossing over the Columbia River (in addition to I-5 and I-205), an arterial crossing between Hayden Island and downtown Vancouver, a tunnel under the Columbia River, and various modes of transit other than light rail and bus rapid transit. Section 2.5 of the DEIS explains why a third corridor, arterial crossing of the Columbia River, and several transit modes evaluated in screening were dropped from further consideration because they did not meet the Purpose and Need. For a general description of the screening process see Chapter 2 (Section 2.7) of the FEIS. It should be noted that every proposal received from the public was considered, and many of the proposals that were dropped from further consideration included elements that helped shape the alternatives in the DEIS. The issue of adverse impacts to businesses, resulting from tolling, was addressed as part of the economics analysis and is described in detail in the Economics Technical Report. This report, and Chapter 3 (Section 3.4) of the DEIS, note that the increased costs incurred because of tolls would generally be offset by the improved travel options and travel times. Under existing and No-Build Alternative conditions, congestion delays and high crash rates have significant costs for local businesses and travelers; improving these conditions is one of the purposes of the project. Tolls could discourage home-based shopping trips from Clark County to points in northern Oregon, such as Hayden Island and Airport Way. However, the variable-rate toll structure that was evaluated in the DEIS allows for different rates to be charged by time of day. Therefore, discretionary trips, such as those between Oregon and Washington for retail purposes, could be taken in off-peak hours when toll rates are at their lowest, reducing the effect of the tolls on these types of trips. Also, CRC would provide improved transit connections between Clark County and Oregon, offering travelers a toll-free alternative for reaching

destinations across the river. Details of the tolling system are still being refined as the project development enters the final design stage. It is currently not anticipated that transit users, bicyclists, or pedestrians will pay a toll. Additionally, certain toll discounts or waivers for other groups have been and will continue to be considered. The ultimate decision on any tolling options will be made by both the Washington and Oregon Transportation Commissions.

From: King, James
Sent: Monday, September 19, 2011 11:27 AM
To: Francis, Carley; Hines, Maurice
Cc: document.control
Subject: Second D. Peterson Call - total project cost of acquisitions numbers

Good morning,

Debbie Peterson called me directly this morning at 11:09 am. I spoke with her for two minutes. She iterated her request from her earlier voicemail – which I've since forwarded to you both earlier this morning.

P-028-001

Ms. Peterson is asking for, "total project cost of acquisitions numbers, for both highway and transit, broken down by parks, business and homes."

She indicated that she was certain this information was in the newly released FEIS but she could not find it. Ms Peterson said she would hold for the answers, as she was sure we were asked for this data all the time and that she was sure that I would have the data handy for her. I indicated to Ms.Peterson that, "the leg work to get her those numbers would take some time to complete."

JK

P-028-001

Ms. Peterson received a response to her request on October 7, 2011.

From: "Kevin Peterson" <petersondesign@centurytel.net>
To: "Lenzi, Jerry" <LenziJC@wsdot.wa.gov>
Cc: "Boyd, Nancy" <boydn@columbiarivercrossing.com>
Subject: cemetery
Hi Jerry,

P-029-001

The attached paper is what my understanding of the cemetery issue is.

Also attached is a paper put together on potential benefits to Fort Vancouver for the straight alignment.

Both are good reads and communicate my basis for suggesting that the claim a cemetery exists or burials where the C-D straight alignment is placed is likely less of a cultural resource disturbance than the proposed downstream alignment.

As always, please do point out where I might be wrong. I have no intention of misrepresenting the truth as this is, in my opinion, an unprofessional thing to do.

Best regards,

Kevin

P-029-001

Project staff have reviewed the paper Mr. Peterson provided that suggests an upstream replacement I-5 bridge with a straight alignment would result in fewer disturbances to cultural resources. The decision to build a replacement bridge downstream of the existing bridge is one that has been vetted and analyzed carefully, subsequent to a rigorous technical and public process. Since 2005, CRC has involved the Fort Vancouver Historic Trust, the National Park Service, the City of Vancouver, more than a dozen tribal governments, and other state and federal agencies in the development and review of technical information. The general public and multiple stakeholder groups have also been engaged as part of a robust public process which boasts over 950 public events and meetings to date.

Staff have discussed Mr. Peterson's ideas with him on multiple occasions in 2010 and 2011. He also had the opportunity to present to the CRC Bridge Review Panel at the end of 2010. Many of the ideas that he brought forth had been previously considered during the past six year planning process for the CRC project. New ideas were also evaluated by project staff and the Bridge Review Panel after meeting with him. An upstream alignment was considered but rejected during the alternatives development process because of the reasons described in the DEIS and FEIS, and these reasons remain valid.

Cemetery Concerns
Is a cemetery located near the River?

Contents

Abstract
Background
Cemetery Locations
Informal Burials near Historic Cemeteries
River Edge Burials and Human Remains
Includes four figures
Conclusions
Appendix 1
Opinion Piece Published in The Columbian
Appendix 2
Excerpt from CRC EIS Section 4(f)

P-029-001

Abstract:
The CRC project office argues that human burials might be located in the vicinity of the historic village that adjoined the Hudson Bay stockade. The project office is concerned that disturbing human remains, especially those of Native Americans, is a serious concern influencing alignment choices. The project office claims that any I-5 alignment to the east of I-5 located near the river, as would be the case with the straight aligned collector/distributor option, presents a more likely probability of disturbing burials than would occur if I-5 is relocated downstream - even if the downstream alignment disturbs a half million additional square feet of land area than would the C-D straight alignment.

This paper explores this alignment concern. Information presented in this paper is based on fragmented information available to the author. As the author is not an archeologist, historian or has any unique education or skill regarding preliterate burial customs this paper is only intended to bring forth what facts are available and postulate on these facts. Care must be taken to avoid acceptance of arguments made for, or against, any alignment without careful vetting of information that is not available to the author. However, this paper deals with this issue as project office materials have not been made available to the author.

The conclusion reached relative to potential human remains is that human remains may be present but may not be burials and may be downstream of the historic village adjoining Fort Vancouver. Only one human remain has been found in this area and these scattered remains are inconsistent with a burial further suggesting a pre-contact burial ground does not exist. Burials during the historic period in all likelihood were not done within the context of household structures or building of the settlement village or adjoining agricultural lands suggesting that any remains are likely to be random and deposited at the

P-029-001 time of first contact or earlier. Understanding of pre-contact Native American land use in this area is uncertain although projectile points and other artifacts have been found throughout the area.

The single human remains near the historic village suggest that the larger the footprint of I-5 the more likely the project will encounter Native American remains. Locational distinctions within this area, that area between the shore line and 7th Street and within a quarter mile downstream of Fort Vancouver and the village, are less likely to be a determinant as the single human remain was not consistent with a burial grounds or cemetery.

Background

Native American populations were decimated by illness and disease when first exposed to Europeans. This tragic first contact period was one of shocking displacement due to the introduction of European land use and land control philosophies that caused a double hit to Native Americans – a terrible period of lost life, lost land and altered culture. Today we are more aware of the damage caused by enculturation and seek to respect the Native American population by honoring places where and when we encounter remains and remnants of these proud groups. For the Columbia River Crossing this is a heightened sensitivity to this past and a desire to cause as little negative impact as possible and honor and respect any disturbance that the project might cause.

We know the history of the area from the early ninetieth century when the Hudson Bay Company first located an outpost at the site. Before this period we have only archeological records and oral history to understand the pre-contact period.

This paper is void of detailed investigation of artifacts found at the site from this pre-contact period. Also, oral history that has survived is also not included in this paper. What is included is only the result of discussions with knowledgeable people and research of modern media.

The author fully admits to a bias on this subject. Native Americans were exploited by the European culture, which includes the culture of a young United States, and were not treated or honored in a way respectful to the First Peoples or consistent with Christian beliefs. If anything comes from this paper it is my hope that the presence of Native Americans can once again be felt at the site and future generations are given knowledge of pre-history, first contact and the need to share lands we commonly occupy and honor all those who make up the human condition and spirit.

Cemetery Locations

With the HBC came the first known cemetery. Located away from the river beyond the mission this cemetery is not in the area of the river and is not near to where the C-D Straight Alignment will be. With the US Military presence a second cemetery was created in which relocated remains in the first cemetery were moved to create one common cemetery. The second cemetery is further from the river than the HBC cemetery but closer to the 'cut' that is the 1950's I-5 construction. This second cemetery was itself relocated to a site even further from the river. Both cemeteries are not an issue for I-5 as

P-029-001

alignment choices for the freeway, the CRC curved downstream alignment of the C-D straight alignment, are essentially the same with respect to historic cemeteries.

Informal burials near Historic Cemeteries

In the 1950's when the I-5 'cut' was dug between Fort Vancouver and the city a number of burials, approximately a half dozen, were disturbed and relocated. My understanding is that these burials took place in the historic period. This suggests that to the north and west of both historic cemeteries were places where informal burials took place. Not to have included these burials within either formal cemetery might have occurred for a number of reasons that we are only to speculate about. Possibly the religious nature of the cemeteries precluded use by other religious peoples, the formality of a military fort limited burials to known people within the settlement population, deaths of those not part of the settlement might have been segregated from the formal cemeteries, racists attitudes brought about segregation, etc. The fact that burials were located to the north and west of both cemeteries is cause to anticipate the discovery of more remains if the 'cut' between Fort Vancouver and the city is increased – widened and/or lengthened.

Both proposed I-5 alignments have comparable, if not identical, impacts in this 'cut'. Both bridge alignments merge to share a common footprint at about Sixth Street so the impact on these informal burial sites is cause for the same care and consideration. The focus of concern is between the 'cut' and Columbia River and along the shoreline downstream of Fort Vancouver.

River Edge Burials and Human Remains

During construction of the pedestrian bridge one set of human remains were disturbed. These remains were scattered and shallow, dating to the period of first contact or before first contact. Archeological excavation suggests that these remains were not a burial consistent with other post-contact burials. These remains may have been an informal burial or may not have been a burial. If this person's body was not buried then the remains are that of an unfortunate death in which the remains were not attended to.

To assume that a cemetery is present in this area is incorrect. However, reconstructing the settlement and identifying sites where human remains are found is valuable. Certain assumptions can be made with respect to land use and the possibility of burials. For example, during historic times people were not buried within the town or village outside cemeteries. People were also not buried in agricultural lands. This suggests that the likelihood of informal burials is not likely within the village or agricultural areas.

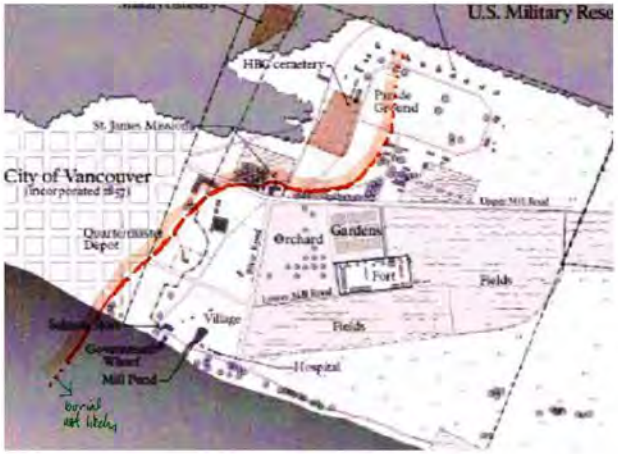


P-029-001

Figure 1

HBC plan of Fort Vancouver

Burials in 'The Village', agricultural areas or the 'Fort' are unlikely. North of Saint James Mission is the cemetery. The orange line is indicative of where informal burials might be found – to the Northwest of the village, mission and fort. Note that the dashed line bisecting the village is the approximate eastern edge of I-5.



P-029-001

Figure 2

Early US Military and City of Vancouver period

During this period the second cemetery was built just north and west of the HBC cemetery. Informal burials would be most likely found to the north and west of the City of Vancouver in the vicinity of the two cemeteries. Little likelihood exists of burials to the east and south of the orange line.

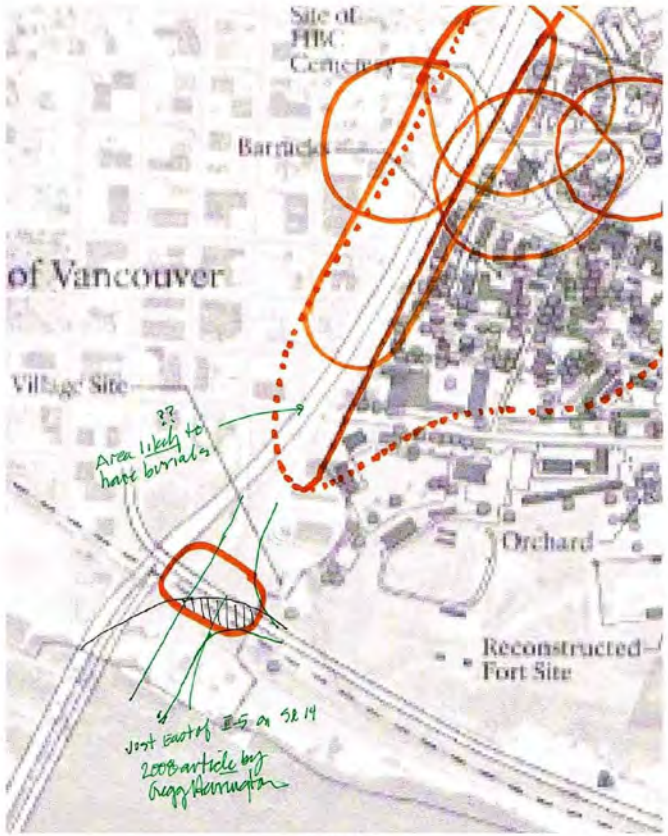


P-029-001

Figure 3

Early twentieth century map of Fort Vancouver.

In this map we see that the HBC cemetery has been replaced with military housing. Also of interest is the large parcel located just west of the military cemetery. Could this land have been envisioned to be a cemetery, park of buffer between the city and cemetery? Or might the presence of informal burials during the previous century have been a reason not to plat this land with typical city blocks?



P-029-001

Figure 4

Possible locations for informal burials?

This map brings together speculation on burial sites contained in the local newspaper article written on this subject a few years ago. This article is contained in appendix 1.

P-029-001

Conclusions

The two cemeteries at Fort Vancouver were located to the northwest of the stockade and the riverside village. Both cemeteries likely had informal burials outside the formal burial grounds in non-inhabited non-agricultural areas northwest of the cemeteries as witnessed by burial sites found when relocating I-5 to the trench between the fort and city. No 'burials' have been found southeast of the cemeteries in the vicinity of the village or stockade. However, one human remain was found in the vicinity of the SR-14 interchange. This remains date to the period of first contact or pre-contact and are inconsistent with burial due to the scattered nature of the remains. It is highly unlikely that the remains of this individual constitutes a 'cemetery' and is more likely a single event. This set of human remains might be typical to any location along the waterfront in the area of Vancouver or Fort Vancouver where trails and paths that existed before first contact or during the pre-settlement period of first contact are located.

Disturbing Native American remains throughout the area is a concern. This is because the area was a place where trails reached inland from the river and was a place where Native Americans likely gathered. Although no pre-contact Native American burial grounds have been found in the I-5 area the possibility of uncovering human remains should be anticipated regardless of alignment selected and is an issue likely more dependent on the extent of land disturbed than is the distinction between upstream and downstream of the existing I-5 bridge. It follows that minimizing potential disturbances is to minimize the footprint of the project.

The comparative land needs for I-5 alignment choices are therefore the land area needed north of the Columbia River and south of 6th Street. The proposed CRC downstream alignment results in a total of 1,525,000 square feet of disturbance compared with 852,000 square feet of disturbance for the C-D straight alignment, the possibility of disturbing pre-contact Native American remains is therefore much more likely with the currently proposed downstream alignment as this option disturbs approximately 673,000 square feet more than the C-D straight alignment.

However, both alignments share the need to widen the cut between Fort Vancouver and the city. This is the area where burials can be expected and the project is taking appropriate actions to mitigate disturbance. The project appears to be taking actions that exceed minimal requirements and should be complimented for this.

P-029-001

Appendix 1
Opinion piece published in The Columbian

Opinion - Ancestral hand guides bridge siting
by GREGG HERRINGTON Columbian staff writer

One of the reasons a new bridge across the Columbia River is likely to be built downstream of the present twin spans, rather than upstream, can be found in a two-story building inside the walls of the reconstructed Fort Vancouver, about a quarter mile from Interstate 5.

There, on the second floor of the climate-controlled archival storage facility, out of public view, is a tan, six-and-a-half-foot- tall, metal cabinet.

That's where they keep the bones.

Skeletal remains of nine Native Americans were unearthed between 1953 and 1955 when they were digging The Big Ditch through Vancouver. On March 31, 1955, the four-lane freeway was opened, replacing Highway 99 via Main and Washington streets as the primary north-south route through town. (More lanes were added in the late 1960s.)

By putting a new bridge on the downstream side of the two existing spans, there's less chance of digging up Indian bones. And Don Wagner does not want to dig up more Indian bones.

More than nine grave sites

Wagner, administrator of the state Department of Transportation for Southwest Washington, knows well what the experts say: There are more Native Americans and others interred near I-5 between Officers Row on East Evergreen Boulevard and state Highway 14, especially just east of I-5.
Who knows? There could be remains under the traffic circle at Evergreen Boulevard and Fort Vancouver Way and under Vancouver Police Department headquarters just south of there. Maybe there are bones a few inches below the basement floor of the old Kiggins House at Evergreen and West Reserve Street.
"You know there are grave sites beyond those nine," Wagner said. "So you know there are some issues there."

The land under and along the I-5 swath through downtown Vancouver "is a site with hundreds and hundreds of years worth of history on Native Americans and Europeans," he said. "We know the site is rich in cultural and spiritual values."

Wagner's interest isn't just historical. It's mostly about the future.

P-029-001

"I need to do a project there," he said. "We've got to bring this cultural conversation to the forefront and talk about the history of the site and discuss how we move forward knowing that people died and were buried in the footprint of the current transportation system."

"The cultural sensitivity of the property will be an influencing factor in where the bridge goes," Wagner added.

"The tribes might say it's OK so long as we don't disrupt bones. First, you've gotta find out what's there. Then you have to have the conversation about what's best to do."

The state has notified 29 Indian tribes about the quandary ahead. Of course, it won't be a quandary at all unless there's money for a new bridge. Based on what Sen. Patty Murray said in Vancouver on Wednesday, Congress won't be sprinting to write checks for this would-be project.

The bridge -- and the bones

Many of the old Vancouver Barracks bones are well-traveled. I talked this week with Doug Wilson, archaeologist for the Vancouver National Historic Reserve. Based on that interview and on a 2003 column by Columbian Editor Emeritus Tom Koenninger, here's where bones might be buried -- bones Wagner the bridge-builder doesn't want to find.

From 1839 to 1856, Europeans, Hawaiians and native Americans were buried in a Hudson's Bay Company cemetery south of the Officers Row parade grounds and north of East Fifth Street.

In about 1866, many of the remains were moved to a new Army post cemetery at what today is the west end of Officers Row, between I-5 and the traffic circle on Fort Vancouver Way.

In 1883, they were moved again, to any of three cemeteries still in existence, two on Fourth Plain Boulevard just east of I-5 and the Old City Cemetery at East Mill Plain and Grand boulevards.

The trouble is, says Wilson, "We don't think they got them all. We know that not all of the human remains were in the old cemeteries." And, as Koenninger wrote in 2003 about the Hudson's Bay Company graveyard, part of it "lies under asphalt and concrete streets, parking areas and ancient Army buildings."

Wagner, the highway builder, would really rather let them lie.

Gregg Herrington's column of personal opinion appears on the Other Opinions page each Friday.

Note by the paper author, Kevin Peterson:

Gregg wrote this article at a time when the project office was considering a freeway layout that pushed the replacement freeway deep into Fort Vancouver Park so that a single wide freeway deck, using twin bridges, plus a separate LRT bridge were placed upstream of the existing I-5 freeway. Also, the project was anticipating that a cloverleaf type freeway interchange with SR-14 was required. Readers should

P-029-001 *know that this solution is not the C-D straight alignment and would have been similar to the CRC project office downstream alignment without the 'S' turn. Don Wagner is correct stating concern that additional land take east of I-5 in the vicinity of the historic cemeteries is a worry. However, the C-D straight alignment is most definitely not a similar freeway philosophy! To construe that the C-D straight alignment is the same is intentionally misleading and not a truthful statement.*

P-029-001

Appendix 2
Except form CRC EIS Section 4(f)

SECTION 4(f) EVALUATION **5-15**
Archaeological Resources
Several archaeological sites, or archaeological contributing elements to the VNHR Historic District, are located in the archaeological Area of Potential Effect (APE). Several sites were likely impacted by previous construction of I-5 and SR 14. The archaeological APE also includes locations where a historic "military cemetery" may have been located.
While graves were exhumed and re-interred at another cemetery during the late 1800s, previous archaeological research has indicated that not all of the graves were relocated. Unmarked graves were apparently excavated during construction of I-5, and other potential grave shafts have been identified in the general vicinity of the historic cemetery. The exact location of the cemetery is withheld from this report because of the sensitive nature of the resource. The portion of the CRC project that overlaps the historic site of the cemetery, based on historic mapping, has been extensively altered by past excavations and construction.

- From chapter 5 of the DEIS

P-029-001

What's best for Fort Vancouver?

Three years ago the CRC project office put forward a specific idea – and alignment and layout – for replacing the I-5 bridges. This idea allows for a potential park like pedestrian lid over the freeway in the cut between upper areas of Fort Vancouver and the northern edge of the Vancouver CBD. In the vicinity of the river and lower downtown Vancouver, where the fort and city have a much longer history, this layout slightly worsens the impact of I-5 on Fort Vancouver; the freeway takes a bit more land out of the park and continues to be a barrier between the park and city. Near the stockade and historic village the proposed layout and alignment offer Fort Vancouver no betterment – just a slightly worse condition.

How might the proposed I-5 project benefit the park? I do not believe the park was consulted in regards to possible advantages the project might bring to the National Heritage Site or this information would be found within the CRC project office web site. I can be entirely wrong here but one must remember that the CRC project office uses only six problems as measures guiding design decisions for the project. It's best to list these as they provide insight to the attitude and actions of the project office - insight that leads one to realize that the project is not considering betterment as a basis for placing the freeway or the design of structures.

The SIX PROBLEMS:

1. **Growing travel demand and congestion**: Heavy congestion has resulted from growth in regional population, employment, and interstate commerce. The existing I-5 crossing provides three lanes for northbound and southbound travel, which can accommodate approximately 5,500 vehicles per hour in each direction. However, there are more people who want to use the crossing during peak periods than can be accommodated on the bridges, which results in stop-and-go traffic the mornings and afternoons. Cars getting on the highway have little room to accelerate and merge with highway traffic (short merging lanes) and have no room to pull off the highway (narrow shoulders) when an accident occurs or when vehicles break down. These conditions make congestion worse and decrease safety. Traffic can also become congested when large river vessels must use the lift spans to navigate underneath the I-5 bridges.
2. **Impaired freight movement**: Congestion on I-5 reduces freight mobility between regional markets in Portland and Vancouver, as well as national (California and other neighboring states) and international (Mexico or Canada) destinations along the I-5 corridor. Freight trucks most often travel in the middle of the day to avoid congestion. As hours of congestion continue to increase over time, travel times for freight trucks will continue to increase—even when traveling during the off-peak hours. This increases delivery times and raises shipping costs. It also negatively affects this region's economy. Truck-hauled freight in the Portland-Vancouver region is expected to grow more rapidly than other forms of freight movement (such as marine-hauled freight). Truck-hauled freight is forecast to grow from 67 percent of total freight movement in 2000 to 75 percent in 2035.
3. **Limited public transportation operation, connectivity, and reliability**: Congestion on I-5 reduces bus travel speeds and reliability. Local bus services currently travel between downtown Vancouver and downtown Portland. Express bus routes serve commuters by providing service directly from Clark County park and rides to downtown Portland. Both of these services travel over the I-5 bridges. Bus travel times from downtown Vancouver to Hayden Island increased 50 percent between 1998 and 2005. On average, local bus travel times are 10 to 60 percent longer during peak periods than during off-peak periods.

P-029-001

4. **Safety and vulnerability to incidents**: Over 300 crashes are reported annually on I-5 in the project area, making this one of the most accident-intensive section of I-5. This high accident rate is a result of multiple highway design features that do not meet current standards, including:

   - Close interchange spacing – within the CRC project area, I-5 has six interchanges spaced approximately one-half mile apart. The recommended minimum distance between interchanges is one mile so that cars entering and exiting the highway have enough distance to fully merge with traffic or diverge to the off-ramp before the next interchange.
   - Short on- and off-ramps – several on-ramps are not long enough for vehicles to reach highway speed before merging with highway traffic. Off-ramps are too short for safely slowing down, and may cause back ups from exits that block traffic on I-5. This generates traffic congestion and can cause accidents because maneuvering is difficult, especially for large trucks.
   - Vertical grade changes – a "hump" in the I-5 bridges that accommodates the Columbia River shipping channel blocks the view of roadway conditions ahead. This blocked view reduces speeds and creates potential hazards to motorists.
   - Narrow lanes and shoulders – several portions of I-5 in the project area have narrow inside and outside shoulders, while the I-5 bridges essentially have no shoulders, with less than one foot between the outside lanes and the barrier. The northbound I-5 bridge also has lanes one foot narrower than the minimum standard for a highway, and no shoulders. These conditions place vehicles very close to physical barriers and other vehicles, causing motorists to slow down, and do not provide space for broken down vehicles or emergency vehicles.
   - Hazardous river navigation – the Coast Guard has agreed not to raise the I-5 bridges' lift spans during peak traffic periods because of the substantial impact this would have on automotive traffic. This requires boats heading downstream (west) to navigate using the fixed "barge channel" near the middle of the river, and then quickly turn to line up with the narrow opening on the north end of the Burlington Northern Santa Fe (BNSF) railroad bridge, located about one mile downstream. This movement is especially difficult during high river levels.

5. **Substandard bicycle and pedestrian facilities**: The bicycle and pedestrian paths on the I-5 bridges are very narrow (four feet wide in most places) and extremely close to traffic and to the steel trusses. Also, the connections to these paths at both ends of the bridges are difficult to follow, especially around the Marine Drive and Hayden Island interchanges. Many existing non-motorized facilities cannot be used by persons with disabilities, and thus do not comply with the Americans with Disabilities Act standards.
6. **Seismic vulnerability**: The I-5 crossing is comprised of two bridges, one built in 1917 (the northbound structure) and the other built in 1958 (the southbound structure). The foundations of both bridges rest in soils that could liquefy during a major earthquake. Neither bridge was built to current earthquake safety standards.

What's missing? The urban and natural context for the freeway! No value is given to neighbors, urban uses and the sense of place that is Fort Vancouver.

Where are contextual issues? Where are integration goals? How will the freeway layout work with adjoining land uses to strengthen the viability of the urban area? Where is sensitivity to the cultural resources, including the park, that are so very important to the area? These concerns are not measurable attributes that the project has formalized to guide the critical decisions they are making.

P-029-001

These are positive outcomes of a planning and design process that embraces more than just 'six problems'.

If the project office does not provide insight then where is guidance to be found? Without this insight it is prudent to speculate on the park context and possible advantages the project might offer.

What measures are important to Fort Vancouver?

Access. The more people that are able to access the park the better the cultural resource is to the people of the region. The project should look to ways that encourage accessibility to the park, especially with a light rail line offering Portland metropolitan visitors potential access. An obvious example of improving access is locating and designing the LRT station as an entry to the park, lower Vancouver and the proposed waterfront development. Another example is a strong pedestrian connection between the historic park – the stockade and village - and the waterfront. Reinstating the historic linkage between the Vancouver city street grid and Fort Vancouver park also does this.

Historic Context. How can the freeway be configured so that a sense of historic context is achieved? This is a tricky question in that the fort itself is a history of change – from a Hudson Bay outpost to a spruce mill producing wood products used in WWI aircraft. However, the romantic and historically important period of the park might best be 1830 to 1880 when the fort and village were the focus of early settlement in the Pacific Northwest. This is a period in which Native American culture was replaced by western European influence and a young United States. The question posed to project engineers and architects is how might structures, which will occupy the western edge of this historic setting, help recall this period of time? How can the project help present the historic and important symbiotic context of fort, village and young city?

Land Take and Land Availability. Freeway layout and its design best serve the park if land is not unnecessarily taken. However, even more importance is the question of making land available to better facilitate and achieve park needs and functions. This is a proactive position that a project can take if civic leaders decide that an infrastructure improvement solves technical problems and betters the needs of neighbors. This is almost 180 degrees different from the CRC project office attitude that they need only solve six technical problems when planning and designing the freeway and bridge. How might Fort Vancouver benefit from more land? By connecting the fort with the river edge village and the lower Vancouver city street grid – the built environment that was the context between 1830 and 1920 – that's how.

To bring this sensitivity into the project in a coherent and thoughtful manner is only achieved by the action of talented, experienced architects and engineers acting under the leadership of civic minded visionaries who are willing to demand that the project is responsive to more than just solving six technical problems. Historic attributes can be the basis for responsive design if they are considered important to project leaders and are carefully and thoughtfully integrated into the design process. Unfortunately, this attitude seems lacking in the project office and is not considered an essential project

P-029-001

goal by state transportation leaders in Oregon or Washington. The burden falls on local and national leaders who may not have known this project has more than just one option or have not demanded context sensitive accountability from the project office. Qualitative influences seem only to exist as a mitigation tool within the CRC project office used to overcome negative feedback. For example, the idea of a pedestrian lid was a mitigation reacting to concerns put forward by the City Vancouver and the park.

The CRC project office did assemble an Urban Design Advisory Group, called the UDAG, which tried to inject some sensitivity into the actions of the project office. The value of this input to the project office is reflected in this group being disbanded. However, soon after this group was terminated by the project office, when they were no longer advising the project, they did send a letter to the two state governors recommending goals for the project. These are:

1. **Create suitable gateways to the States of Oregon and Washington**
2. **Knit together rather than divide neighborhoods along the way**
3. **Acknowledge and plan for wise use of the waterfront areas throughout the project**
4. **Help make the Columbia an important focus of the region rather than an obstacle to be overcome**
5. **Achieve a Columbia Bridge structure that is elegant, distinctive, timeless, and equal to the grand passage between two great states over the most important river in the region**
6. **Address and plan for improvement of traffic problems that the CRC will exacerbate in Downtown Portland**

These goals clearly express the desire of these design professionals and civic leaders to advance, or evolve, the project from an attitude limited to solving six problems to a positive attitude that strives to both create betterment and solve problems. These UDAG measures reflect a society that is seeking to best sculpt the project into a positive addition within the urban and natural landscape of the site and region.

The C-D Straight Alignment – How Does This Play Into the Debate?

The CRC project office has only been able to demonstrate one layout and alignment that satisfies the 'SIX PROBLEMS'. This one idea is the curved downstream alignment. Almost two years ago I was asked by a few Portland area designers for my thoughts on the direction the project was taking. It was clear to me that if only one layout and alignment opportunity existed, just a single possibility as the project office claimed, then the project was acting in a responsible manner. Any insight I might therefore have would be directed to the shaping the design of this layout – an action usually done during preliminary design that usually follows EIS discovery and documentation. It was clear to me that the only value I might offer was to be certain that a better layout and alignment does not exist.

Checking with transportation design professionals I was told that the 'unprecedented' number of interchanges too closely spaced was the 'key' problem this project was coping with. This made sense and was readily apparent as the proposed freeway alignment undulates and curves to fit interchange

P-029-001 ramping criteria - so that cars could access the single freeway deck - while placing the structure above the ship navigation channel /BNSF line and below the air navigation envelopes of Pearson Airport /Portland International Airport. I knew if interchanges could be 'unbraided' from the freeway then the layout and alignment might be able to be fit into the urban context much more responsively. How might this be done?

WSDOT Roadway Design Manual provides designers with two choices when interchanges are too closely spaced. These are to use a collector-distributor or grade separated braided ramps. From the WSDOT design Manual we find:

> The minimum spacing between adjacent interchanges is 1 mile in urban areas, 3 miles on the Interstate in rural areas, and 2 miles on non-Interstate in rural areas (see Exhibit 1360-3). In urban areas, spacing less than 1 mile may be used with C-D roads or grade-separated (braided) ramps. Interchange spacing is measured along the freeway centerline between the centerlines of the crossroads.

The project office had employed a host of ramping philosophies to fit interchange ramps into the project. These consist of braided ramps, frontage roads, auxiliary lanes, short collector-distributors and other modifications to interchange ramping that 'spread out' merging lanes along a longer length of freeway. By doing this the project office was able to meet WSDOT criteria. The result is what we see today; a potpourri of ramping solutions with over a dozen conflicts in just over a mile.

The only recourse open to me was to consider a collector-distributor. Placing the collector-distributor under the mainline freeway opened up the possibility of a straight aligned freeway and greatly reduced interchange complexity which then reduced land needs. Please refer to other documents to understand technical aspects and overall advantages of this 'C-D Straight Alignment'. This notion reduces the footprint of I-5 to less than that of the existing freeway as it exceeds all the requirements of the project including satisfying 'THE SIX PROBLEMS'! For Fort Vancouver this alignment was conceptually drawn to show how freeway structures might best be shaped and placed to better serve Fort Vancouver. Here are highlights of this C-D Straight Alignment with respect to Fort Vancouver:

- 150,000 square feet of additional land becomes available within the site of the historic village
- 1,000 feet width of open ground level expanse exists between the lower park and Vancouver city streets allowing visual connection between the early platted city, village and fort
- Third Avenue extending between the fort and city street grid allows pedestrians and vehicles to move between the city, park and river
- Elevated freeway columns, as many as 70, can be sculpted, ideally by an artist, to recall the historic forest that was the western edge of the Hudson Bay Fort and trading village
- The LRT Station is placed a short three block walk from the lower park. This walk is through the 'forest' of I-5 columns suggesting an interpretive presentation of the historic context that was the area during the early HBC period. This recalls that time when the forest was the western edge of the HBC settlement

P-029-001

- Views through the I-5 column 'forest' visually link lower Vancouver, the Columbia River and hills in the distance. Views would also include a much more attractive bridge that is more easily achieved with a straight aligned bridge.

These ideas are represented in the following sketch:



Figure 1

Conceptual plan showing ground level open space between the park and river. Note that this plan is indicative of a longer term future in which the berm of the BNSF track-bed is placed on a bridge structure allowing people to pass under the railroad tracks. Dots are columns indicative of what might be expected with the elevated freeway.

This plan would be indicative of the period that transitions the HBC to the formalized street grid of the City of Vancouver. These periods are represented with the following plans from the Fort Vancouver web site:



P-029-001

Figure 2

Hudson Bay Period. The western edge of the settlement was a forest during this period. This suggests that the park had a close visual relationship with the Columbia River looking to the south. The western edge was a close in forest with grass lands and farming to the east.



P-029-001

Figure 3

The period of US Fort Vancouver and Vancouver Barracks. Notice that the western edge of Fort Vancouver has the City of Vancouver platted as we see today. This period was the formalization of the fort as the urban center on the north shore of the Columbia River. Civic life was the synergy between the fort, village and early city during this period. The forest was removed and urban life spread downstream along the shore of the Columbia River.

These ideas suggest one possible strategy to shape freeway and bridge structures to better Fort Vancouver. However, these are but a few notions that represent responsive design. It is fair to assume that the actual design, yet to occur, will evolve to be much better as creative, skilled, experienced architects, artist and engineers are employed.

A bit more detail

Clearly choices are possible. The downstream alignment proposed by the CRC project office might best be described as the worst possible alignment that, if compared with the C-D Straight Alignment, proves that the C-D Straight Alignment is not the only possible layout and alignment that satisfies the needs for alternative 3 – bridge replacement and LRT. Why is this important? The C-D Straight Alignment solves the six problems and has contextual advantage. The reasoning is that to limit the project to only one possible alignment and layout during EIS discovery is to put the project at risk. This is what is happening now as the CRC project insists the curved downstream alignment is the only possible solution.

P-029-001 An overview comparison of the two ideas is striking. The following images share these contrasts:

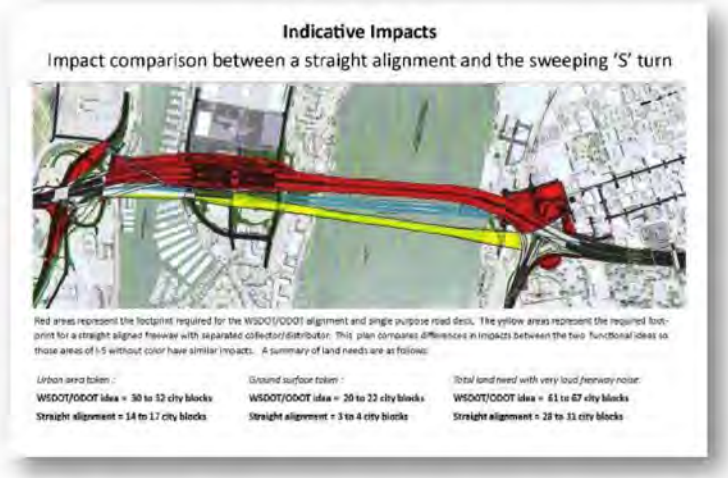
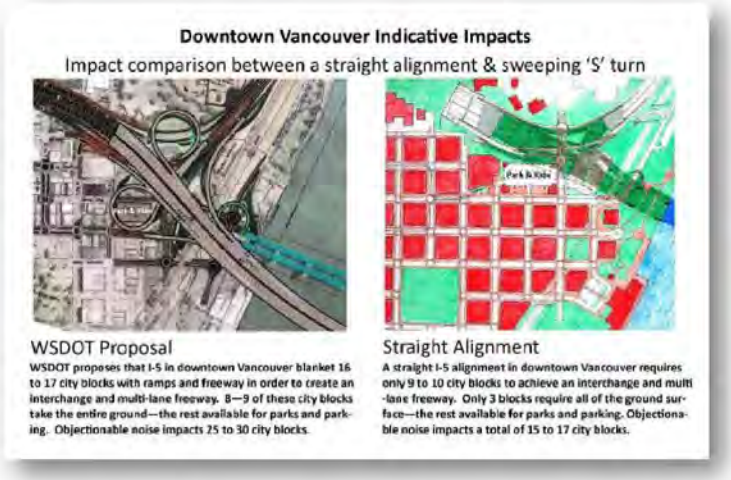


Figure 4
Comparison of CRC downstream alignment with the C-D upstream straight alignment. This is an overall sketch to share the comparative footprint of the C-D Straight Alignment with the CRC curved downstream alignment. Red areas represent land that will be required if the CRC curved downstream alignment is use that is not needed if the C-D Straight Alignment is selected. Yellow is land needed for the C-D Straight Alignment that is not required if the CRC curved downstream alignment is selected. The blue lines are the existing twin I-5 steel truss bridges.



P-029-001

Figure 5

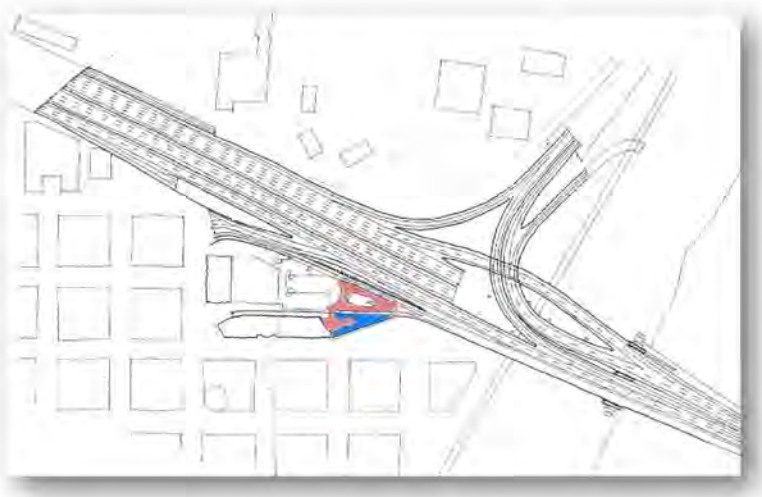
Side comparison of CRC downstream curved alignment (left) with the C-D straight alignment (right). Please note that the plan on the left shows the elevated freeway while the plan on the right shows the ground level with the elevated freeway shadow shown in dark green.

P-029-001 The following two sketches are better images of the layout possible for the C-D Straight Alignment near Fort Vancouver:



Figure 6

Surface layout showing indicative pedestrian pathways between the park, lower downtown and Columbia River (light brown color). Yellow city blocks are new city blocks that would not be possible with the proposed CRC downstream alignment.



P-029-001

Figure 7

Elevated I-5 structure for the C-D Straight Alignment. Note tha the LRT station is a triangualr platform associated with a building – possiblly the proposed Pioneer Building. A small roof top pool brings the Columbia River to the elevated platform and a rail crossing connects the platform with the building which might house a museum, art center or civic activities.

Errors, Lies, Law and Hypocrisy

So what does the CRC project office have to say about the C-D Straight Alignment?

When I was forced to use public disclosure laws to determine if the CRC project office has considered the C-D Straight Alignment the response was shallow and confused. Only one document was offered that suggested any sort of review for the idea. This was a simple listing of potential issues associated with a conceptual plan of the SR-14 interchange. From this listing of potential issues the project office declared the idea to be a bad idea. The only problem with this is that these potential problems – geometric alignment issues - are not problems. The conceptual layout provided to the CRC project office more than satisfies ALL WSDOT interchange criteria and provides connections from I-5 to Vancouver that are NOT PROVIDED with the CRC downstream alignment. What is one to make of this action?

P-029-001 Assigning a staff engineer to speculate on potential problems for one interchange and then twisting these potential concerns to declare the entirety of the idea is fatally flawed is hypocrisy when the layout for the interchange is technically correct. So it turns out that the project office leaped to a conclusion based on incorrect internal review actions. But how can this be when the office declares, as Nancy Boyd stated just the other week to the Vancouver Rotary that the project office considers LOTS of alternatives by stating that:

- Through the public process all ideas were thoroughly vetted
- All considered against specific set of criteria

So it turns out that thorough vetting is declaring an idea fatally flawed because a staff engineer speculated on potential geometric concerns for one part of the idea, speculation that was in error, never bothered to share this with the public or the source of the idea and then filed this away to ignore the idea. They also made false witness to the bridge review panel and, as was related to me 'off the record' by members of the BRP, asked the BRP to create a bogus idea that sounded like the C-D Straight Alignment so as to mask the potential viability of the idea. I find it shocking that this obfuscation is declared to be thorough vetting.

Does it follow that the specific set of criteria the CRC project office uses to consider ideas is to speculate on possible problems and, based on this speculation, declare the idea to be bad? This is the story that the public records request told me. My conclusion is that the project office has lied regarding thorough vetting as shown with the meager consideration given to the idea, do not follow-up with the originator of the idea with feedback sharing how they will, or have, review the idea, internally conduct flawed reviews without quality control, are content with self-serving 'memos to the file' and allow others to think that ideas are subjected to thoughtful consideration against a specific set of criteria. It appears to me that the project office simply wanted to find a potential technical issue to declare the idea bad and then bury awareness in the deep recesses of project files.

However, a corrupt organization still must be held accountable to the laws of the land. For Fort Vancouver this is the requirement that the project act on any idea that might lessen the impact on the National Historic Reserve. This is best stated by Frank Green and Casey Liles of the CRC project office:

"An upstream alignment sets the bridge and SR14 interchange ramps closer to the Vancouver National Historic Reserve (the Reserve) at the river's edge and was determined to have greater impacts to this resource. The Reserve is protected by Section 4(f) of the Department of Transportation Act of 1966 which requires identifying prudent and feasible alternatives to avoid impacts to this land and by Section 106 of the National Historic Preservation Act. Under Section 4(f), if some impact to this land is unavoidable, all possible planning to minimize harm from use should be explored. The project has determined that it is not possible to avoid all impacts to the Reserve. Therefore, reasonable and prudent opportunities to minimize impacts shall be implemented. The downstream alignment optimizes reasonable and prudent opportunities to minimize Section 4(f) impacts."

P-029-001

- Statement made by Frank Green, Structures Engineering Manager, and Casey Liles, Highway Engineering Manager, Columbia River Crossing Project Office in an August 15 2011 memo regarding the C-D Straight Alignment.

How is it possible for the CRC project office to make this statement? With the C-D Straight Alignment layout offering clear advantages to the fort this statement can easily lead one to believe the project office is self-serving and quick to make false assumptions. One is reminded to look carefully at the two layouts as this issue must be understood comparing physical layouts –the 'fit for function' of I-5 that best serves the needs of users and neighbors. Also, I do not believe Frank Green or Casey Liles are historians, archeologists, anthropologists or experienced preservationists so it should not be up to them to make such a declarative statement once transportation issues have been found to be criteria compliant for both upstream and downstream opportunities. Until such time as both ideas are subjected to rigorous comparative analysis against criteria that the National Park Service and State Historic Preservation Officer determine is appropriate this statement is only speculation on the part of Frank and Casey.

It has been demonstrated that the C-D Straight Alignment better satisfies mobility needs for the project. The project office has never disputed this. It has also been demonstrated that the C-D Straight Alignment is safer, less expensive and will result in a more beautiful bridge. Again, the project office has never disputed this. It has been demonstrated that the C-D Straight Alignment satisfies mobility requirements, both rubber tire and steel wheel, better than the CRC project office downstream alignment. This has not be disputed by the project office.

With respect to Fort Vancouver the project office appears to be in violation of Section 4(f) of the Department of Transportation Act of 1966 and by Section 106 of the National Historic Preservation Act. This is, of course, unless the project office can put forth technical reasoning why the C-D Straight Alignment is fatally flawed. If the project office were acting in an honest and forthright manner they would presently be consulting with national and state historic preservationists to better understand how the two choices influence the historic site and work out a methodology to better understand what best serves the interest of this important cultural resource.

Based on objective measures of public integrity we appear to have a project office that may elevate Payton Place to a place with greater accountability to the public, stronger civic leadership seeking a better tomorrow and sensitivity to preserving and enhancing the historic place. Without identifying positive and proactive measures to strengthen our communities, to limit one's effort to 'SIX PROBLEMS' is to admit that we only live in a world of problems.

Hines, Maurice

From: Kevin Peterson [petersondesign@centurytel.net]
Sent: Monday, October 24, 2011 8:38 AM
To: Columbia River Crossing
Subject: Alternative 3, bridge replacement transit
Attachments: Letter regarding CRC and the C-D option.docx

Dear Project Sponsor,

Please add the attached paper to feedback on the FEIS for the Columbia River Crossing project.

Thank you,

Kevin Peterson
165 White Point Road
Friday Harbor, WA 98250
206 369 8048

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

P-030-001

Columbia River Crossing

EIS Alternative 3: Bridge Replacement with Rail Transit

Did the Project Office Adequately Evaluate Opportunities?

An alignment and layout that the CRC project office failed to consider

Alternative 3; Bridge Replacement with Transit

The preferred EIS alternative calls for the replacement of the I-5 bridge with an integrated light rail line across the Columbia River into Vancouver. The CRC project office has proposed a layout and alignment for the bridge and the five miles of freeway north and south of the bridge suggesting how this alternative would be accomplished. This solution aligns the freeway on a curved bridge placed downstream of the existing bridge and employees a potpourri of ramp philosophies to cope with too closely spaced interchanges. In 2008 this layout and alignment was declared the only possible solution that satisfied requirements of this EIS alternative.

Most people felt that this solution was expensive, intrusive, impactful and unattractive. The CRC project office has since spent time trying to modify the layout to reduce impacts but has not considered other than ancillary modifications to the concept.

In early 2010 Mr. Kevin Peterson, an architect and planner who specializes in international transportation infrastructure physical design, was asked by architects and landscape architects in Portland if another solution was possible. Mr. Peterson spent the early period of 2010 researching project history and investigating ideas that were not considered by the CRC project office. By early spring Mr. Peterson discovered an alignment and layout that appeared superior to the proposed CRC Curved Alignment.

The C-D Straight Alignment Idea

In the spring of 2010 WSDOT and ODOT was presented with an alignment and layout different from any other alignment and layout previously considered by the CRC project office. This layout proposes:

- A mainline without conflicts between Marine View Drive and Mill Plain Boulevard

P-030-001

Please see responses to Mr. Peterson's other submitted comment letter, P-029.

The LPA was determined to provide the best combination of meeting the Purpose and Need, as well as addressing the other evaluation criteria, as summarized in Chapter 2 of the FEIS. Mr. Peterson's idea was reviewed by the Bridge Expert Review Panel who chose not to recommend that CRC pursue it further. It was also reviewed by the CRC staff. The proposal had significant traffic operations deficiencies and did not hold promise that it could perform as well as the LPA or provide any substantial advantages.

P-030-001

- A separate collector distributor (C-D) roadway interconnecting Marine View Drive, Hayden Island and SR-14/Vancouver independent of the mainline that also acts as an urban arterial crossing the Columbia River and North Portland Harbor.

This option greatly exceeds functional needs for transit and vehicular requirements while having a smaller footprint than today's I-5 freeway. This option exceeds WSDOT Design Manual geometric standards and provides a better way to cope with the unprecedented number of interchanges that are spaced too close to one another in the urban context the freeway is placed.

This option is referred to as the C-D Straight Alignment because I-5 is essentially straight from south of Marine View Drive to north of Mill Plain Boulevard, a distance of almost three miles with the exception that the existing slight curve in the North Portland Harbor bridge is retained.

CRC Project Office knowledge of this option

The CRC project office was presented with this option in the spring of 2010 communicated using conceptual drawings and narrative. This presentation was done in a collegiate briefing in which Mr. Peterson shared the possibility with senior CRC project office staff. Months later it was apparent to Mr. Peterson that the project office had no intent to act on the possibility for they indicated that the material would simply be filed.

Concerned that the project office was not acting in the best interest of the public Mr. Peterson presented the idea to WSDOT headquarters. Mr. Jerry Lenzi, (title? – I think he is in charge of all WSDOT design) met with Mr. Peterson and reviewed the idea, found the idea most compelling, coordinated with the ODOT director and, considerate of the critical time line for the project, requested that the idea be presented to the Bridge Review Panel (BRP) for review. Most curiously he did not appear to follow-up with the CRC project office.

Mr. Peterson presented the idea to the BRP during a formal meeting as this panel was about to start a week long review of the bridge. However, after the idea was presented CRC project staff instructed the BRP not to review the idea. This directive, which I assume based on informal conversations with BRP members, limited review to only the bridge and did not consider fundamental issues like interchanges or the applicability of a collector-distributor. The C-D Straight Alignment was not reviewed, or considered, by the BRP even though the public was led to believe it was reviewed and discredited.

P-030-001

The first review of the C-D Straight Alignment by the CRC project office occurred in October of 2010, almost a half year after the project office was presented with the idea. Unfortunately this review only considered one interchange, SR-14 and I-5, and was subsequently shown to be completely in error. This 'review' simply speculated that geometry might not satisfy WSDOT standards at this interchange and, therefore, was the CRC project office basis to reject the entire C-D Straight Alignment. When Mr. Peterson finally received this review, in the summer of 2011 after having to make a formal records request, was the geometric 'speculation' shown to be completely in error.

It should be noted that if the CRC project office, the BRP, WSDOT or ODOT shared with the public that the BRP did not consider the C-D Straight Alignment Mr. Peterson could have been immediately taken to bring this inaction to the attention of public officials. Also, if Mr. Peterson was informed of the CRC project office October review in a timely manner then the erroneous review would have been pointed out and corrected. As it is the CRC project office only provided this information to Mr. Peterson after a formal records request was made almost a year and a half later! At no time, from the spring of 2010 to the present, has the CRC project office provided Mr. Peterson with any feedback on the C-D Straight alignment or, more importantly, the CRC project office has never acknowledged that this option existed. **This means that the public or project sponsors were never informed that this option existed.**

Specific benefits of the C-D Straight Alignment

The following is a listing of the significant benefits of the C-D Straight alignment contrasted with the CRC project office proposed curved downstream alignment:

1. Capital costs appear to be 300 to 700 million less that the CRC curved alignment

2. One efficient transportation investment serves both interstate and local needs providing the functional benefit of two bridges - an express freeway and urban arterial. One transportation platform – one bridge – satisfies both functions. Connecting Vancouver, Hayden Island and North Portland via an urban arterial provides freight mobility and local movements without entering the high speed freeway traffic environment.

P-030-001

3. The idea requires slightly less land than the existing I-5 freeway. What is proposed in the CRC curved alignment requires taking a million and a half MORE square feet of precious urban or park land!

4. Compared with the CRC curved alignment, 33 to 36 fewer urban city blocks of land are not subjected to the noisy footprint of the freeway unless massive view blocking noise barriers are built.

5. Hayden Island can evolve into a meaningful and great transit friendly pedestrian community of between 35 to 40 contiguous city blocks of parks, mixed-use development and urban uses where many thousands can live and work adjacent to the Columbia River within walking distance of high capacity transit – outside the noisy footprint of the freeway. The proposed CRC curved alignment bisects Hayden Island into two halves separated by a 550' to 700' expansive freeway 'no-man's land'.

6. Vancouver and Fort Vancouver reconnect with each other and the river with park and city streets. The LRT station is a short three city block walk from Fort Vancouver Park. Third Street becomes an important surface connector and gateway to Vancouver and Fort Vancouver Park.

7. Land need in the Fort Vancouver Reserve archeological site of the historic village is +/- 130,000 square feet less than the existing freeway and +/- 150,000 square feet less than what the CRC project office proposes with its downstream alignment. This is with a straight upstream alignment! The Reserve is protected by Section 4(f) of the Department of Transportation Act of 1966 which requires identifying prudent and feasible alternatives to avoid impacts to this land and by Section 106 of the National Historic Preservation Act. Under Section 4(f), if some impact to this land is unavoidable, all possible planning to minimize harm from use should be explored. The C-D Straight Alignment is therefore the only alignment and layout choice that best satisfies federal law.

8. Bridge aesthetics are vastly superior with a single beautiful cable stay bridge likely to be less costly than the two anonymous truss bridges proposed today. Landside freeway aesthetics and landscapes are vastly superior and able to compliment an urban context with architectural treatment. The freeway across Hayden Island becomes a world model for how urban use near a freeway can be viable and attractive.

P-030-001

9. Future transportation functions like commuter rail, high speed rail, additional LRT lines, 'smart' car technologies and additional vehicular capacity are more easily integrated. Capacity increases to 11,000 vehicles per hour per direction is possible with the LRT line or the 'transportation platform' infrastructure investment can be modified to add more high capacity transit including at least one additional rail line like commuter rail. The idea should provide for more than a half century of growth that is not presently considered – a period of time possibly embracing the entire span of this century. This assures today's investment buys a 'transportation platform' having optimal viability a hundred years or more into the future. This allows many future generations a 'transportation platform' that is better able to serve the mobility needs these future users will determine best serves what their needs require.

10. In-water pier disturbances are 12 to 18 piers in the Columbia River plus 11 to 15 piers in North Portland Harbor with the CRC downstream curved alignment for a total of 23 to 33 in-water disturbances. In comparison the C-D straight alignment has 4 to 10 piers in the Columbia River plus 4 piers in North Portland Harbor for a total of 8 to 14 in-water disturbances. Bridge shadows cast on the river is half that of the proposed solution. Environmental impacts are greatly reduced.

11. Conflicts on the mainline are reduced from eleven to four and curves are removed with a reduction in the accident rate on the mainline by +/- 70%. This means that commute period accident caused delay might be expected every other week for the C-D straight alignment contrasted with one or two delays per week with the CRC curved alignment. Twice as many people can be expected to die or be injured on the CRC proposed design.

Two negatives arise from this alignment and layout. These are:

- A change may cause a project delay. It should be noted that if the CRC project office acted in a responsible manner this delay may not have been required.

- The hotel on Hayden Island will place the freeway closer and this may necessitate reconstruction of the west wing of the hotel.

P-030-001

Process Comments

Evaluating alternatives within an EIS process requires consideration of physical layout in order to understand impacts of the idea. This vetting is valuable in two regards. First is that any physical configuration created in the very early 'discovery' of an EIS alternative must assume a reasonably 'worst case' physical consequence in order to be fully confident that the EIS evaluation does not understate impacts. This is important from a regulatory sense as many factors must be weighed and evaluated. For the CRC these regulatory factors include navigational clearances and airport airspace as the bridge and freeway is sandwiched between these 'space envelopes'. For example, the FAA put forward desirable airspace guidance that suggested the airspace is better protected if the bridge structure is lower. The project office then made an assumption as to the glide slope felt appropriate for Pearson Airport. This glide slope assumption made by the project office, as best as I can determine, is a 34:1 slope. Two possibilities exist as to why this glide slope is used. One is that this is the necessary glide slope for a precision ILS approach and the other is that this is the glide slope needed to clear existing terrain. However, the likely, and anticipated, regulatory decision is that currently used by the airport, City of Vancouver and other airports having the similar characteristics. This is a 20:1 glide slope. For this not to be the glide slope will cause the airport to make major changes and preclude the approved waterfront master plan and potentially impact thousands of utility runways throughout the United States. Unfortunately, CRC project documents do not explain why they are using a glide slope other than 20:1.

From this 'worst case' layout comes a much more informed appreciation of actual impacts and regulatory needs that, in turn, open up possibilities and opportunities that could not have been considered earlier. The project failed to 'sit back' and objectively appreciate what was 'discovered' as part of the DEIS process. Instead, the project assumed that they had identified the only reasonable solution for the alignment and layout of the project. This is placing the bridge downstream using a potpourri of interchange ramp techniques to satisfy design criteria and not bothering to seek a better layout or alignment opportunities. What changes have occurred were to mitigate negative aspects of the DEIS layout and alignment consistent with refinements for a project during preliminary design. What Mr. Peterson did was 'sit back' and evaluate project needs with the understanding brought about in DEIS discovery. He was then able to question certain erroneous assumptions and, not biased by earlier prejudice, seek an optimal layout and alignment for EIS Alternative 3: Bridge Replacement with Rail Transit.

When the CRC project office was informed of this layout and alignment they should have immediately subjected the idea to a careful and deliberate review. This could have been

P-030-001

easily accomplished within a month suggesting that the CRC project office should have informed project sponsors that another layout and alignment possibility exists. By mid-summer 2010 the project office could have placed this layout and alignment idea into a parallel conceptual design track that would have allowed the project to switch focus by late fall 2010 if the idea proved to be feasible.

Feasibility

The C-D Straight Alignment has been informally evaluated by a number of transportation planners, bridge engineers and large project managers. These people, all employed by governmental agencies or consultants that work for local, state and federal governments have provided this input to Mr. Peterson confidentially. None of these people have found 'fatal flaw' errors in the idea, all have found the idea to be significantly superior to the CRC curved downstream alignment, all have shared input that might make the idea even better.

CRC Project Office Actions

The CRC project office, and WSDOT senior leaders, all claim that the C-D Straight Alignment idea was carefully considered. These statements are inconsistent with actions taken by the CRC project office if the Public Records Request of August, 2011 included all information pertaining to review of the C-D idea which uncovered the single review action - the October 2010 review of the SR-14 interchange. Note that this review was nothing more that incorrect speculation leading to a false conclusion. As best as can be determined project staff may have discussed the idea, possible at the executive water cooler.

October 4, 2011

Nancy Boyd
Columbia River Crossing
Project Director
700 Washington Street Suite 300
Vancouver, WA 98660

Dear Nancy,

P-031-001

Last week I met with Kevin Peterson. He presented and discussed an alignment for the CRC project that seems very reasonable and creative.

In the meeting Mr. Peterson made the following claims for a straight alignment:

- More than a dozen city blocks in Vancouver and Hayden Island do not need to be taken for the bridge and the land area needed for the bridge and freeway is less than the land occupied by I-5 today; which Mr. Peterson asserts will save 1.5 million square feet of urban land.
- Expensive and massive environmentally disturbing foundations built in the Columbia River and North Portland Harbor is significantly fewer, about half, and environmental impacts, both natural and cultural, are much less.
- Project costs can be significantly reduced – with a half billion dollars saved a reasonable expectation.
- A straight freeway separating fast mainline traffic from merging traffic using a collector-distributor is safer and results in less congestion delay. Mr. Peterson suggests the accident rate may be half that of the curved downstream alignment.
- His idea looks to build neighborhoods near light rail transit (LRT) stations where many thousands of people can live and work within walking distance of stations. Station area communities, where many people can live and work, are important if the LRT investment is to be economically justified.
- Mr. Peterson insists his alignment restores 150,000 square feet of the historic village of Fort Vancouver to National Park Reserve and reconnects the historic park with the Columbia River and original city of Vancouver much like that a hundred years ago. The ability to attract more people to share the cultural resource of Fort Vancouver sounds too good to be true.
- A straight bridge can consider many attractive bridge types that are not possible with a curved alignment – many of which appear to be great icons for the region.

P-031-001

Please see the responses to Mr. Kevin Peterson's letters, P-029 and P-030.

P-031-001 It is my understanding that Mr. Peterson presented this idea to you almost a year and a half ago. What he has shared with me suggests that the CRC did not consider this idea and did little more than ignore this opportunity. He says that only one intersection layout was looked at and this was done incorrectly. I am very concerned that his idea, if a valid one, was not considered in a manner that might have validated its logic – which to me seems very simple and straight forward.

The CRC project office has spent the last six years investigating how to best replace the freeway and bridge. This effort involved many experts, engineers and community representatives. I can only imagine that the ideas put forward by Mr. Peterson must have significant problems that keep it from consideration.

Attached is a six page summary of this issue prepared by Mr. Peterson. Please let me know what is incorrect with Mr. Peterson's summary. Since this issue involves public trust and transparency a quick response is very important to me. Controversy has been part of this project for years so please provide a critique of Mr. Peterson's idea in a form that I can share with my constituents.

I'd appreciate this information by October 18, 2011. If this is not possible please let me know why.

I look forward to your prompt response,



Ann Rivers

P-031-001

Columbia River Crossing
Alternative 3 – Replacement Bridge with LRT
Physical Alignment and Layout - The CRC Project Office has this Wrong.

The Columbia River Crossing Project is more than a bridge. This multi-billion dollar project reorganizes five miles of freeway within a fragile urban context desperate for revitalization and allows the Portland LRT network to reach Vancouver. What is proposed today is little more than a single purpose complicated freeway maze barely able to meet 2030 needs with light rail attached – hardly the sort of progressive thinking we seek from a two hundred year investment!

Without question this investment must meet LRT and roadway standards of today – this is not in question. It then follows that improving the urban context and environment are relevant measures that should define what we do. Let's consider five valuable characteristics of this fragile urban context that project sponsors appear not to have adequately considered or have failed to achieve:

1. **Vancouver and Hayden Island Urban Viability**. These places are the only urban centers on the shore of the Columbia River within the expansive Portland metropolitan area. Present urban use is stunted due to the intrusiveness of I-5. To evolve viable urban use requires reasonably quiet and attractive city landscapes. **The proposed freeway fails these measures as it takes an additional 1.5 million square feet from this fragile context.**
2. **Transit Optimization**. Transit effectiveness works hand-in-glove with density, transit oriented redevelopment and easy community connections. Urban areas should be redeveloped near Hayden Island and Vancouver light rail stations as urban places where many thousands live, work and enjoy. **The proposed layout does little more than comingle stations with freeway ramps and noise.**
3. **Inequity of passage.** The eighty mile stretch of the Columbia River between Kelso and The Bridge of the Gods can only be crossed using two fast freeways. This means all urban traffic and freight mobility must cope with freeway restrictions, essentially an inequity of passage for those impeded or intimidated by fast moving freeway traffic. **This urban crossing should ease this impediment; not exacerbate the problem by comingling this slower traffic onto a very wide freeway deck.**
4. **Better than what is being replaced**. The replacement freeway should be superior to what is being replaced measured in environmental benefit and design efficiency. This means a smaller over-water footprint; fewer in-water disturbances and less land need than currently needed by I-5. Bigger is not necessarily better. Our goal should be optimizing capacity with efficient infrastructure. The measure should be the relative size of the improvement with the existing freeway. **Sadly, what is proposed is more massive, intrusive and has a large negative environmental impact.**
5. **Regional pride**. The engineering solution should be a source of regional pride valued for engineering excellence, aesthetics and environmental sensitivity. **The proposed design is forced to be anonymous due to its complicated alignment and massive ramps and will not be a source of regional pride.**

P-031-001

After the CRC project office had sorted out planning and operational choices and constraints civic leaders were presented with only one basic functional layout – just one engineering 'fit for function' design offered nearly three years ago. This is the two anonymous curved deck truss bridges and massive land hungry freeway interchanges we see today – slightly modified as one would expect doing preliminary design. Project sponsors have only added to project complexity as they are forced to manipulate this singular solution in an attempt to overcome negative aspects and public feedback. These efforts have resulted in decoration and hope that this allows community buy-in and stops debate.

Why have we not seen ideas put forward that better consider the needs of the urban setting? I believe the answer to be shocking in its simplicity – urban measures were always considered secondary and timidly addressed, often as a mitigation measure or dutiful documentation of the planning process. The project office only considers the following attributes to be appropriate for this urban freeway:

Growing travel demand and congestion
Impaired freight movement
Limited public transportation operation, connectivity, and reliability
Safety and vulnerability to incidents
Substandard bicycle and pedestrian facilities
Seismic vulnerability

These may be appropriate when contrasting 'no build' with 'tunnels' but are woefully inadequate measures to design an urban freeway and major bridge – sadly these are the measures the state is using to decide on alignments and layouts so when engineers found one solution that was used to support environmental documentation they stopped planning and proceeded into the design of this 'fit for function'.

Observing this unhappy situation one is compelled to ask what option and opportunities might have been overlooked. Two important constraints need to be observed if the preferred alternative of bridge replacement with LRT is to support the environmental understanding we now have. These are:

1. Any idea must meet or exceed the functional needs identified for the project.
2. Any idea must be kept within the Primary Area of Potential Impact used as part of the environmental analysis of the project. To be outside this boundary would cause certain aspects of the environmental work to be revised.

Let's consider important discoveries from this inquiry.

Project planners propose a freeway of between five and eight traffic lanes in each direction accessed by short collector-distributors, auxiliary lanes, braided ramps and, occasionally, normal ramps. This solution is needed to cope with interchanges spaced too close together, a river and harbor to be bridged, and the sweeping 'S' turn freeway geometry. Within the core area of this freeway only three mainline lanes are needed in each direction if interchange traffic does not merge. What might happen if

P-031-001 local traffic – movements within this dense fabric of interchanges and bridges - were accommodated on a separate collector-distributor 'bridge', operating as an urban arterial, that joins with I-5 to the north and south of this unprecedented interchange density? This idea means that shore-to-shore movements do not comingle with fast interstate traffic and huge complicated freeway interchanges can be replaced with simple intersections. This 'collector/distributor', or C-D, this idea is frequently used when freeways are placed in dense complicated urban settings. If the C-D were to operate for the benefit of local shore-to-shore movements then it might best be considered as an arterial. Placing this 'urban arterial' C-D function underneath fast moving interstate traffic requires one six lane wide bridge that greatly reducing the freeway footprint.

Is it possible to even consider this idea? The WSDOT Design Manual clearly states that a C-D or grade separated (braided) ramps are the two options open to designers when interchanges are spaced closer than one mile:

> The minimum spacing between adjacent interchanges is 1 mile in urban areas, 3 miles on the Interstate in rural areas, and 2 miles on non-Interstate in rural areas (see Exhibit 1360-2). In urban areas, spacing less than 1 mile may be used with C-D roads or grade-separated (braided) ramps. Interchange spacing is measured along the freeway centerline between the centerlines of the crossroads.

Since the C-D idea was not considered by the project office it is a worthy idea to consider. But first let's see what might be done to take the back-to-back 'S' curves out of the freeway as this will reduce accidents and open up many bridge types for possible use. For freeways and bridges to be straight is a very, very good thing!

I-5 must fit above the navigation channel of the river, pass over the BNSF railroad and stay below the glide slope into historic Pearson Airport. A series of crucial alignment and roadway geometric decisions were required to fit the bridge and freeway into the resultant available vertical space. Although project sponsors wanted a straight alignment and bridge, the glide slope issue was considered a 'fatal flaw' that forced the bridge downstream which necessitated the undesirable sweeping 'S' turn freeway geometry we are now asked to accept. This also resulted in the complicated maze of interchange ramps in the project. Investigation discovered that the CRC project office was using incorrect glide slope criteria that unnecessarily influenced freeway placement. For Pearson Airport the City of Vancouver, Pearson Airport and the FAA require and apply a 20h:1v glide slope for obstacle clearances, a slope proven to be safe at thousands of similar runways. The CRC office was using an unusually flat 34h:1v glide slope. If the correct glide slope were to be applied a single bridge fits on a straight alignment from Mill Plain to the south edge of Hayden Island eliminating the need for multiple sweeping 'S' turns.

Most collector-distributors are placed to the outside of the mainline. Why not place the C-D under the mainline? This action reduces the footprint to less than the existing I-5 freeway occupies today! This reduced land need recovers 150,000 square feet of the historic village in Fort Vancouver presently overlaid with freeway ramps. The proposed downstream interchange geometry at Fort Vancouver requires more land within the park than I-5 currently takes.

P-031-001 Historic Fort Vancouver Reserve is protected by Section 4(f) of the Department of Transportation Act of 1966 which requires identifying prudent and feasible alternatives to avoid impacts to this land and by Section 106 of the National Historic Preservation Act. Under Section 4(f), if some impact to this land is unavoidable, all possible planning to minimize harm from use should be explored. Clearly, it is best to simply avoid impacts. It's also the law to avoid impacts if a layout accomplishes this requirement!

A year and a half ago the CRC project office was presented with this idea – which is referred to as the C-D straight alignment. Here are attributes of this idea measured against the current scheme proposed by the CRC project office (CRC curved alignment):

- Capital costs appear to be 400 to 800 million less that the CRC curved alignment
- One efficient transportation investment serves both interstate and local needs providing the functional benefit of two bridges - an express freeway and urban arterial. One transportation platform – one bridge – satisfies both functions.
- The idea requires slightly less land than the existing I-5 freeway. What is proposed in the CRC curved alignment requires over a million and a half MORE square feet!
- Compared with the CRC curved alignment, 33 to 36 fewer urban city blocks of land are not subjected to the noisy footprint of the freeway unless massive view blocking noise barriers are built.
- Hayden Island can evolve into a meaningful and great transit friendly pedestrian community of between 35 to 40 contiguous city blocks of parks, mixed-use development and urban uses where many thousands can live and work adjacent to the Columbia River within walking distance of high capacity transit – outside the noisy footprint of the freeway. The proposed CRC curved alignment bisects Hayden Island into two halves separated by a 550' to 700' expansive freeway 'no-man's land'.
- Vancouver and Fort Vancouver reconnect with each other and the river with park and city streets. The LRT station is a short three city block walk from Fort Vancouver Park. Third Street becomes an important surface connector and gateway to Vancouver and Fort Vancouver Park.
- Land need in Fort Vancouver is less than the existing freeway and less than what the CRC project office proposes with its downstream alignment. This is with a straight upstream alignment! This also is the only alignment and layout choice that meets federal law.
- Bridge aesthetics are vastly superior with a single beautiful cable stay bridge likely to be less costly than the two anonymous truss bridges proposed today. Landside freeway aesthetics and landscapes are vastly superior and able to compliment an urban context with architectural treatment. The freeway across Hayden Island becomes a world model for how urban use near a freeway can be viable and attractive.
- Future transportation functions like commuter rail, high speed rail, additional LRT lines, 'smart' car technologies and additional vehicular capacity are more easily integrated. Capacity increases to 11,000 vehicles per hour per direction is possible with the LRT line or the 'transportation platform' infrastructure investment can be modified to add more high

P-031-001

capacity transit including at least one additional rail line like commuter rail. The idea should provide for more than a half century of growth that is not presently considered – a period of time possibly embracing the entire span of this century. This assures today's investment buys a 'transportation platform' having optimal viability a hundred years or more into the future. This allows many future generations a 'transportation platform' that is better able to serve the mobility needs these future users will determine best serves what their needs require.

- In-water pier disturbances are 12 to 18 piers in the Columbia River plus 11 to 15 piers in North Portland Harbor with the CRC downstream curved alignment for a total of 23 to 33 in-water disturbances. The C-D straight alignment has 4 to 10 piers in the Columbia River plus 4 piers in North Portland Harbor for a total of 8 to 14 in-water disturbances. Bridge shadows cast on the river is half that of the proposed solution. Environmental impacts are greatly reduced.
- Conflicts on the mainline are reduced from eleven to four and curves are removed with a reduction in the accident rate on the mainline by +/- 70%. This means that commute period accident caused delay might be expected every other week for the C-D straight alignment contrasted with one or two delays per week with the CRC curved alignment.

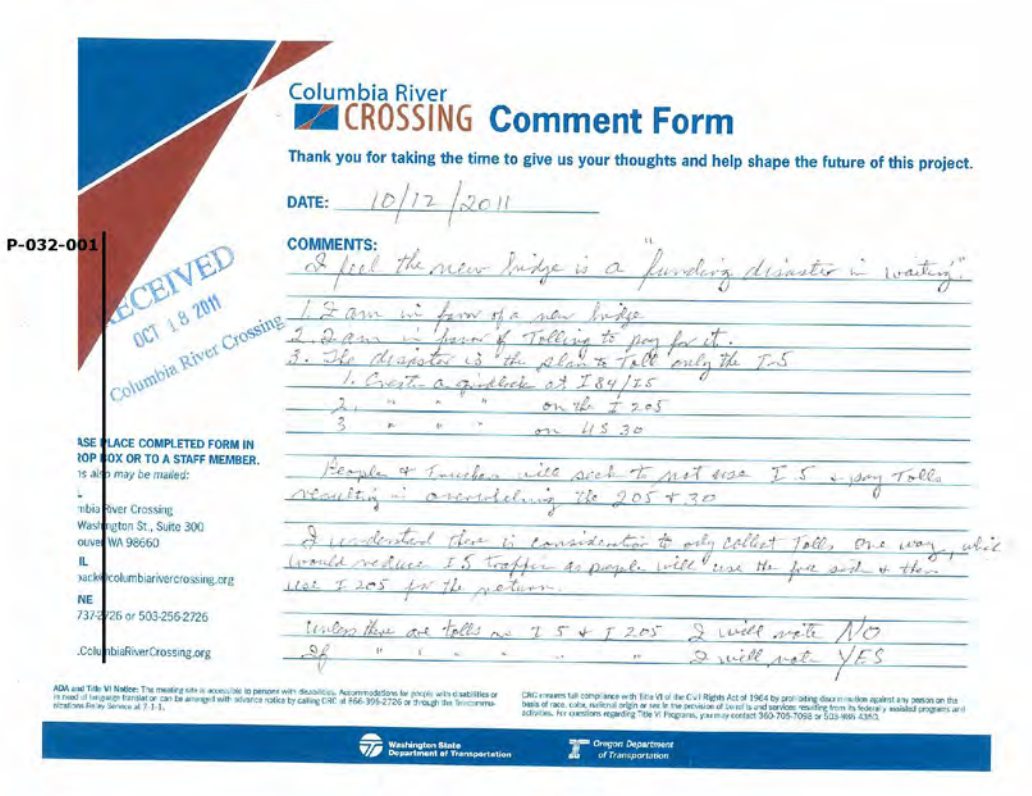
These advantages are comparatively huge!

During the past year and a half Oregon and Washington Departments of Transportation have shunned this potential opportunity. This makes no sense knowing the current proposed layout forever relegates Hayden Island and lower Vancouver to permanent second class urban status for communities served by LRT. No small wonder many people north of the river view LRT as a waste of money.

Sadly, WSDOT or ODOT have steadfastly avoided consideration of the idea. Local leaders and WSDOT management did ask bridge engineers of the Bridge Review Panel to consider the idea only to be instructed by CRC staff not to consider the idea. However, the CRC project office did take one cursory look at the geometry of one interchange for the C-D idea. This 'review' speculated at possible concerns and concluded the idea was flawed. This 'review' has since been shown to be wrong. All of the speculative concerns raised were wrong or inappropriate; all conclusions reached were in error.

Discounting design refinement typical in preliminary and final design, the project office continues to maintain that only one possible freeway layout and one alignment meet the needs of the preferred alternative. This is not the case as proven by the C-D straight alignment and layout. Knowing and ignoring this alignment and layout; the project office is now proceeding with a design that is wrong. The project office continues to spend tens of millions of tax dollars that will result in burdening taxpayers with a billion dollars in payments needed to fund 500 million dollars of concrete and steel that is not needed. The project office continues to violate Section 4(f) of the Department of Transportation Act of 1966. The project office fails to consider alignments and layouts that better serve project needs discovered by environmental work.

P-031-001 The project office is placing this project at risk simply because staff prematurely thought only one alignment and layout satisfied EIS Alternative 3!



Columbia River
CROSSING Comment Form

Thank you for taking the time to give us your thoughts and help shape the future of this project.

DATE: 10/12/2011

P-032-001

COMMENTS:

I feel the new bridge is a funding disaster in waiting.

1. I am in favor of a new bridge
2. I am in favor of Tolling to pay for it.
3. The disaster is the plan to Toll only the I-5
   1. Create a gridlock at I84/I5
   2. " " " on the I 205
   3. " " " on US 30

People & Truckers will seek to not use I 5 + pay Tolls resulting in overwhelming the 205 + 30

I understand there is consideration to only collect Tolls, one way, which would reduce I5 traffic as people will use the free exit + then use I 205 for the return.

If Tolls are Tolls on I 5 + I 205 I will vote NO
If " " " " " I will vote YES

ASE PLACE COMPLETED FORM IN
OP BOX OR TO A STAFF MEMBER.
is also may be mailed:

mbia River Crossing
Washington St., Suite 300
ouver, WA 98660

IL
acket@columbiarivercrossing.org

NE
737-2726 or 503-256-2726

.ColumbiaRiverCrossing.org

Columbia River Crossing
OCT 18 2011
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ADA and Title VI Notice: The meeting site is accessible to persons with disabilities. Accommodations for people with disabilities or in need of language translation can be arranged with advance notice by calling CRC at 866-396-2726 or through the Telecommunications Relay Service at 7-1-1.

CRC ensures full compliance with Title VI of the Civil Rights Act of 1964 by prohibiting discrimination against any person on the basis of race, color, national origin or sex in the provision of benefits and services resulting from its federally assisted programs and activities. For questions regarding Title VI Programs, you may contact 360-705-7098 or 503-986-4350.

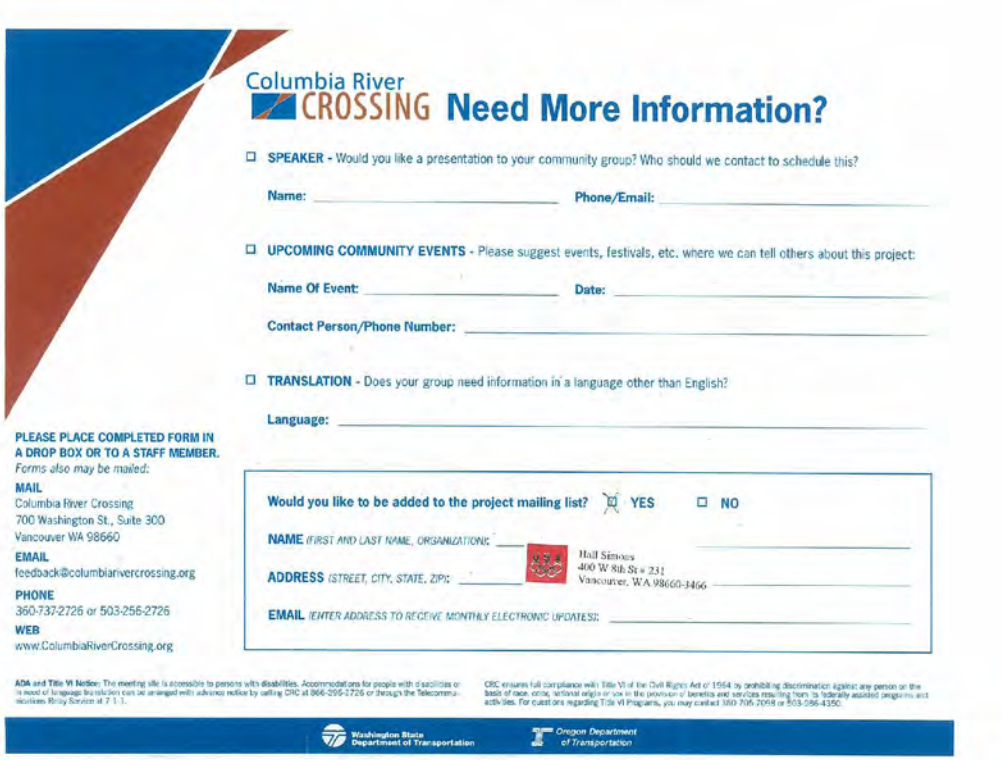
Washington State Department of Transportation
Oregon Department of Transportation

P-032-001

Under existing conditions, trips already divert to I-205 and would continue to do so under the No-Build Alternative because of the unreliability of, and congestion in, the I-5 corridor. With the CRC improvements to I-5, many of those diverted trips would shift to I-5 because it would be a shorter and more reliable trip than I-205. Tolling the I-5 crossing causes some additional trips to shift to I-205 in order to avoid the toll. The net difference in the number of trips crossing on I-205 is only slightly higher with the CRC project than without it.

With few exceptions, federal statutes do not permit tolling of an existing interstate highway without associated improvements. FHWA does have pilot programs that allow state departments of transportation to apply for the approval to toll a facility. The project sponsors are not proposing to toll the I-205 crossing as part of the CRC project. It is possible that a toll could be placed on the I-205 crossing in the future, separate from the CRC project. Section 3.1 of the DEIS and FEIS discuss the effects of the project on traffic levels in the I-5 and I-205 corridors.

In addition, tolling prior to or during construction can be used to manage demand and begin collecting the revenue. This is not currently proposed but could be implemented if approved.



Columbia River CROSSING

Need More Information?

☐ **SPEAKER** - Would you like a presentation to your community group? Who should we contact to schedule this?

Name: _____ **Phone/Email:** _____

☐ **UPCOMING COMMUNITY EVENTS** - Please suggest events, festivals, etc. where we can tell others about this project:

Name Of Event: _____ **Date:** _____

Contact Person/Phone Number: _____

☐ **TRANSLATION** - Does your group need information in a language other than English?

Language: _____

PLEASE PLACE COMPLETED FORM IN A DROP BOX OR TO A STAFF MEMBER.
Forms also may be mailed:

MAIL
Columbia River Crossing
700 Washington St., Suite 300
Vancouver WA 98660

EMAIL
feedback@columbiarivercrossing.org

PHONE
360-737-2726 or 503-256-2726

WEB
www.ColumbiaRiverCrossing.org

Would you like to be added to the project mailing list? ☒ **YES** ☐ **NO**

NAME *(FIRST AND LAST NAME, ORGANIZATION):* _____

ADDRESS *(STREET, CITY, STATE, ZIP):* _____ Hall Simons 400 W 8th St # 231 Vancouver, WA 98660-3466

EMAIL *(ENTER ADDRESS TO RECEIVE MONTHLY ELECTRONIC UPDATES):* _____

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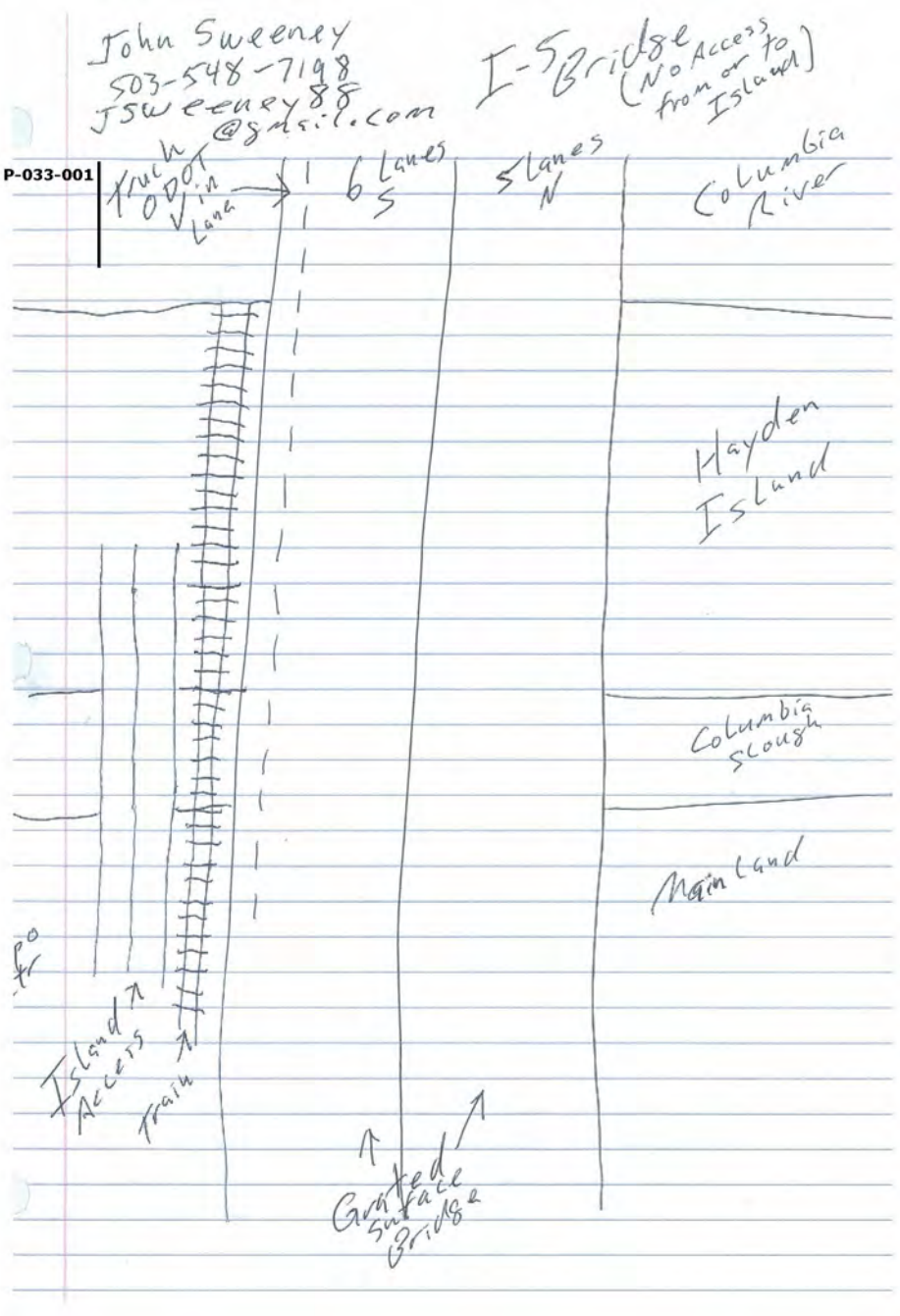
Washington State Department of Transportation | Oregon Department of Transportation



P-033-001

It appears that Mr. Sweeney is suggesting the only access to Hayden Island be via a new local bridge and that there be no I-5 access to or from Hayden Island. A similar concept was considered and rejected in the alternatives evaluation and screening process, summarized in Chapter 2 of the FEIS.

Hines, Maurice

From: lwarberg@comcast.net
Sent: Friday, September 23, 2011 5:38 PM
To: Columbia River Crossing
Subject: Comment from CRC Submit Comments Page

Categories: Orange Category

From: Louise Warberg
E-Mail: lwarberg@comcast.net
Comment or Question:

P-034-001

I'm so disappointed in the final design of the bridge. I know it's inappropriate and fruitless to say this now, but I've been saying it all along...please give us a beautiful bridge. I appreciate the effort and hard work that went into it but I'm very unhappy about the end result.

The cable-stayed design is so much grander and, relatively speaking, not much more costly. I believe the final design doesn't do justice to a major I-5 river crossing. Have you ever heard anyone say how beautiful the I-205 bridge is? I don't believe it's ugly but I do think the new I-5 design is. I wonder what future generations will think of us being so short-sighted. I suppose people will blame it on the Great Recession, but I think that's a cop-out. I really believe a wonderful design was possible.

Louise Warberg

P-034-001

The cable-stayed bridge type was carefully considered. Please see the discussion of the rationale for the composite deck truss bridge type over the cable-stayed bridge type, in Chapter 2 of the FEIS.

Hines, Maurice

From: George W [gw4cw@aol.com]
Sent: Wednesday, September 28, 2011 9:08 PM
To: Columbia River Crossing
Subject: Fwd: A Bridge

Categories: Orange Category

P-035-001

Lets get the CRC bridge buit. You have spent enough time and money in planning for this bridge. If anybody is profiting by not starting construction, it will be found out and prosecut*ion* should be swift.

The following link is why the Chinese are dominating the global economy. They are doers' not talkers as so many Americans are.

There should be a moratorium placed on all new Oregon and Washington State Hwy. construction projects that have not yet been started and shall not be started until the CRC Bridge has commenced.

World's longest sea bridge opens to traffic

Click next line

That is a bridge too far: World's longest sea bridge opens to traffic in China... but it will only hold the title for five ye.ars

Sincerely,

George Wilhelm
1414 SE 97th Ave
Vancouver, WA 98664

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

1

P-035-001

The CRC project's Record of Decision, issued in December 2011, was achieved in roughly six years from the beginning of the NEPA and alternative selection process. This is comparatively quick for a large multi-agency project in the United States. The process has included robust public involvement and refinement of many design options.

Response to Columbia River Crossing's Final Environmental Impact Statement documents
10/20/11 to Heather Willis and the CRC Design team

As a Vancouver-Portland commuter for more that twelve years, I am offering my observations to challenge some of your assumptions regarding future traffic and light-rail along the I-5corridor. I also have a couple recommendations to better utilize public funds and scale down the project in light of the current economic state, and help you create a product that will be most useful to area residents.

P-036-001

1. In section 2.6.2 the report stated: "light-rail is quicker … than rapid transit." The Portland's EXPO center yellow line is slower now than the C-Tran's express bus by about ten minutes. Also in the Vancouver area, the proposed light-rail path will not go near where most people live, so they would have to either drive or take the bus to connect to it. The time to transfer and wait would be five to ten minutes, depending on coordination between the transit modes.

2. When the EXPO center light-rail was built, only a small percentage of express bus commuters switched to that, even though riding it was cheaper. What makes you think that most people would prefer this method even if you did cut five minutes out of the total commute time by extending the rail to Vancouver? It would still be slower than the express bus.

3. One faulty assumption in the design is the length of rush-hour for transit. It is not the same as the congestion of cars on I-5. The car and freight traffic will stagger to try to avoid most congested times, whereas daily transit commuters would not vary their work hours to try to avoid congestion. I believe that the past is a predictor of the future, and according to my observation, the rush-hour times in Portland have not changed from three hours twice/day over the last twelve years. Neither has C-Tran extended their express bus schedule, in fact, it was shortened by 45 minutes each way the past few years. Thus I would expect the transit peak hours to remain six hours per day total indefinitely.

P-036-002

4. The CRC is counting on rerouting about ten percent of the crossing traffic to light-rail. To allow 6,000 commuters to fit into the trains over the three-hour peak period would mean 250 people per train (trains eight times an hour). The trains have to be short due to short blocks in downtown Portland, and the average current train style seats 100 people to a train. If people have to stand most of the time, they will quit taking the train and go back to driving. Also it is not possible to increase train frequency, since so many other trains will converge onto the same bridge and streets in Portland. Off-peak hours, the train may be used for recreational, doctor and shopping trips to avoid paying the toll. Even then to keep it running every fifteen minutes may be too much.

P-036-003

5. The report also stated that light-rail overall is cheaper than rapid transit. It would hold true if there was not the need for both. The cost of light-rail for 2,000 to 3,000 possible commuters would not be very cost-effective. If 70% of commuters prefer to get there faster -by bus- than cheaper –by train-, it would make more sense to invest money into the rapid transit to ensure busses can better keep their schedules. Also this rapid transit lane could be used by long-distance freight. It would be very beneficial to the businesses to get the freight through faster regardless the time of day.

P-036-001

It should be noted that even with the light rail extension, many C-TRAN express routes are expected to continue service between Clark County and Portland. Information on which bus routes would be truncated in Vancouver can be found in Section 2.2.2 of the FEIS.

As congestion increases on the corridor, bus routes that share general purpose traffic lanes would face increased travel time. Because light rail transit has its own guideway, it will offer more consistent travel and will not be subject to traffic congestion in the corridor. Modeling indicates that light rail would offer a time savings compared to buses in the design year of 2030.

Freight traffic will try to avoid the most congested periods. However, it is predicted that overall traffic volumes will continue to rise. The increase in traffic volume on I-5 means that more people are using the corridor than the capacity of the highway can serve. This excess traffic volume must be accommodated either by extending the peak traffic hours (and associated congestion), or by transferring to other routes or modes.

P-036-002

It is hoped that, much like in Portland during peak periods, the light rail system will be heavily utilized in Vancouver. A train with 250 passengers is well utilized, but still has remaining capacity. Considerable attention has been paid to the capacity of the trains, stations, and park and rides. There are industry standards that have been applied. There has also been considerable outreach to the public in order to understand what conditions would be most desired.

System modifications will enable more trains to travel through Portland to accommodate the expanded system. The improvements to the Steel Bridge, which are described in the FEIS, are an example of such improvements. The project will modify system components on the Steel

P-036-004

6. To have three parking lots or structures for light-rail commuters in Vancouver seems excessive. If the expected peak ridership drops from 6,000 to 2,400, perhaps 1,000 people would need parking throughout the day. What makes you think that the commuters from Vancouver would give up their cars and ride the train to work? Congestion is not so bad that they would do that. Maybe 20% of the current drivers to downtown would do that to avoid paying the toll, but only if they are assured parking availability downtown, or if taking the connector bus is convenient.

7. Also I did not find anywhere in the report how you keep other people, like college students, from parking in the Vancouver park-ride facilities. Will you charge for parking to keep them out? The cost of parking should be less than double the toll to keep the incentive to hop on the train. Would $3 per day charge for parking be enough deterrent to keep non-train riders out? The average parking charge anywhere downtown is $5 or more per day. Also could the revenue from parking be offset against what is being charged for tolls?

P-036-005

8. Most commuters do not have downtown as their destination. To transfer to the connecting trains would take too long for most people to be convenient way to get to work. It appears the extensive TRI-MET light-rail network won't be used much by light-rail riders from Vancouver, unless their destination is the Lloyd Center area.

P-036-006

9. It seems the traffic model used to predict future congestion is overly aggressive and does not match the past rates. The northbound HOV lane has stayed at 3 hours since they opened it. The congestion thus has remained at about six hours per day for the past ten years or so, and would not increase to 15 hours in twenty years. Please adjust your model to scale down the project to better represent the future need.

P-036-007

10. The CRC project should be phased according to need and availability of funds. The bridge and its on- and off-ramps are the most important, given the earthquake-risk and need for lifting of the current bridge. Then the bottlenecks southbound at downtown Portland exits and I-84 interchange need fixed to prevent backups north. The northbound I-5 needs smoother transitions from the Fremont Bridge and the Delta park/Marine Drive entrances. Then the other interchanges may be phased in as money becomes available.

P-036-008

In conclusion, I would highlight the need to scale down your traffic model of congestion, the light-rail usage predictions and the need for parking in downtown Vancouver. I would also like to see you create a separate lane for express-bus/freight combination for improved travel times for majority of users. Also phasing the project according to need and availability of funds makes sense. I would appreciate if my insight and suggestions would be taken to heart and considered in the planning and final design of this project.

Sincerely,

Helena Abernathy
21512 NE 373rd St.
Yacolt, WA 98675

Bridge to enable slightly higher speeds, which will improve the network functionality and allow for more trains from Vancouver.

P-036-003

As illustrated in the FEIS, and summarized in the Executive Summary, light rail would better serve transit riders than bus rapid transit (BRT) within the CRC project area because it:

- Would carry more passengers across the river during the PM peak
- Result in more people choosing to take transit
- Have faster travel times through the project area
- Result in fewer potential noise impacts
- Would have lower costs per incremental rider than BRT

Additionally, light rail is more likely to attract desirable development on Hayden Island and in downtown Vancouver, which is consistent with local land use plans.

Allowing freight to use the exclusive bus rapid transit lane would add additional traffic to that lane further increasing the bus rapid transit travel time.

P-036-004

Both current and future land use is one of the criteria used to determine the locations of proposed transit facilities and park and rides. Other considerations include traffic impacts, property impacts, and overall transit operations. The five proposed stations will support current and planned residential and commercial development and related services. As an example, the Clark College terminus station will serve a community and senior center, a community college, and the Veterans Administration campus.

These specific stations and park and rides, with their proposed parking capacities, are tested as part of therigorous analysis completed to satisfy the requirements of the Federal Transit Administration. The FTA and the local agencies have decades of experience in estimating ridership and facility demand. Their projections are validated through years of such studies, and calibrating the projection methods and models with data from completed projects.

P-036-005

There are many transit trips that would not be directly served by the proposed light rail transit extension. However, the transit ridership forecasts indicate that there is a very large demand for this service and that a significant number of passengers would ride the proposed light rail extension. The transit ridership forecasts are based on extensive information about the projected origins and destinations of commuters and other travelers, as well as information on the transportation system and performance. The actual ridership projections and discussion are in Section 3.1 of the FEIS.

P-036-006

By 2030, the region's population is expected to increase by one million people. This increase will result in more people needing to travel between home, work, school, recreation, etc. In 2005, 135,000 vehicles crossed the Columbia River on the Interstate Bridge, which led to 4-6 hours of congestion each weekday. By 2030, 184,000 are predicted to cross the river, which would lead to 15 hours of daily congestion if no action is taken.

Congestion occurs when vehicle demand is greater than a transportation system's capacity. It results in slower speeds and increased travel times. CRC defines congestion as vehicles traveling less than 30 mph. The Columbia River Crossing project uses information gathered from Metro's nationally-recognized travel demand models to determine the project's

effect on congestion. These models predict trip frequency, types or modes of transportation, destination, and time of day. Transportation planners use these models to analyze the effects of such factors as increased population and employment, transportation improvements, and new developments on the transportation system.

Based on the Metro model's past ability to predict transportation effects, the CRC project is confident in the data received from Metro and uses it to determine what impact the project will have on congestion. The improvements proposed by the project to the highway and seven interchanges will help better accommodate increased future vehicle traffic. New auxiliary lanes and longer on/off ramps will allow safer and more efficient merging and weaving to enter or exit the freeway. Narrow lanes and shoulders will be widened to current standards. Shoulders will be added where they are currently missing. All of these changes will improve the flow of traffic in the bottleneck area of the Interstate Bridge.

P-036-007

The evaluation of the five alternatives in the DEIS was preceded by an extensive evaluation and screening of a wide array of possible solutions to the CRC project's Purpose and Need statement. Chapter 2 of the DEIS (Section 2.5) explains how the project's Sponsoring Agencies generated ideas and solicited the public, stakeholders, other agencies, and tribes for ideas on how to meet the Purpose and Need. The interrelationships of the interchanges requires a comprehensive solution in the corridor. However, the project is actively working to identify meaningful and efficient construction phasing to better adapt to the unique revenue challenges of recent years.

P-036-008

Thank you for your comments. Please refer to the responses above.

Hines, Maurice

From: Maye Thompson/Doug Allen [mayedoug@spiritone.com]
Sent: Sunday, October 23, 2011 1:00 PM
To: Columbia River Crossing
Subject: Columbia River Crossing FEIS Comments
Attachments: feiscomments.doc

SUBJECT: Columbia River Crossing FEIS Comments

(comments also attached as an MS-Word document)

P-037-001

I provided extensive comments on the CRC Draft EIS. Although those comments have been noted in the FEIS, they have not been dealt with in an adequate fashion. Essentially all of the flaws in the DEIS that I pointed out remain in the FEIS.

At the heart of the problem is the same flawed "No Build" option that is the basis for the "Purpose and Need" and that is used to justify the Locally Preferred Alternative. This flawed No Build option comes from straight-line projections of traffic growth, projections that have no scientific basis in rational statistical analysis or the behavioral sciences.

The traffic and congestion predictions in the No Build option were buttressed by population, employment, and trip-making projections flowing from the politically determined zoning in Clark County, not from any valid economic science regarding future growth.

The LPA was predetermined, not based on a valid DEIS process. Those outside the process can not, of course, know whether the flawed No Build option is the source of this predetermination, or whether it was ginned up to support a predetermined outcome, but the result is the same. The fact that then Regional Administrator David Cox described the predetermined outcome well in advance of the DEIS, was noted in my DEIS comments, but not adequately addressed. The FEIS seems to simply pound on the table and assert that the facts are so strongly in favor of the LPA that any appearance of early bias is simply acceptance of those putative facts.

The one major change in the FEIS, use of the "MOVES" model, does nothing to improve the original flaws. The original flaw was to analyze the behavior of vehicles, regarding their energy use and emissions of pollution under presumed operating scenarios, rather than analyzing the driving behavior of human beings in the long term. This flaw was not corrected.

As a result, the DEIS, and now the FEIS, have come to preposterous conclusions regarding traffic, congestion, energy-use, toxic pollution, and emission of greenhouse gases. People are not so stupid that they will continue to attempt to drive routes that become increasingly congested. The "four step" traffic modeling that was used in the CRC EIS process is notorious for ignoring the intelligence of people in the long run.

The "four step" approach is also notorious for ignoring the potential for increased transit ridership when starting from a base case, such as we have in Clark County and the "bridge influence area" of substandard existing transit service.

The entire EIS process was an exercise in deliberately ignoring or downplaying the potential for using tolling, transit, and low-cost options, by holding up the flawed No Build traffic projections. Staff adamantly claimed that low-cost options would not meet the "purpose and need." The FEIS is simply further table-pounding to reinforce this unsupported claim.

Actual traffic volumes, in the period subsequent to the CRC EIS analysis, prove that the CRC process was fatally flawed, and should be declared void. I would not suggest remanding this process to those who have spent much more than $100 million in such a flawed manner. Any further analysis of highway and/or transit across the Columbia River between Portland and Vancouver must be done under closer scrutiny

P-037-001

Some updates were made to the traffic modeling after the DEIS, as described in Section 3.1 of the FEIS, although none of the changes to either the modeling or the No-Build were as significant as Mr. Allen has recommended. Please see the responses to letter P-047 regarding your comments on traffic, population and employment projections, the travel demand modeling, low cost options, tolling, transit, fluctuations in actual traffic volumes, and the environmental impacts based on the traffic forecasts.

P-037-001

by those who are paying for this analysis, by people capable of studying all reasonable alternatives, and people capable of doing "least cost" planning, given the increasing scarcity of funds for infrastructure expansion.

Douglas R. Allen

734 SE 47th Ave.

Portland, OR

97215

October 23, 2011

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Douglas R. Allen
734 SE 47th Ave.
Portland, OR
97215
October 23, 2011

SUBJECT: Columbia River Crossing FEIS Comments

P-037-001

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As a result, the DEIS, and now the FEIS, have come to preposterous conclusions regarding traffic, congestion, energy-use, toxic pollution, and emission of greenhouse gases. People are not so stupid that they will continue to attempt to drive routes that become increasingly congested. The "four step" traffic modeling that was used in the CRC EIS process is notorious for ignoring the intelligence of people in the long run.

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Hines, Maurice

From: George Bafus [george_camas@yahoo.com]
Sent: Sunday, October 23, 2011 6:19 PM
To: Columbia River Crossing
Subject: CRC concerns

P-038-001

I have yet to see elevation drawings that show what this bridge would look like against the Vancouver skyline. Specifically, how much this tall structure will obscure views from adjacent buildings downtown. I don't mean "artist's conception" type drawings. I want to see the existing buildings drawn to scale, with the new bridge drawn in, from several vantage points. I suspect that if such drawings had been published in the Columbian, criticism would be considerable. I believe such information has been withheld for this reason: Those who stand to profit enormously from this project don't want this monstrosity to be accurately depicted. Only when it's too late will Vancouver realize what an eyesore they are stuck with.

George Bafus

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P-038-001

The project has followed current guidance and methods for assessing visual impacts. The analysis is described in detail in the Visual and Aesthetics Technical Report. These methods were approved by the local, state, and federal sponsoring agencies. Though there are not many computer simulations in the FEIS, the analysis is based on not just simulations but also plan and profile drawings, photographs, view corridors and view sheds. These all contribute to understanding and considering visual impacts, and they are referenced or included in the FEIS. These methods were sufficient for the public and decision makers' consideration of the local preferred alternative and bridge type. As the project enters final design, there will be continued effort to engage the community in design and aesthetic issues. The project will be charged with maximizing the aesthetic opportunities with the composite truss bridge type. This will include developing new simulated views to inform the decisions to be made during final design.

Hines, Maurice

From: Natalie Baker [natalie.x.baker@gmail.com]
Sent: Monday, October 24, 2011 4:04 PM
To: Columbia River Crossing
Subject: Feedback on CRC

Categories: Red Category

P-039-001

You want my feedback on the CRC as a citizen of Portland? My feedback is that I understand how excited you must be about this project--indeed, that bridge would be gigantic and to some people that is the basis for considering something to be impressive--but you need to look around you: this project's legitimacy is nonexistent these days. Important non-profits, news organizations, and citizens groups have all joined to form an overwhelmingly loud voice that unitedly asks you to stop moving forward. Why continue the farce of soliciting feedback when it is blatantly obvious that you won't actually take it into consideration? What exactly do you want feedback on this far in the process? Are you just asking for feedback so that when you plunge this city into debt and a further decrease in infrastructure we actually want, you can point to the fact that you solicited feedback and claim that the CRC was built through an inclusive process? You still have a chance to take the difficult but undeniably ethical path and admit fault, slowing the process down and revisiting the legitimate concerns that have ALREADY been voiced. Don't go through with something because you've already come so far--the real costs are yet to be felt by this city, and only you have the ability to prevent them. You asked for my feedback, and I took the time to give you my thoughts. Please show me that same level of respect by legitimately considering what I (and, I anticipate, many others) have said to you, either by slowing down the process to include important stakeholders and their concerns, or by replying to my feedback with why you will not do so.

Sincerely,
Natalie Baker

P.S. Every city planner in the world knows that if you want to cut down on auto use, you have to stop accommodating it through high-speed multi-lane infrastructure. How this city can simultaneously market itself as a leader in the bicycle movement while funding a megahighway is completely beyond me.

1

P-039-001

Input and feedback have been carefully considered during the project's NEPA process to date. Many changes have been made based on input from citizens and other interested parties who care about the impacts as well as the benefits of the proposed project (some of the changes made are discussed in Chapter 2 of the FEIS). The process was extended to allow the Independent Review Panel and then the Bridge Expert Review Panel time to evaluate and make recommendations on many aspects of the project. These recommendations also led to project changes (summarized in Chapter 2 of the FEIS). Although Ms. Baker has suggested that we slow the process down and rethink the direction, others comment that the process has gone too slow and we should advance it much faster to construction. All input is considered. At this point, the project is advancing the selected alternative into the final design process. The speed at which it advances through design and to construction will depend on decisions by agency leadership, which are subject to citizen input.

203 West 34th Street
Vancouver WA 98660-1908
October 19, 2011

To: Whom It May Concern
RE: CRC-FEIS comments (Columbia River Crossing-Final Environmental Impact Statement)

P-040-001

I oppose the taking of the Wallis Engineering building for the south-most parking garage, as specified in the FEIS.

I served as a member of the CRC-VTAC (Vancouver Transit Advisory Committee) and alternate on the VWG (Vancouver Working Group). When the VTAC began, plans presented showed the south-most parking garage inside the SR-14 to I-5 cloverleaf, on land already off the tax rolls. Months later, the plans changed suddenly to show it on the now partly vacant "auto dealer" lot east of Columbia and south of 5th. Then, at a subsequent meeting, its footprint expanded to include the block housing Wallis Engineering. The records show one objecting comment to removing these lots from the tax rolls, but the Committee was never asked for input on this, nor were the changes fully explained. VTAC and VWG had no self-selected leadership; agendas were controlled by staff.

The Wallis Engineering building is a historic structure, and I believe it is recognized by the county and/or state as a historic building. It has served a vital function as a business incubator for many small entities, recently including Vancouver Food Cooperative. The FEIS proposal would replace this beautiful historic building paying property tax with an outsized unsightly government-owned garage.

I'd hate to have the CRC proposal or public vote opposed because of this provision; small in terms of the CRC project, but tragic in its ramifications for this now nice mini-neighborhood. Consider how ugly a block in that part of town between 5th and the River could easily be.

If the rationale is, as has been stated, to preserve hotel views when the hotel paid for no such provisions, this is improper bias in favor of one business and against others.

Sincerely,

Kenneth M. Becker

P-040-001

The process that resulted in the Lucky Lager Warehouse being identified as an anticipated acquisition was part of ongoing work between CRC, the City of Vancouver, and C-TRAN. Decisions around the Columbia Park and Ride location and the roundabout at the southwest corner of the block were part of a collaborative process similar to decision-making and design development for the rest of the project. The project development process is dynamic and includes making assumptions, gathering additional information, and sometimes changing designs or assumptions based on new information or analysis. The project will continue to minimize or avoid impacts to properties, including the Lucky Lager Warehouse.

The CRC undertook a study called the Lower Vancouver Urban Design Study with the City of Vancouver, C-TRAN and the public. The major components of this study included vehicle circulation, development opportunities and mixed-uses, pedestrian access and safety, and urban design. Expansion of the park and ride footprint resulted from an analysis of the number of spaces required at this location and the height of the structure as compared to footprint. Four options were explored that resulted in structures that varied anywhere from four to six levels. The City of Vancouver suggested the parking structure be designed with a minimal, practicable height, which requires expansion of the footprint to maintain required number of parking spaces. Additionally the expansion of the footprint had benefits to the project's other transportation modes. Further analysis of the SR 14 terminus indicated the roundabout was the appropriate design for this intersection, preferred by both the CRC and the City of Vancouver. The CRC staff analyzed multiple roundabout alternative designs in order to minimize the footprint. Through that analysis it was determined that more right-of-way was required northeast of the roundabout. The combination of the above mentioned analyses resulted in the current design and impacts.

203 West 34th Street
Vancouver WA 98660-1908
October 19, 2011

To: Whom It May Concern
RE: CRC-FEIS comments (Columbia River Crossing-Final Environmental Impact Statement)

P-040-002

I oppose the inclusion in the FEIS of a parking garage on current WA DOT land in the Lincoln neighborhood, as an alternate location. It was clear from the DEIS that this option was discarded after significant citizen opposition, and it is indeed disturbing to see it remaining in the FEISD, even as an alternative.

The DEIS is filled with many reasons for not having a garage at the Lincoln site, so citizens were unaware that continued opposition was needed to exclude it from the FEIS.

Furthermore, it now appears that VFD (Vancouver Fire Department) will need to relocate their Main Street station now near Safeway, and the WA DOT land would be an ideal location with adequate access.

Sincerely,

Kenneth M. Becker

The FEIS describes the general process for selecting the LPA in the summary on page S-9 and in Chapter 2 starting on page 2-81. The purpose of the FEIS is to disclose the impacts related to the LPA compared to no-build and the DEIS alternatives and describe what has changed since the DEIS. The FEIS does not contain a detailed description of how each design refinement was done; that level of detail is not typical for an environmental document.

Although the Lucky Lager building is listed on the Clark County Heritage Register, it has not been found eligible for the National Register of Historic Places (NRHP). Qualified staff on the CRC project and from the Esther Short Subarea planning process years before, both determined the building modifications to be too extensive for the building to be NRHP eligible. Regardless of the specifics of eligibility and associated protections, the project has attempted to avoid displacement of any building. Buildings listed on the Clark County Heritage Register are given special consideration.

P-040-002

Thank you for your comment. The LPA does not include a park and ride station in the Lincoln neighborhood.

CRC EIS COMMENTS
Todd Boulanger, PO BOX 61542, Vancouver, WA 98666

P-041-001

P-041-002

P-041-003

1. The use of 2005 traffic volumes for the bridge traffic and transit ridership, etc. is inappropriate due to the availability of more current data for a 2011 EIS.
2. The discussion of vehicle crashes (pg 3-23) for the bridge is incomplete, as it includes only motor vehicle crashes and not al vehicles (bicycles).
3. On page 3-26 the discussion is incomplete, as it misses analysis of the adjoining public parking off street.
4. The analysis and discussion of future off street parking is missing the analysis of operation and maintenance cost of the new project park & ride facilities.
5. The analysis of the first and last mile access to transit stations is in complete, as there is no comparison to bike sharing as an option vs. driving SOV, bus transfers, etc.
6. The EIS mentions that bicycle access to future LRT stations/ P+R will be facilitated along a bike route along Columbia Street (pg 3-41) , but this facility is planned but not currently signed as a bike route yet. And the planned bike lane access along Columbia Street (Vancouver TSP/ VCCV) is threatened by addition of double turn lanes from Mill Plain couplet onto Columbia.
7. The EIS (section 3) discusses ADA and pedestrian improvements along the LRT route, but the analysis/ planned improvements is missing for station to station access (east to west across Main Street between Broadway to Washington or north to south on the other sections).
8. The discussion of future bike pedestrian access along/ across Fourth Plain to the north/south road to the Clark P+R (pg 3-42) is missing the proposed bike pedestrian facility from the Rose Village neighborhood along K Street dead end south of 26th St (west side of military graveyard), as discussed by the PBAC.
9. The discussion of future bike pedestrian access along/ across Fourth Plain to the new road to the Clark P+R (pg 3-42) is missing the proposed bike pedestrian facility from the Arnada neighborhood along G, H, & I Streets dead end, as discussed by the PBAC.
10. The discussion (pg 3-42) of future bike pedestrian access to future CRC built facilities (P+R, etc.), is missing the links to the SR500/ Leverich Park/ Discovery Middle School, as discussed by the PBAC.
11. The EIS content (Exhibit 3.1-26)) reporting planned/ proposed CRC bicycle pedestrian facility network to LRT stations in Vancouver is not equitable to that concerning the Portland jurisdiction, especially Hayden Island, given the PBAC input.
12. Page 3-50 analysis misses the option of the CRC project utilizing existing underutilized off street parking structure spaces (Vancouver Centre, etc.) vs. only discussing the hared use of future CRC stalls. The use of existing parking stalls (excess capacity) for the P+R could reduce the construction costs and minimize the loss of historical buildings along Columbia. The Vancouver Centre parking structure was enlarged to over 800 stalls vs. the smaller original structure and the 4th building has not been built nor is it likely to be built.
13. The discussion (pg 3-51) of the of the construction/ workzone impact mitigations does not go into enough detail, especially given the tools used during the Yellow Line construction.

P-041-001

The traffic volume cited in the FEIS (134,000 vehicles per day) was from a specific count conducted in October 2005 when all ramps and the mainline volumes were obtained simultaneously. The day in October 2005, which needed to be selected in advance for the major traffic counting effort, was within one percent of the average weekday traffic volume for the entire year (2005). Traffic volumes fluctuate and did decrease during some years. Traffic volumes obtained from the Oregon Department of Transportation's automatic traffic recorder (ATR) monitoring sites show that traffic volumes have, in fact, been increasing in the last few years. Whether the traffic volumes forecast for year 2030 will actually be achieved in that year should not be the only consideration. In its July 27, 2010 report, the Independent Review Panel expressed concerns about a longer horizon. The IRP commented, "The desirability of living in the Portland/Vancouver region is not going to diminish, so populations will continue to grow…. [T]he IRP believes the greatest risk in the decision-making process is not over-sizing the bridges but not building enough capacity for the next 100 years."

P-041-002

The section of the FEIS discusses vehicle crashes. Page 3-16 of the FEIS mentions the safety problems faced by bicyclists and pedestrians on the bridge.

P-041-003

Analysis of parking facilities will progress following the Record of Decision. There will be more specific assessment of the traffic and bike impacts at each site. The previous analyses have been more than sufficient to enable decision-making appropriate to the planning level of design. The project does not intend to utilize space in existing parking facilities as these have been constructed for other purposes, are not FTA facilities, and will presumably be more heavily utilized, consistent with the design projections which led to their sizing.

CRC EIS COMMENTS
Todd Boulanger, PO BOX 61542, Vancouver, WA 98666

P-041-003

14. Clarify the total effect of the Mill Plain lane closures (pg 3-51), as the text mentions a second turn lane onto Columbia, but this would effect important regional bicycle access to P+R stations (first and last mile).
15. There is no discussion of the work zone mitigations for continued bike lane access (pg 3-61).
16. Pgs 3-62 & 63 include an incomplete analysis of the mitigations for bike and pedestrian access due to parking.
17. There is inadequate discussion of the work zone/ closure mitigations developed during the bridge trunion repair project (Amtrak commuter rail, etc.) (pg 3-66).
18. The report analysis misses discussion of adding bikestation facilities to transit hubs in Vancouver and Hayden Island for the first and last mile access to LRT stations.
19. The EIS does not discuss why the minimum parking stall totals were increased between options and from the DEIS, thus enlarging the property takes.

You have asked about some very specific bike and pedestrian connections. The following details should answer your questions:

- The path between Rose Village and Fourth Plain, and the path between Fourth Plain and McLoughlin are planned project elements.
- The most direct route for the Arnada neighborhood to the proposed station on McLoughlin would be by way of G, H and I Streets directly to McLoughlin.
- No improvements are proposed on 39th Street in the LPA. A future project would complete the interchange at SR 500 by adding the ramps to and from the north, and would include improvements to 39th Street and allow the connections referenced to be made.

Hines, Maurice

From: Sharon Boyle [smboyle518@comcast.net]
Sent: Monday, October 24, 2011 7:38 PM
To: Columbia River Crossing
Subject: FEIS

P-042-001 What happens when The City initiative is presented on the ballot - with no City monies or employee support of the LPA is allowed?

1

P-042-001

The project is not aware of such an initiative and would need more information to respond. The Cities of Vancouver and Portland coordinate closely with CRC staff, though neither City is responsible for funding the project.

Ted Buehler
105 NE Beech St
Portland OR 97212
503-890-0510

24 October 2011

Comments: CRC EIS

1) **Environmental Justice:**

P-043-001 Section 3.5.5. There is no discussion of the increased congestion on I-5, primarily southbound, though inner N and NE Portland. The Boise, Humboldt, Concordia and Kenton neighborhoods have high poverty and high minority populations. Increasing air pollution through increased gridlock in these neighborhoods should be addressed. Also, increased traffic on Greeley, Denver, Interstate, Vancouver/ Williams and MLK should be addressed, as traffic will divert off I-5 from downtown to the Columbia River to avoid gridlock on I-5.

2) **Bicycle Mitigation during construction**

P-043-002 Page 3-61 should include facility improvements during construction to offset the degradation of the route during construction. This could include pavement improvements, wayfinding improvements, pavement widening, and other things to bring the current route up to ODOT and AASHTO standards during the construction process.

3) **Spillover traffic incorrectly counted as "leaving the I-5 corridor**

P-043-003 Page 3-11 shows 35% of the I-5 bridge traffic leaving the project corridor on the Oregon side of the river. Anyone who has ever observed traffic backing up on N Interstate or N MLK knows that drivers use surface streets to avoid I-5 congestion through North Portland. This graphic should be corrected after data is collected pertaining to how much of the traffic that "leaves" is actually going to or from downtown Portland.

4) **No accounting of increased bicycle travel time with circuitous route**

P-043-004 Page 2-34 shows the bicycle route taking a 4-block long, 360 degree loop to get from the bridge deck to downtown Vancouver. This creates an unjust delay to bicycles relative to cars. They are forced to travel down to the riverbank in a big circle while cars travel directly through past downtown Vancouver. The bike route needs a second "exit" from the bridge facility to Fort Vancouver, at the "Community Connector" feature. This would shorten travel time from most points in Vancouver into Portland by 8 minutes over the current design.

Any civil engineer knows that routes should be designed to be direct. This "loop" will create a permanent penalty of time and energy for every bicycle trip across the river, compared to the equivalent car route. Bicycles should not be penalized for their mode choice with longer, hillier routes.

An analysis should be done comparing the bicycle route to the car route through the project area. The bicycle route should be comparable in terms of distance and topography.

5) **No giant parking garages**

P-043-005 Exhibit 2-2-19 shows three mammoth parking garages. At 400 spaces each, these will cost over a million dollars each to build. How about eliminating these garages, developing the land with mixed

P-043-001

Neither the CRC project nor the Delta Park projects are intended to address the southbound traffic congestion that currently exists near the I-5/I-405 split. However, traffic analyses show the congestion at the split will not be worsened because of the Columbia River Crossing project. The main reason is that fewer cars are expected to cross the river with a project in 2030 than without a project. This is due to the provision of improved transit service and tolling. Furthermore, because the Interstate will provide better mobility with the LPA, cut-through traffic on parallel neighborhood streets will be reduced.

P-043-002

In Section 3.1 of the FEIS, and in the Record of Decision, the project has identified a number of construction-period mitigations for bike facilities. As the project designs are advanced, these mitigations will also advance. The project and construction contractors will work with the community to provide suitable improvements and will refine these throughout the various stages of construction.

P-043-003

The data used in the analysis show that much of the exiting traffic has destinations within the subareas where the exits are. Many of these vehicles are, therefore, actually only using and only needing to use the Interstate for short trips. The Traffic Technical Report provides more details regarding these commute patterns. The project does recognize that many motorists exit the Interstate and use parallel routes in order to avoid the congestion on the Interstate. Many of these trips will return to the Interstate when congestion is relieved.

P-043-005 use TODs, and using the dollar saved to extant MAX to Clark College and through to the high-density neighborhoods along Fourth Plain and 18th Aves in Vancouver?

6) **Unrealistic assessment of northbound commute benefits**

P-043-006 Exhibits on page 3-153 shows a penalty to southbound Portland commuters for bridge construction. Traffic congestion (caused by Washington State Commuters) is simply shifted from downtown Vancouver to North Portland. But the northbound traffic shows no gridlock anywhere. This is suspect, as there is an equal amount of northbound traffic. It seems that it will be backed up in downtown Portland -- the delays will be on the Morrison Bridge and other I-5 on-ramps. These should be shown in the study.

7) **Bicycle Facilities in the proposal are not "World Class"**

P-043-007 Appendix F
Portland and Metro's endorsements (Portland Resolution No. 36618, July 9, 2008, and Metro's Resolution No. 08-3960B) both call for *World Class Bicycle Facilities* and for bicycle facility improvements *throughout the project area.*

Specifically, Portland calls for
BB 1. "The facility should meet or exceed standards set by "World-Class Facilities."

and Metro calls for
"The project should design "world class" bicycle facilities on the replacement bridge, bridge approaches, and throughout the bridge influence area that meet or exceed standards..."

The Bicycle and Pedestrian Committee did extensive research on their own time to identify what characterizes "World Class" facilities. They presented the material to the Project Sponsors Council, and their recommendations were systematically rejected. The main span is acceptable, but not world class. The approaches are poor, forcing bicycles to wander through all sorts of twists and turns, stopping and starting, and much out-of-direction travel. The facilities in the EIS are decidedly NOT "world class" when compared with the standards developed by PBAC.

Nor do they extend through the bridge influence area. There are no improvements south of Marine Drive in Portland or north of 7th St. in Vancouver. This is far short of the bridge influence area, and leaves bicyclists on outdated, dangerous, third-rate facilities in both Portland and Vancouver while they ride through the project influence area.

The CRC should follow these directives from Portland and Metro and upgrade the planned bicycle facilities.

P-043-004

The project has worked to shorten the bike pathways as much as possible while also keeping the grades (inclines) to a reasonable level and within established standards. Although the landing in Vancouver will require a loop ramp, the existing facility (west of I-5) currently relies on a long loop. The current east side loop, though smaller, requires sharp turns through a driveway and parking lot.

The idea of bringing a multi-use path all the way to the connector has been studied. A bike path from the River Crossing Bridge to the Community Connector will not be built due to geometric constraints through the SR 14 interchange. Standard vertical clearances under and over SR 14 ramps must be achieved and a 5% maximum path running grade is required for ADA compliance. A path through the SR 14 interchange would require excessively steep grades of 10-30%. Additionally, such a path would face complexities at the BNSF overcrossing, potentially enter into the Pearson Airspace and would impact Section 4(f)-protected properties to the east.

Also, the Reserve will be more accessible by bike since Apple Tree Park will be accessible from Main Street.

P-043-005

Decisions over the location and number of parking spaces provided at park and rides were designed to maximize ridership on light rail transit and are not expected to be eliminated. As described in the Indirect Effects Technical Report, transit-oriented development is predicted around transit stations and near the park and rides.

P-043-006

Although the specific reference could not be located, Mr. Buehler's point appears to be clear. The northbound commute will experience less congestion with the LPA, because the major bottleneck at the bridge will

be improved. In the southbound direction, however, there remains a congested bottleneck condition at the Rose Quarter. The LPA will reduce the number of cars entering the Rose Quarter from the north, but an improvement at that location will likely still be needed in the future, regardless of the CRC project outcomes.

P-043-007

As discussed in the DEIS and FEIS, a replacement bridge over the Columbia River will include dramatically improved bicycle and pedestrian facilities by providing:

- A new 16- to 20-foot multi-use pathway over the Columbia River completely separated from vehicle traffic due to the design of the Stacked Transit Highway Bridge;
- Protections from traffic noise, exhaust, and debris for pedestrians and bicyclists on the river crossing;
- More direct connections on each side of the river, consisting of stairs, ramps, and elevators, as well as pathway extensions that connect in with existing or planned facilities and public transit;
- Many new or enhanced sidewalks, bike lanes, and crosswalks near the bridge and throughout the project area.

Since the publication of the DEIS in May 2008, and the selection of the LPA in July 2008, the CRC project team has continued to work with the Pedestrian and Bicycle Advisory Committee and project partners to refine route and facility design. The updated design, as described in Chapter 2 (Section 2.2) of the FEIS, is the outcome of a long collaborative process.

From: Ron Buel [mailto:ronb@donavoncards.com]
Sent: Monday, September 19, 2011 12:23 PM
To: Columbia River Crossing
Cc: 'Nigel Jaquiss'; 'Jeff Manning'; sduin@oregonian.com; smirk@portlandmercury.com; Collette, Carlotta; carlhosticka@metrocouncil.or.us; Joe Cortright; bobstacey@mac.com; Shirley.craddick@oregonmetro.gov; mara@cfuture.org; jimhowell89@hotmail.com; fredtrain@aol.com; Chris Smith; Joe Smith; sharonnasset@aol.com; PerkinsRealty@comcast.net; 'Rep EyreBrewer'; Rep.mitchgreenlick@state.or.us
Subject: FW: [Bridgeteam] CRC's Final Environmental Impact Study

Dear Columbia River Crossing Feedback:

P-044-001 I read more than 200 pages of submitted testimony raising, as Fred Nussbaum says below, substantive comments about the faulty assumptions, analysis and conclusions in the DEIS. I can find **no** response to any of these questions and comments in the FEIS, nor have there been any truly substantive changes in the FEIS from the DEIS on the subjects we commented upon. None of the people who submitted this testimony in writing have ever been contacted by the CRC. Please explain why you have not responded to those of us who testified in writing, spending hours on our efforts. Please explain why there is **no** response to our testimony in the FEIS. Doesn't this make a mockery of the citizen participation process on the Columbia River Crossing?

Ronald A. Buel, 2817 NE 19th Ave., Portland, OR 97212 -- 503-358-8677

From: bridgeteam-bounces@smarterbridge.org [mailto:bridgeteam-bounces@smarterbridge.org] On Behalf Of
fredtrain@aol.com
Sent: Saturday, September 17, 2011 8:26 PM
To: feedback@columbiarivercrossing.org
Subject: Re: [Bridgeteam] CRC's Final Environmental Impact Study

P-044-002 Excuse me. The FEIS isn't only supposed to be another propaganda piece. It's supposed to answer all the comments received on the DEIS. You got a lot of substantive comments about the faulty assumptions, analysis and conclusions in the DEIS and documents leading up to it. Some comments were quite extensive in their scrutiny and suggestions of alternatives.

Fred Nussbaum
6510 SW Barnes Road
Portland, OR 97225
503.292.5549

P-044-001

The FEIS provides a summary of public input, responses to every letter submitted on the DEIS (Appendix P), and a summary of project changes that have occured based on public input (Section 6.4).

P-044-002

Please see the response above.

-----Original Message-----
From: Columbia River Crossing Project <feedback@columbiarivercrossing.org>
To: FredTrain <FredTrain@aol.com>
Sent: Thu, Sep 15, 2011 9:17 pm
Subject: CRC's Final Environmental Impact Study

You're Invited

to learn about plans to address safety and traffic problems on I-5.

Publication of the Columbia River Crossing (CRC) Final Environmental Impact Statement (EIS) brings the project closer to completing the planning phase. The Final EIS contains analyses of the project's potential environmental and community effects. It also describes how a replacement Interstate Bridge, light rail and other project elements will improve safety and relieve congestion.

Drop-In Information Sessions

Wednesday, October 12, 2011
2 – 4 p.m. and 6 – 8 p.m.
Vancouver Community Library
901 C Street, Vancouver, WA 98660

Thursday, October 13, 2011
2 – 4 p.m. and 6 – 8 p.m.
Jantzen Beach SuperCenter Community Room
1405 Jantzen Beach Center, Portland, OR 97217

PLAN YOUR TRIP: www.trimet.org or www.c-tran.com

For more information about the FEIS drop-in information sessions please visit our website.

Direct questions or comments to feedback@columbiarivercrossing.org

Hines, Maurice

From: Ron Buel [ronb@donavoncards.com]
Sent: Monday, October 24, 2011 2:52 PM
To: Columbia River Crossing
Cc: Joe Cortright; mara@clfuture.org; 'Jeff Manning'
Subject: Completely inadequate FEIS for CRC

Dear CRC:

P-045-001

As testimony on the CRC DEIS, Joe Cortright and I submitted a long paper about land-use in Clark County - the 5,000 acres of un-developed farmland in Clark County that is currently zoned for housing. The FEIS, like the DEIS, says there will be 30 years of static land-use - no growth in Clark County. This implies that a new freeway bridge would not make any difference to the rate of development in Clark County in the future. This is not a believable assumption. A new freeway bridge will bring new development, and therefore increased travel across the Columbia on I-5, within the 30 year period covered by the FEIS. Clark County and Vancouver planners assume population growth rates through 2030 - such population increases will be stimulated by perceptions that a new bridge will make travel easier and less congested, and you have not accounted for such growth in automobile travel across the Columbia caused by a new bridge. Nor do your air pollution figures, nor your carbon dioxide projections account for such induced travel.

It is also unrealistic to assume that light rail transit will carry 37% of trips in 2030 or 2035. This is far too high, since people will still have to get in their cars to drive to the park-and-ride garages near the light rail stations, and the trip on the Yellow Line has nine stops between Hayden Island and Portland's central city. Time savings on light rail will not be that great, compared to the automobile, especially if you are adding more freeway capacity. These light rail ridership figures are simply not realistic. Therefore, you have further under-estimated the travel on light rail.

Further, Stantec told Oregon State Treasurer Ted Wheeler that the Metro travel models used by the CRC are not capable of predicting what percentage of trips will use the I-205 Glenn Jackson Bridge instead of paying a toll to use the CRC. Therefore your projectios of what the un-tolled Glenn Jackson usage will be, when compared to toll rates on the CRC that are not yet final, has not been accurately assessed by your FEIS. Nor can you accurately assume what impact such route-changing will have on congestion on I-205, and the resulting impacts on air pollution and carbon from such switching of routes by commuters are similarly rendered inaccurate by this problem.

Your FEIS does not attempt to assess impacts on parallel arterials to I-5, nor on travel on arterials to and from entrances (and exits) on I-5. This is particularly troublesome because this means that you have not accurately assessed net effects on air pollution and greenhouse gas emissions in the nearby neighborhoods from CRC travel. Your work has only assessed the impacts on I-5 within the bridge impact area, leaving you making predictions of air pollution and carbon that cannot, therefore, be accurate on a net basis.

You have not accurately assessed the congestion impacts at Victory Blvd. or Delta Park, when the seven lanes going South coming off Hayden Island and Marine Drive South narrow to three lanes at Victory Blvd. This junction is

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P-045-001

As described in Chapter 3 (Section 3.4) of the DEIS and FEIS, and in the Indirect Effects Technical Report, highway capacity improvements and access improvements can induce development in suburban and rural areas that were not previously served, or were greatly underserved, by highway access. The DEIS outlines a comprehensive analysis of the potential induced growth effects that could be expected from the CRC project. A review of national research on induced growth indicates that there are six factors that tend to be associated with highway projects that induce sprawl. These are discussed in the Indirect Effects Technical Report. Based on the CRC project team's comparison of those national research findings to CRC's travel demand modeling, Metro's 2001 land use / transportation modeling, and a review of Clark County, City of Vancouver, City of Portland and Metro land use planning and growth management regulations, the DEIS and the FEIS conclude that the likelihood of substantial induced sprawl from the CRC project is very low. In fact, the CRC project will likely support the region's goals of concentrating development in regional centers, reinforcing existing corridors, and promoting transit and pedestrian friendly development and development patterns. The region's goals are reinforced by the project's location in an already urbanized area, the inclusion of new tolls that manage demand, the inclusion of new light rail, and the active regulation of growth management in the region.

In October 2008, the project convened a panel of national experts to review the travel demand model methodology and conclusions, including a land use evaluation. The panel unanimously concluded that CRC's methods and conclusions were valid and reasonable. Specifically, the panel noted that CRC would "have a low impact to induce growth… because the project is located in a mature urban area," and that it would "contribute to a better jobs housing balance in Clark County… a positive outcome of the project". These results are summarized in the "Columbia

P-045-001 going to be at 99% of capacity, stopping traffic and backing it up onto the bridge during every morning commute. As a result, projected improvements in peak Southbound congestion will not materialize from construction of the CRC. This also has air pollution, air toxic and greenhouse gas ramifications - they will be much worse than you projected for the CRC.

You have built a strawman of a No-build which vastly over-states the congestion that will occur in the traffic modeling years of 2030 and 2035 if there are no changes to the existing I-5 bridges. Traffic has been declining on the I-5 bridges over the last decade, especially in response to the increase in gasoline prices which, across the nation, is causing people to drive less. You make your CRC projections look better when compared to this unrealistic No-build strawman. You under-state the congestion that will occur with the CRC (and on the Glenn Jackson Bridge) while vastly over-stating traffic and congestion (and air pollution and carbon) from the No-build outcome.

P-045-002 I do not see in the FEIS projections of impact of construction (nor length of the in-water work window) on endangered salmon runs in the Columbia. The newest bridge design will also have more pillars near the shore, which will also have negative impacts after construction to the salmon run that have not been calculated in the FEIS. Net, net, you have not realistically projected the impact on salmon runs from construction and a completed bridge.

P-045-003 I do not see in the FEIS the impacts fairly assessed on the more than 20 historic sites near the project.

P-045-004 I do not see numbers on losses of jobs from the closing of 39 businesses (approximately 600 jobs) on Hayden Island and 50 businesses in Vancouver.

P-045-005 I do not see assessments of the economic impacts of disruption on businesses not taken by the CRC, from the seven years of construction of the CRC project.

Cordially,

Ronald A. Buel
2817 NE 19th Ave.
Portland, OR 97212

River Crossing Travel Demand Model Review Report" (November 25, 2008).

In 2010, Metro ran the MetroScope model (an integrated land use and transportation model) to forecast growth associated with transportation improvements of a 12-lane river crossing and light rail to Clark College. Even with a 12-lane river crossing, the model showed only minimal changes in employment location and housing demand compared to the No-Build Alternative.

For a more detailed discussion regarding potential indirect land use changes as a result of the CRC project, including the likely land use changes associated with the introduction of light rail, please see Chapter 3 (Section 3.4) of the FEIS. By 2030, the region's population is expected to increase by one million people. This increase will result in more people needing to travel between home, work, school, recreation, etc. In 2005, 135,000 vehicles crossed the Columbia River on the Interstate Bridge, which led to 4-6 hours of congestion each weekday. By 2030, 184,000 are predicted to cross the river, which would lead to 15 hours of daily congestion if no action is taken.

Congestion occurs when vehicle demand is greater than a transportation system's capacity. It results in slower speeds and increased travel times. CRC defines congestion as vehicles traveling less than 30 mph. The Columbia River Crossing project uses information gathered from Metro's nationally-recognized travel demand models to determine the project's effect on congestion. These models predict trip frequency, types or modes of transportation, destination, and time of day. Transportation planners use these models to analyze the effects of such factors as increased population and employment, transportation improvements, and new developments on the transportation system.

Traffic volumes fluctuate and did decrease during some years. Traffic

volumes obtained from the Oregon Department of Transportation's automatic traffic recorder (ATR) monitoring sites show that traffic volumes have, in fact, been increasing in the last few years. Whether the traffic volumes forecast for year 2030 will actually be achieved in that year should not be the only consideration. In its July 27, 2010, report, the Independent Review Panel expressed concerns about a longer horizon. The IRP commented "The desirability of living in the Portland/Vancouver region is not going to diminish, so populations will continue to grow…. [T]he IRP believes the greatest risk in the decision-making process is not over-sizing the bridges but not building enough capacity for the next 100 years."

Based on the Metro model's past ability to predict transportation effects, the CRC project is confident in the data received from Metro and uses it to determine what impact the project will have on congestion. The improvements proposed by the project to the highway and seven interchanges will help better accommodate increased future vehicle traffic. New auxiliary lanes and longer on/off ramps will allow safer and more efficient merging and weaving to enter or exit the freeway. Narrow lanes and shoulders will be widened to current standards. Shoulders will be added where they are currently missing. All of these changes will improve the flow of traffic in the bottleneck area of the Interstate Bridge.

The air quality evaluation presented in the DEIS assessed how emissions would be expected to change by 2030 and how the project would affect emissions of pollutants regulated by state and federal standards as well as vehicle emissions that are not regulated. Oregon and Washington, as well as the federal government, have established ambient air quality standards for criteria pollutants. These standards are based on human health risks. The DEIS evaluation included an analysis demonstrating that the CRC project would allow the region to retain conformity with state and federal air quality standards for relevant criteria pollutants. See the Air Quality Technical Report for a detailed

explanation of the state and federal regulations concerning air quality and the evaluation of how the project complies with relevant air quality regulations. See Section 3.10 of the FEIS for an updated explanation of the pollutants regulated by state and federal law.

The DEIS also evaluated how the project alternatives would affect emissions of mobile source air toxins (MSATs) from I-5 traffic. MSAT emissions from vehicles are not currently regulated. The evaluation in the DEIS found "that future (no-build or build) emissions of all pollutants would be substantially lower than existing emissions for the region and the subareas" (page 3-277). These reductions in emissions are largely the result of on-going reductions in vehicle emissions that will occur with or without the project, and are based on standard assumptions regarding future vehicles and fuel. The anticipated vehicle emission reductions are based largely on regulation-driven improvements in fleet fuel efficiency standards and cleaner gasoline and diesel fuels. Any extraordinary improvements in fleet fuel efficiency or fuels would result in even greater emission reductions. Projected reductions in vehicle fleet emissions would result in a 25% to 90% reduction in I-5 related criteria pollutant emissions over existing conditions, even with the anticipated growth in population, employment and VMT. In addition, the build alternatives would provide small further reductions in vehicle emissions at the regional level and for most pollutants in each of the subareas along I-5. CO and NOx emissions would be slightly higher with the project than with No-Build (but still lower than existing conditions) in the I-5 subarea between the SR 14 and SR 500 interchanges, as discussed in DEIS Chapter 3 (Section 3.10) and FEIS Chapter 3 (Section 3.10). The updated analysis conducted for the FEIS resulted in very similar findings to those in the DEIS.

P-045-002

Page 3-393 in Section 3.16 of the FEIS document provides discussion on the in-water timing of any necessary dredging and cofferdam

placement (November 1 through February 28) and in-water impact pile driving (September 15 through April 15). This page also summarizes the likely impacts to ESA-listed salmonids and eulachon from impact pile driving which was identified as the largest impact to aquatic systems of the project. Total shading from project construction is discussed on page 3-394. Exhibit 3.16-9 provides a summary of project elements' effects on ESA-listed species. Other activities are proposed to occur year-round as discussed in the Ecosystems Technical Report. Exhibit 5-1 in the Ecosystems Technical Report presents a proposed sequencing of in-water structure construction.

The LPA will not have an increased number of piers or pillars near the shore compared to that addressed in the DEIS or during ESA consultation. Removal of the existing bridge after construction of a new bridge will result in an increase in shallow water in the Columbia River and a loss in North Portland Harbor. Quantification of shallow water impacts are discussed on pages 3-390 and 3-391 of the FEIS.

Much more detailed analysis on short-term and long-term effects on listed and other native aquatic organisms is provided in Sections 4 and 5 of the Ecosystems Technical Report. Analyses in the technical report address near-shore and shallow-water effects from temporary structures and shallow-water structures, cofferdams, piers and shafts, shading, etc.

P-045-003

Section 3.8 of the FEIS provides details about each impact. The Archaeology and Historic Built Environment Technical Reports also provide additional information.

P-045-004

Section 3.4 of the FEIS and the Economics Technical Report describe the impacts to local jobs associated with displacements.

P-045-005

The impact of construction activities on businesses is considered in the FEIS. Please see discussions in Section 3.4 (Land Use and Economic Activity), specifically the subsections on Temporary Effects and Mitigation.

Hines, Maurice

From: Bob Clark [elvsy3k@yahoo.com]
Sent: Friday, October 21, 2011 9:43 PM
To: Columbia River Crossing
Subject: Public comment

To whom it may concern:

P-046-001 I recommend the light rail portion of the Columbia River Crossing Project (CRC) be eliminated in its entirety. My key objections are the link to the existing north portland light rail line is not a practical method for transporting the many bus riders going between Vancouver and central Portland (especially downtown Portland). The existing North Portland light rail commuter line is too slow and has too many stops requiring way too much time for the many folks traveling between these two points currently using the C-Tran bus service. Secondarily, the cost of the light rail portion of CRC is too much considering the small fraction light rail would represent of total trips by all modes.

Bottom line: Proceed with project but without its light rail component. Keep the C-tran service as is.

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P-046-001

Light rail has been endorsed by every local Sponsoring Agency (Vancouver City Council, C-TRAN, RTC, Portland City Council, TriMet, and Metro), whose boards include elected officials from throughout the area.

Annual light rail passenger trips crossing the I-5 bridge in 2030 are projected to be 6.1 million, with daily ridership around 18,700. The travel time for the morning commute by light rail between downtown Vancouver and Pioneer Square in downtown Portland will be approximately 34 minutes. Light rail would travel on a dedicated right-of-way, with more reliable travel times than auto drivers dealing with unpredictable road conditions, traffic congestion, and parking challenges.

The CRC project planning for light rail incorporates and supports the principles of the Vancouver's City Center Vision Plan. Downtown Vancouver has seen recent growth in higher density mixed use projects from three to 12 stories in height. In addition, another 4,000 downtown condominiums are proposed or pending as part of new developments. The core of Vancouver has, along with many of the larger corridors such as Fourth Plain Blvd, medium to high density residential development and an urban mix of uses. Transit demand in these areas is quite high, and ridership will increase with the introduction of light rail.

Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on having a public vote.

Hines, Maurice

From: jcortright [jcortright@gmail.com]
Sent: Monday, October 24, 2011 1:37 PM
To: Columbia River Crossing
Subject: Comments on FEIS
Attachments: Cortright_FEIS_Comments_24Oct2011.pdf; FHWA_NEPA_Guidance.pdf; NEPA Planning Requirements 2-9-11-1.docx; RE_ BRP recommendations and NEPA w attachment.pdf; RE_ FTA_FHWA re-eval checklist.pdf; Williams_Derry_2011_DisappearingCars.pdf; Williams_Derry_2011 _WashingtonVMT.pdf; Williams_Derry_WSDOT vs. Reality 2011.pdf; Williams-Derry 2011 Multnomah County _ Sightline Daily.pdf

P-047-001

Please accept the following letter and attachments as comments on the Final Environmental Impact Statement for the Columbia River Crossing.

Please confirm receipt of this correspondence at your earliest convenience.

Joseph Cortright
1424 NE Knott Street
Portland, OR 97212

503.515.4524

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

P-047-001

This introduction in Mr. Cortright's letter provides a brief summary of a few of the detailed concerns that he expresses in the body of his letter. Please see below for responses to each of his detailed comments that are noted in this introduction.

IMPRESA
ECONOMICS

October 24, 2011

Columbia River Crossing
c/o Heather Wills
CRC Environmental Manager
700 Washington Street, Suite 300
Vancouver, WA 98660

RE: Columbia River Crossing Final Environmental Impact Statement

Dear Ms. Wills:

P-047-001

I submit the following written comments for consideration as the US Department of Transportation reviews the Final Environmental Impact Statement for the proposed Columbia River Crossing.

The Final Environmental Impact Statement (FEIS) fails substantially to meet the requirements of the National Environmental Policy Act (NEPA), and therefore you, and your subordinates at the Federal Highway Administration and Federal Transit Administration, should decline to enter into a Record of Decision, and should instead undertake additional analysis to comply with NEPA.

The FEIS does not disclose either the true nature of the project as it is likely to be built, nor does it accurately disclose the impacts of this project on the region. I have several comments in the text of this letter, but I will highlight three in particular:

1. You do not know what portions of the project will be built, and as a result cannot accurately assess its impacts, because project funding has not been determined, and the project will be broken into phases, and there is no assurance that discrete phases of this project will have the effects presented here.
2. CRC traffic forecasts are wrong, the traffic models used to produce them have been acknowledged by their authors to be incapable of accurately forecasting traffic on tolled facilities, and traffic projections have not been revised since the DEIS to correct acknowledged errors and changes in conditions.
3. The FEIS fails to present any current or historical information on actual traffic levels on the I-5 bridges. Traffic volumes are significantly lower than represented in the FEIS, and are declining, not increasing.

Approval of the Final Environmental Impact Statement is a momentous responsibility: the Department of Transportation's obligation to certify to the citizens of the region and

P-047-001

the nation that it has fully analyzed, disclosed and considered the project's impact on the region's transportation system, its environment, and the region's communities and people. You have an important duty to assure that this information is accurate, complete and fair.

My analysis shows that the FEIS presents an incomplete, inaccurate and deceptive view of the project's impacts, and therefore US DOT ought to postpone proceeding further with this project until the information in the FEIS is corrected.

1. CRC project financing is highly uncertain, making it impossible to know what will actually be built and therefore what will be the actual environmental, social and land use impacts

P-047-002

In order to assess the impacts of the project, you have to know what the project is. It is clear from the record that the scale of the project will be adjusted to fit available financing. But as yet, the project's financing is simply conjectural: none of the sources of funding (federal highway earmarks, FTA transit funding, Oregon and Washington gas tax increases, tolls, and a CTRAN sales tax) have been committed to the project. The Governors have directed that the project be phased, and the CRC has indicated that it is planning to break the project into phases, but as yet, no meaningful action has been taken.

It is apparent from the staff report that the financial plan for the CRC is completely unresolved at this point. We have no idea what kind of project will actually be built, so we have no way of accurately assessing its impacts.

The CRC depends on a complex, multi-part financing plan. None of the parts of the plan have yet been approved by any of the bodies that must approve such funding. There are four key elements to this financing plan: toll bonds, Oregon and Washington appropriations, federal New Starts funding, and federal highway funding.

The CRC financing plan rests on seven key assumptions about decisions that will be made and amounts that will be provided for project funding:

1. Washington legislative approval of facility tolling.
2. Washington legislative approval of funding for the state share of the project.
3. Oregon legislative approval of funding for the state share of the project.
4. Earmarking or Federal Highway Administration approval of funding for the highway portion of the project.
5. Federal Transit Administration approval of New Starts Funding

P-047-002

It is common practice on large public proposals to secure the funds to construct the project after the NEPA phase is complete. In fact, to commit certain types of funds prior to issuing the ROD would violate federal law. Some types of federal funding commitments are considered "federal actions" and therefore cannot be made until after the ROD is issued.

Regarding phasing, the FEIS evaluates the full impacts of the entire project and evaluates how those impacts may differ if three elements were to be constructed at some later date. This is described on page 2-86 of the FEIS and the likely impacts are discussed in each section of Chapter 3 and in Chapter 5. As the FEIS notes (page 2-4), a wide range of possible cash flow scenarios and construction phasing scenarios are possible. Phasing a project can change the timing of impacts but does not generally make a significant difference in the character or magnitude of impacts. Prior to the ROD, it is not possible to know how much funding the project will receive or when it will receive it and therefore it is also not possible to know how it will be phased. Following the ROD, as commitments to funding are secured and the timing of funding becomes known, the effect of phasing or sequencing can be reviewed to determine if it would change the existing NEPA evaluation of environmental impacts and/or mitigation in a meaningful way. Any changes could be assessed through a NEPA re-evaluation, as appropriate, and a determination would be made at that time if any additional NEPA review would be needed.

This is consistent with NEPA and with Transportation Planning requirements. As described in an FHWA Guidance Memorandum[1], a major project that does not identify project phases in the ROD can decide at a later date to construct the major project in phases.

[1] This is from Question and Answer #28 of the 2/9/2011 Supplement to

the “January 28, 2008 Transportation Planning Requirements and their Relationship to NEPA Process Completion Distribution Memo”.

P-047-002

6. Oregon and Washington Treasurers' approvals for the authorization of toll-backed revenue bonds
7. Voter approval in the CTRAN district or a portion thereof of operating funds for light rail.

In order to construct the project as currently described by the Project Sponsors Council, all of these financial approvals must be made, and made at the full amount budgeted. If any of these sources of funds or approvals is not made, or if funding is provided at less than the budgeted amount or if funding or approval is delayed, there is no assurance that all of the component parts of the project will be constructed.

There are major risks that one or several of these assumptions are incorrect and that expected sources of funding will not materialize, and additional risks that they will not materialize in the amounts budgeted or on the schedule currently planned.

In addition, it now seems certain that the project will need to be broken into a series of separate phases. The timing and the ultimate scope of the Columbia River Crossing project will depend upon the amount of funds received for project construction. There is no assurance at this time that any given component of the project will be completed.

At the present time, it is highly likely that funding will not be available to construct the entire project as described. Acknowledging this fact, on July 20 of this year, Governor John Kitzhaber directed CRC to develop a “sequencing” plan for the project (Kitzhaber 2011):

> The Treasurer also identified potential replacement revenue strategies, which I appreciate and am willing to explore. But I believe that if we are going to get the CRC done, it is time to start planning for a project that adapts to the available resources and fits into today’s economic reality. To that end, I am going to ask the Oregon Department of Transportation and the CRC to prepare a sequencing plan that accommodates anticipated cash flow.
> (Kitzhaber 2011)

The need to sequence or phase the project to fit available funding is likely to result in major changes to the project's scope, timing and ultimate impacts. More than a year ago, the Independent Review Panel appointed by then-Governor Kulongoski and Governor Gregoire concluded that the project would need to be broken into phases because of the low likelihood of all of the projected funding materializing. The IRP recommended the project be broken into three phases each of 1 to $1.5 billion (Independent Review Panel 2010, page 186). The IRP is particularly significant because the Directors of the Oregon and Washington Department’s of Transportation both said that they accepted the report and agreed to implement its findings (Garrett and Hammond 2010). The IRP also recommended that phases be constructed to be independent and self-standing, so that the

P-047-002

project would be functional regardless of whether funding for subsequent phases was ever realized.

The IRP warned that there may not enough money to complete the whole project and that it ought to be designed so that it could be built in phases, and that if subsequent funding did not become available—which it specifically identified as a possibility—that the project would be functional.

> There is a possibility that despite best efforts to assemble funding, the Project Sponsors may encounter a significant shortfall in funding to complete all of CRC as currently envisioned. There is also a possibility that a number of current uncertainties in design and schedule will adversely affect the total cost of the project. Projects of this size and scope are often planned and developed assuming a phased construction effort. Phasing (as opposed to staging) refers to the completion of some major portion of a total project, with such completion having meaningful value, yet deferring subsequent construction till later, often uncertain, dates when additional funding can be obtained.
> Independent Review Panel 2010, Page 185

Because the project will be phased or sequenced, and that phasing plan has not even been presented, much less adopted, no one has any assurance as to what portion of the project will actually be built. Because the project consists of a diverse array of components, some of which increase traffic (new bridge lanes, new intersection capacity), and others which reduce or divert it (light rail transit, tolling), not knowing which phases will actually be built means that the FEIS fails to disclose what will be the net environmental, economic and social impacts of this project. This means the FEIS does not comply with the requirements of NEPA.

2. CRC traffic and toll revenue forecasts are inaccurate, meaning traffic and traffic related impacts are not accurately assessed.

P-047-003

Assessing the environmental, social and land use impacts of the Columbia River Crossing project depends on accurate estimates of future traffic levels. The FEIS purports to offer very detailed estimates of traffic flows across the I-5 bridge and related roadways, through the year 2030.

The traffic and toll revenue forecasts prepared for the Columbia River Crossing are not accurate. The original forecasts were prepared based on 2005 base year data, and were published in 2007, and incorporated in the May 2008, Draft Environmental Impact Statement. The language in the FEIS and DEIS is virtually identical in many cases. The Columbia River Crossing has not produced new forecasts of travel since that time.

P-047-003

This comment has four main elements, each addressed below.

“Actual traffic data show that CRC traffic projections are wrong.”

The methodology used for the CRC project is based on regional growth plans and uses the same models used for all transportation projects undertaken for the Portland-Vancouver region. CRC did not assume uniform growth of traffic from year to year. Estimating future traffic volumes requires a dynamic model with inputs on land use, socioeconomics, trip origins and destinations, and travel mode and route choice. The traffic forecasts used for the CRC project are based on the regional transportation forecasting model developed and operated by Metro and the Southwest Washington Regional Transportation Council (RTC). A multi-jurisdictional team, including all the local partners, has reviewed CRC traffic modeling forecasts. In addition, an independent review panel composed of national experts in the field of traffic modeling conducted an independent analysis in 2008 and validated the methods and results. The panel found that the travel demand model used for CRC is an advanced trip-based tool and that it was a valid tool for a project of this type.

See also the January 21, 2011 memorandum from ODOT Director Matt Garrett to members of the Oregon legislature.This memo responds to comments that Mr. Chris Gerard sent to members of the Oregon legislature in October 2010. Memo is located on CRC website at: http://www.columbiarivercrossing.org/FileLibrary/Memorandums/PlaidPantry_Response.pdf

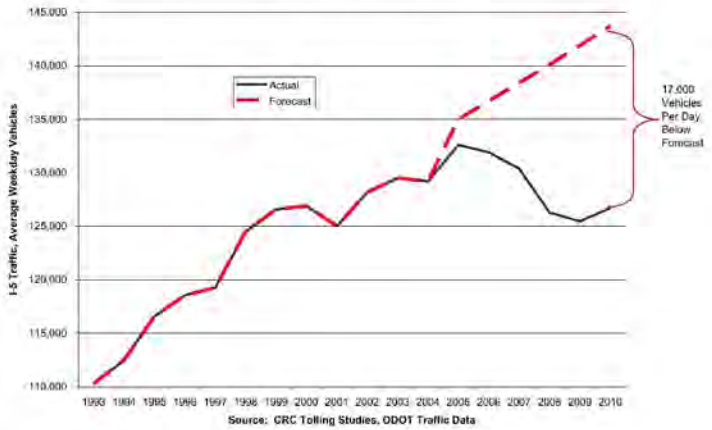
“Independent review confirmed flaws in CRC traffic forecasts”

The Oregon Treasurer contracted with two independent transportation specialists to review the traffic forecasts used for the EIS, from the

P-047-003

Actual traffic data show that CRC traffic projections are wrong. The CRC projections are that traffic on the I-5 bridges should have reached 143,700 vehicles per day in 2010. Actual traffic levels were 126,700 vehicles per day in 2010, 17,000 vehicles per day below the CRC forecast. These figures are based on our analysis of ODOT's data on traffic levels on I-5, through November 2010.

CRC Forecast v. Actual



In addition, the question is not merely whether traffic is increasing again now, but whether they will recover to the previous levels, and whether they will grow at anything close to the rate CRC projected in the DEIS. The evidence shows the growth rate is much slower than forecast, raising serious questions about the project's financial viability.

The Treasurer's independent review of the traffic forecasts confirmed the flaws in CRC traffic forecasts. In 2011, the Oregon State Treasurer retained Robert Bain of RB Consult to review the CRC finance plan and traffic projections. Bain concluded that:

- Traffic and revenue analyses prepare for the CRC were unsuitable for credit analysis
- CRC traffic projections were confusing and outdated
- Authors of the traffic projections failed to examine historical data or verify their models against actual trends

perspective of how they would be used for revenue forecasting. These independent reviews did not evaluate the suitability of the traffic forecasts for NEPA purposes. The RB Consult report includes the following statement regarding the intent of their review, "… the (CRC traffic forecast) reports to date have been prepared primarily to feed into an Environmental Impact Statement process. Others will be better placed to comment on their suitability in that particular context." [1] This statement clarifies that RB Consult did not review the traffic forecasting for its use in NEPA, nor did they consider themselves in a suitable position to provide such a review. Their comments to the Oregon Treasurer were in the context of revenue forecasting, and those comments were addressed by the project in the financial chapter of the FEIS (Chapter 4).

The other report: "Desktop Review of Traffic and Toll Revenue Forecasts" by C&M Associates, Inc. dated June 2011 provides additional perspective. C&M Associates' report explains the differences between the forecasting performed in support of the environmental process and the the future "investment grade" analysis. C&M states "the Desktop Review Team of C&M Associates, Inc. concurred with the statement of the Traffic and Revenue Study in that the purpose of the DEIS documents were to develop traffic forecasts for environmental assessment purposes." Also, C&M states "Based on peer reviews of the work to date and based on the initial review of the documents, the approach appears sound and reasonable for the purposes of the DEIS. The documents show a high level of scrutiny by peer review panels and a high level of coordination among project stakeholders during the DEIS process."[2] Another statement in the C&M Associates' report supports the adequacy of the approach used for the CRC project. The report states, "For the purposes of the DEIS, the generalized cost approach in the travel demand model with the post-processing utilizing VISSIM micro-simulation appears adequate for the forecast of traffic and revenues." [2]

P-047-003

- Diversion estimates to I-205 were "worrying."
- Overall, the CRC appears to have overestimated traffic.
- Toll revenue appears to be over-estimated by 25 percent.

(Bain 2011)

"Both ODOT and CRC consultants have concluded the models used to estimate CRC traffic do not produce valid, accurate estimates of traffic for tolled facilities."

This comment is based on a misunderstanding of the Tolling White Paper 3: Travel Demand Model Sufficiency. This white paper provided some useful suggestions, but it was developed to assess all of the transportation demand models currently used in the state of Oregon. This larger scale assessment provides comments about all models used throughout the state; not all statements are directed at Metro's model.

The white paper had several recommendations to improve modeling, some of which have already been implemented for the CRC project. The recommendations implemented include the CRC project team's use of Metro's Metroscope tool for assessing land use impacts and the VISSIM traffic simulation tool used for corridor analysis. In addition, the project conducted a stated preference survey to help assess the impact of imposing a toll on I-5. The fact that Metroscope and VISSIM have been used specifically for the CRC project and the data obtained from the stated preference survey addresses some of the alleged short-comings of the transportation demand model if it were used alone. This white paper also does not account for the detailed post-processing that was done by CRC. This step involves adjusting the raw transportation demand model outputs for the future to account for the imperfect match between model outputs and actual traffic volumes in the base year condition. This necessary and critical step helps increase the validity of corridor volumes. The post-processing procedures used for the CRC project are consistent with the National Cooperative Highway Research Program (NCHRP) Report 255 – Highway Traffic Data for Urbanized Area Project Planning and Design published by the National Academy of Science's Transportation Research Board.

P-047-003

Both ODOT and CRC consultants have concluded that the models used to estimate CRC traffic do not produce valid, accurate estimates of traffic for tolled facilities. In February 2009, the Oregon Department of Transportation received a report prepared by Parsons Brinckerhoff, David Evans and Associates Inc., and Stantec Consulting Services Inc. The authors of this report all happen to be contractors for the Columbia River Crossing project. The report is entitled *Tolling White Paper 3: Travel Demand Model Sufficiency*. This document is available on the Internet at the following address: http://www.oregon.gov/ODOT/TD/TP/docs/LRPU/twp3.pdf

ODOT's report finds that the current models used to forecast traffic in Oregon, and specifically in the Portland Metropolitan Area, including the Metro model, are inadequate to accurately predict traffic volumes on tolled facilities, such as the proposed Columbia River Crossing. Consider ODOT's summary of this report:

> Existing models in Oregon are rated as excellent for the purposes they were designed, and some are internationally recognized. However, Oregon models have not been specifically designed to evaluate toll projects, so **planners are not able to confidently forecast travel patterns for projects that are considering tolling/pricing. Existing models are not able to determine how travelers would change their mode, route, travel time, or destination in response to tolling/pricing.**
> Oregon Department of Transportation, Tolling and Travel Demand Model Sufficiency, Highlights of Tolling White Paper 3, March 2009, page 1, http://www.oregon.gov/ODOT/TD/TP/docs/LRPU/Highlight3.pdf#Tolling_White_Paper_3
> (Emphasis added)

As the ODOT study shows, the Oregon Department of Transportation and the principal contractors for the Columbia River Crossing concur that the traffic forecasting methods used by the CRC are not accurate or reliable. Accurate estimates of future traffic levels are central to assessing the need for this project, justifying its size, evaluating its environmental impacts, and most crucially, determining the viability of its financial plan.

The recession does not explain the decline in I-5 traffic, and in any case, CRC has not revised its traffic projections or impact analysis to reflect the much slower rate of growth. It has been claimed that the decline in traffic since 2005 is attributable to the economic recession which began in December 2007. The current staff report alludes to this same argument, claiming that the traffic projections and financial documents need to be "recalibrated to reflect stalled economic growth." (Staff report, PDF page 30). Robert Bain, the consultant to the Oregon State Treasurer conclusively disposed of this argument in his report:

> Traffic volumes using the I-5 Bridge have flattened-off over the last 15-20 years; well before the current recessionary period. This is highlighted by the red dotted

The Oregon Modeling Steering Committee (OMSC) provided a more detailed response to the Tolling White Paper 3, refuting a number of the details of the paper and its conclusions (http://www.oregon.gov/ODOT/TD/TP/docs/LRPU/Report.pdf).

"CRC has not revised its traffic projections to reflect the much slower rate of growth."

Traffic forecasts are not based simply on projecting recent trends, but on developing future forecasts of transportation use based on other variables including population and employment forecasts. Metro's transportation demand model relies on the adopted land use plans of the region's cities and counties including the areas identified for residential, commercial, and industrial development. The approach used to develop traffic volume forecasts for the EIS is summarized on page 3-27 of the FEIS and is detailed in the CRC Traffic Technical Report. In its July 27, 2010 report, the Independent Review Panel expressed concerns that too much focus on the 2030 planning horizon could lead to undersizing the bridge. The IRP commented "The desirability of living in the Portland/Vancouver region is not going to diminish, so populations will continue to grow…. [T]he IRP believes the greatest risk in the decision-making process is not over-sizing the bridges but not building enough capacity for the next 100 years." As noted in the FEIS (page 3-27), it is important to remember that a delay in meeting the 20 year traffic forecasts would have little meaningful effect on the design of a facility intended to serve long-term needs and to last for many decades.

[1] Bain, Robert. (2011). Columbia River Crossing Review of Traffic & Revenue Reports and Related Material, Summary Report, RBConsult Ltd., London, 4 July 2011.

[2] Vargas, Herbert. (2011) Columbia River Crossing Desktop Review of

P-047-003

trend line in the chart below which was estimated up to and including the year 2006 (i.e. it omits the recent 2007 – 2010 period characterised by fuel price hikes and economic recession). The clear inference is that the flattening-off is a long-term traffic trend; not simply a manifestation of recent circumstances. (Bain 2011, page 3)

And even though CRC financial plans now concede that DEIS projections are wrong, the traffic estimates in the FEIS—which form the basis of the claims about the project's environmental, social, traffic and economic impacts—have not been revised to reflect this new reality—they are essentially the same traffic figures given in the DEIS.

Most of the impact analysis in the FEIS is based, directly or indirectly, on comparisons of traffic levels between the no-build alternative and the proposed project, and these traffic level estimates are drawn from data that has been shown to be wrong, from models that are not even designed forecast traffic for tolled facilities like the CRC, and which have not been updated to reflect the acknowledged changes that have occurred since the DEIS was published. Consequently, the FEIS does not constitute a fair and reasonable analysis or disclosure of the environmental, social, and economic impacts of the CRC.

3. The FEIS fails to meet US DOT's own requirement that funding be reasonably available in the region's fiscally constrained transportation plan.

P-047-004

U.S. DOT policy requires that US DOT not approve a Final Environmental Impact Statement for any project for which reasonably available funding has not been identified in the region's approved fiscally constrained transportation plan. The US DOT's transportation planning requirements provide:

Table 2. Fiscal Constraint Requirement before Approving the NEPA Decision

Before a Final Environmental Decision (ROD, FONSI, CE) is approved in:	Fiscal Constraint must be demonstrated by:
Metropolitan Areas	• Entire Project is in the MTP • At least one subsequent phase of the Project is in the TIP (more if within TIP timeframe) • Full funding is reasonably available for the completion of the entire Project

Source: U.S. Department of Transportation, Office of Planning, Environment, and Realty, Supplement to January 28, 2008 "Transportation Planning Requirements and Their Relationship to NEPA Process Completion" February 9, 2011

Traffic and Revenue Forecasts, Final Report, C&M Associates, Inc., Dallas, June 30, 2011.

P-047-004

While US senators and members of congress, as well as federal agency officials, have expressed a variety of opinions regarding the potential for CRC to obtain different types and levels of federal funding, the current project finance plan identifies reasonably foreseeable funding sources for the completion of the project (chapter 4 of the FEIS). The CRC project is in the Metropolitan Transportation Plan (MTP), the Regional Transportation Plan (RTP) and the State Transportation Improvement Programs (STIP).

The current adopted State Transportation Improvement Programs (STIPs) for Oregon and Washington include funding for the I-5/Columbia River Crossing project. The Oregon STIP covers the years 2010 to 2013 and provides $83,854,000 from a variety of sources which is slated for preliminary engineering design. The Washington STIP covers the years 2011 to 2014 and provides a total of $52,001,000 for preliminary engineering design. The Washington STIP also includes $200,000 to fund preliminary engineering design of interim safety improvements on I-5 in the CRC project area.

The draft Oregon STIP for 2012 to 2015 is currently under development and will be adopted over the next few months. This document identifies $58,853,000 for the I-5/Columbia River Crossing project, all of which is earmarked for preliminary engineering. The Metropolitan Transportation Improvement Program (MTIP) for the Portland MPO also includes the same dollar amount for CRC and is designated for preliminary engineering.

The draft Washington STIP for 2012-2015 is currently under development and will be adopted over the next few months. This

P-047-004

Nearly all of the elements of the financial plan for the CRC are speculative or un-approved.

A cornerstone of the CRC finance plan is the claim that $400 million will be available from the federal government as a result of an earmark or other discretionary funding, over and above funding that would otherwise come to the region, because of the alleged special character of this project. (The latest version of the plan actually assumes a $500 earmark in some scenarios).

For years, CRC advocates have traded on the idea that the CRC is a special project that will get funding from "a special pot" that wouldn't otherwise be available to the region, and that it wouldn't compete for dollars that could go to other projects, like federal formula funds. For example, earlier this year, Matt Garrett, ODOT director said:

> "Federal highway funds are being sought from a category known as Projects of National Significance. Very few projects in the country and no other projects in the region can compete for these funds . . . . These sources are unique to the CRC project and do not affect other Oregon projects."

Notice in particular three things about Mr. Garrett's statements. First, the passive voice and indefinite form "funds will be sought." Second, Mr. Garrett is silent on what would happen if these discretionary funds either aren't available, or fall short of the amounts being "sought." And third, Mr. Garrett in no way rules out seeking funding for CRC from other sources.

The just released FEIS Financial Plan, however, opens the door to using funding the CRC using federal formula allocations that are available for a wide range of projects in the region and the state. The financial plan tries to downplay the likelihood that these funds will be used.

"Federal Revenue and Financing Options"

Federal Formula Funds

ODOT, WSDOT, C-TRAN, TriMet, Portland's Metro Regional Government (Metro), and the Southwest Washington Regional Transportation Council (RTC) receive transportation funding from a variety of federal formula grant programs. In an urban area, the metropolitan planning organizations (MPOs) program these funds to specific eligible uses. In the Portland-Vancouver region, this is accomplished through Metro's or RTC's Metropolitan Transportation Improvement Program (MTIP) processes. State and federal funds are also programmed in ODOT's and WSDOT's State Transportation Improvement Programs (STIPs). While federal formula funds potentially could be used for the CRC project, many of these funds are currently programmed for other uses, and the finance plan for the CRC

document identifies $38,548,000 for the I-5/Columbia River Crossing project, which is designated for right-of-way acquisition. The MTIP for the Vancouver MPO, which was adopted on October 4, 2011 by the Regional Transportation Council's Board of Directors acting as the MPO, includes the same project and dollar amount as the draft STIP.

P-047-004

project does not anticipate reprogramming of these funds.
(Final Environmental Impact Statement, Finance Plan, Section 4.3.1, page 4-7)

It is clear from this wording that there is no definitive determination of whether any funds are actually available or committed for the CRC. The wording of the FEIS Financial Plan makes it clear that everything about the plan is effectively hypothetical, and will change later.

> As stated earlier, the financial plan scenarios discussed above are illustrative of the financial tradeoffs between the alternatives. The finance plan will be refined during final design, and the final plan may differ from the scenarios discussed above.
> (Final Environmental Impact Statement, Financial Plan, page 4-18)

The current illustrative financial plan scenarios are valid if, and only if, the CRC could obtain a $400 million to $500 million earmark or discretionary allocation. That was always at best just a speculation. Recent developments in Washington DC make it clear that it is a virtual impossibility.

ODOT Director Matt Garrett conceded there was currently no evidence that there would be any such funding available as part of the transportation reauthorization process:

> We thought there might be a specific project of national significance. At least with the language we have right now, the discretionary money is not really clear where that's going to present itself.
> Matt Garret, Metro LUFO Hearing August 11, 2011

More recently, Peter DeFazio, a key legislator, whose support is vital to any federal funding, has repeatedly expressed his dismay about the size and cost of the CRC. On August 7, DeFazio told the Associated Press that the outlook for funding for the Columbia River Crossing is now "very, very, very, very grim." (Fought and Cooper 2011).

In the Oregonian on August 14, DeFazio said:

> "I kept on telling the project to keep the costs down, don't build a gold-plated project," a clearly frustrated DeFazio said. "How can you have a $4 billion project? They let the engineers loose, told them to solve all the region's infrastructure problems in one fell swoop... They need to get it all straight and come up with a viable project, a viable financing plan that can withstand a vigorous review."
> (Manning, Jeff. "Columbia River Crossing could be a casualty of the federal budget crunch", The Oregonian, August 14, 2011).

P-047-004

Later, DeFazio told Oregon Public Broadcasting:

> "I said, how can it cost three or four billion bucks to go across the Columbia River? . . . Now with the proposed Republican cuts in transportation . . . they want to cut this [transportation spending] by 35 percent, that means minimally we lose 600,000 to a million jobs and projects like this don't go forward. . . . Right now it's very problematic. . . . The Columbia River Crossing problem was thrown out to engineers, it wasn't overseen: they said solve all the problems in this twelve-mile corridor and they did it in a big engineering way, and not in an appropriate way.
> "Think Out Loud," Oregon Public Broadcasting, August 18, 2011.

Federal transportation funding faces major cutbacks. There are no earmarks or projects of national significance. As a result, CRC's funding strategy is tantamount to "bait and switch": advocates tell everyone that the federal money for the CRC will come from a "special pot" of earmarks that won't compete with other local projects, and but it should be increasingly clear that when this doesn't materialize, they will seek funding from all of the other sources of funds listed in the FEIS.

When they do, this will reduce the amount of money available for other projects in the region. Because the CRC is such a large project with a high risk of cost overruns, and because it faces revenue shortfalls from other funding sources, it would likely be a drain on the region's transportation financing capacity the next decade. Indeed, the recently released project schedule—which does not include phasing—extends the construction period to 2023. No one in the region has identified, approved, or committed funds for the construction of the CRC. Therefore, to move forward with this project would be a violation of US DOT's own policy requiring that the reasonable availability of funds for a project in a fiscally constrained plan be in place prior to approving the FEIS.

4. Historical data show that traffic levels on I-5 are declining, and prove that FEIS traffic estimates are inaccurate

P-047-005

The levels of traffic crossing the I-5 and I-205 bridges are the central issue raised by this FEIS. The need for the project is predicated on the claim that traffic levels are steadily increasing, and that additional capacity is needed. The Environmental Impact Statement's claims hinge on a comparison of predicted future traffic levels with, and without the bridge.

P-047-005

There are six needs behind the proposed CRC project. Highway congestion, which is already substantial in this section of I-5 and is projected to grow worse as the region's population increases, is among those needs, as described in Chapter 1 of the FEIS.

The traffic volume cited in the FEIS (134,000) was from a specific count conducted in October 2005 when all ramps and the mainline volumes were obtained simultaneously. The October 2005 day, which needed to be selected in advance for the major traffic counting effort, was within one percent of the average weekday traffic volume for the entire year. Average weekday volumes for August 2005 exceeded 140,000. Traffic volumes do fluctuate and decreased between 2006 and 2009. Traffic volumes obtained from the Oregon Department of Transportation's automatic traffic recorder (ATR) monitoring sites show that traffic volumes have been increasing in since 2009. The most recent data available from ODOT's ATR sites on I-5 indicate that the AWDT for 2010 is 1.12% above the 2009 volumes. For the first six months of 2011, the ODOT data showed a 1.00% increase over 2010. During the peak hours of travel, the return to higher volumes has been even more pronounced. For example, in the northbound direction on I-5, between 3:00 pm and 7:00 pm, volumes increased by 8.6% between 2008 and 2009 and another 8.6% between 2009 and 2010. These data are from Portland State University's Portal data, the official transportation archive for the Portland-Vancouver metropolitan region, data set for MP 307.9 (the Interstate Bridge).

It's also important to put the relationship between the 2030 forecasts and the project design into perspective. Whether the population and traffic forecasts are met by 2030 or 2035 makes no meaningful difference to the design of a facility intended to last for many decades and to serve long-term needs.

P-047-005

Even though traffic is at the heart of the need for this project, and is central to evaluating and disclosing its environmental impacts, the FEIS contains a paucity of actual data on traffic levels. The baseline traffic levels reported in the FEIS are purported to represent 2005 "base year" conditions.

The FEIS contains no actual data on current traffic levels over the I-5 bridges. The most recent data are from 2005.

According to the FEIS, the levels of reported traffic in 2005 was 134,000 vehicles per day. That figure is, in fact, not accurate. According to ODOT's published data, traffic in 2005 was 132,600 vehicles per day. If the FEIS does not even contain correct data about so-called "base year" traffic six years ago, how can anyone put any faith in the project's projections of traffic levels two decades hence?

We are a significant way (more than 20 percent) through the forecast period, and the FEIS contains no information that would enable one to validate the estimates contained in traffic projections. Actual data on traffic levels over the I-5 and I-205 bridges between 2005 and 2011 are omitted from the FEIS. The FEIS actually contains no historical time series data on traffic levels.

The CRC predicts sustained rapid growth in the no-build scenario, but has done nothing to validate its predictions, even though we have six years of actual experience since the base year of their projections. The base year for the forecasts of future traffic for the Columbia River Crossing is 2005, with a stated level of 134,000 vehicles per day. The CRC forecasts that traffic in the no-build scenario on the I-5 bridges will be 184,000 vehicles per day in 2030.

We now have nearly six years of experience—more 20 percent of the planning period--since the base year of the CRC traffic forecasts. CRC has done nothing to test whether their estimates have been borne out by actual experience.

The Oregon and Washington Departments of Transportation collect data that track the average level of traffic volumes on I-5 across the Columbia River. These data are reported by the Southwest Washington Regional Transportation Council. Data are from the council website: http://www.rtc.wa.gov/data/traffic/brdgawd.asp "Columbia River Bridges." The following table shows average annual traffic over the I-5 Columbia River Bridges for the past 15 years. It also displays the annual growth rate of traffic each year, compared to the preceding year, and the average annual growth rate for three five-year periods.

P-047-005

Average Daily Traffic, I-5 Bridges,

Year	Average Daily Traffic	Annual Growth Rate
1994	112,988	
1995	116,589	3.2%
1996	118,558	1.7%
1997	120,644	1.8%
1998	124,516	3.2%
1999	126,589	1.7%
2000	126,903	0.2%
2001	125,652	-1.0%
2002	128,162	2.0%
2003	129,657	1.2%
2004	130,279	0.5%
2005	132,603	1.8%
2006	131,916	-0.5%
2007	130,389	-1.2%
2008	126,278	-3.2%
2009	125,436	-0.7%
Annual Average Growth (Five-year Periods)		
1994-1999		2.3%
1999-2004		0.6%
2004-2009		-0.8%

This data shows several key trends. First, for the past four years, average traffic levels on the I-5 bridges have been declining, not increasing. Second, the growth rate in traffic on the I-5 bridges has been decelerating for the entire period shown in this table. Growth rates averaged 2.3 percent per year during the late 1990s, only 0.6 percent per year in the next five-year period through 2004, and traffic decreased at an average rate of 0.8 percent per year for the past five years. Third, the slowdown in traffic growth rates and the annual decline in traffic clearly preceded the recession that began in December 2007.

It is apparent that the baseline forecast for growth of I-5 traffic included in the Final Environmental Impact Statement assumed a very dramatic acceleration in traffic growth from historical trends. To grow from a 2005 level estimated at 134,000 to a projected 2030 level of 184,000 in the FEIS base case, I-5 traffic would need to increase 1.3 percent per year over the 25-year period, 2005 to 2030. That would require more than doubling the rate of growth actually observed in the 1999-2004 period (0.6 percent). And as illustrated above, the historical data show that the rate of traffic increase has been decelerating (and now declining) and not increasing, as forecast in the FEIS. The FEIS and the traffic projections offer no explanation as to why the rate of increase of traffic should more than double from this long term trend.

P-047-005

Figure 1 shows the actual level of traffic reported by the Regional Planning Council (from the table above), and the forecast level of traffic growth required to achieve the 2030 projection of 184,000 vehicles per day. The actual level of traffic recorded in 2009 was roughly 14,000 vehicles less than the more than 140,000 vehicles per day implied by the CRC traffic forecasts. Whereas the CRC forecast implied that traffic over the I-5 bridges (in the no build scenario) would increase by almost 7,000 vehicles per day; in reality, the number of vehicles crossing the bridge declined by 7,000.

Figure 1: I-5 Bridge Traffic: Actual v. Predicted

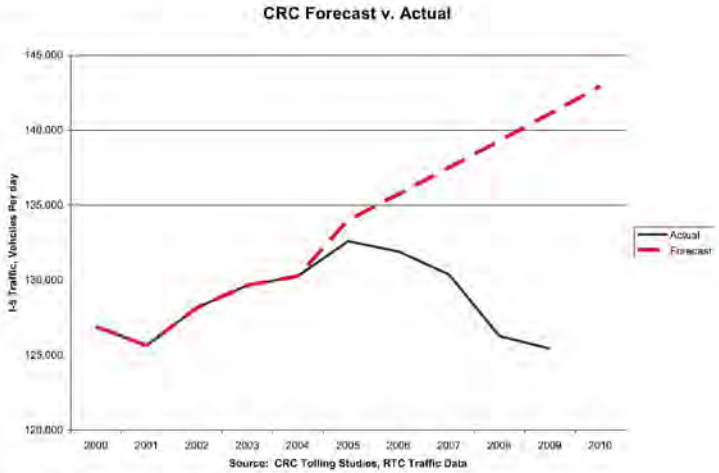
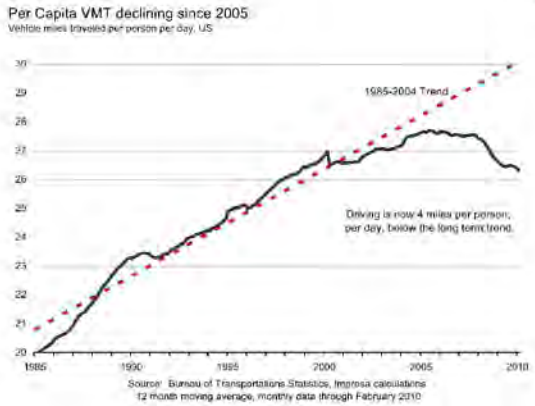


Figure 2: National Trends in Vehicle Miles Traveled

P-047-005



As Figure 2 makes clear, travel demand estimates based on pre-2005 trends are very likely to overestimate travel demand growth. Following the big increase in gas prices after 2004, American citizens began driving less. That trend has persisted over the past five years.

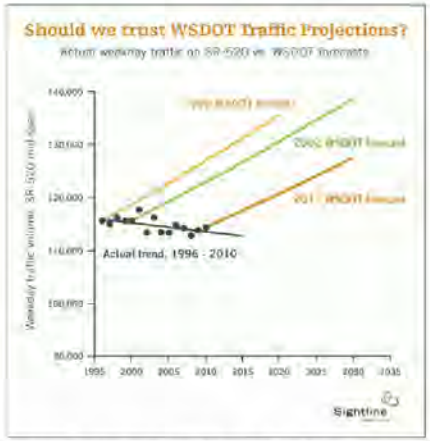
It might be argued that the past four years of declining traffic are a temporary aberration, and that in the longer term, forecast growth will make up for these declines. This is unlikely to be true for three reasons. First, as noted above, the trend has been for a decelerating rate of growth over the past 15 years. Second, as discussed below, changes in gas prices and consumer behavior that are very long term in nature are behind the decline in CRC traffic. And third, the departure from forecast experienced so far means it is likely impossible to make up the shortfall over the remaining time in the forecast period. In order to reach the expected No-Build 2030 traffic volumes of 184,000 from the actual 2009 level of traffic, traffic would have to increase by 1.85 percent per year for each of the next 20 years. That is a growth rate about forty percent faster than the 1.30 percent forecast in the DEIS, and two and a half times faster than the 0.7 percent growth rate actually observed over the fifteen year period 1994 to 2009. The CRC project materials provide no basis for believing such a dramatic increase in driving will occur.

The tendency to overestimate future traffic levels in mature travel corridors is also apparently an endemic problem with the current methodology used to predict future transportation demand. After a careful review of the literature, the Government Accountability Office found:

P-047-005

> . . . current travel demand models tend to predict unreasonably bad conditions in the absence of a proposed highway or transit investment. Travel forecasting, as previously discussed, does not contend well with land-use changes or effects on nearby roads or other transportation alternatives that result from transportation improvements or growing congestion. Before conditions get as bad as they are forecasted, people make other changes, such as residence or employment changes to avoid the excessive travel costs.
> (Government Accountability Office, 2005)

This pattern—of overestimating future growth is a regular and repeated characteristic of the models used by the sponsoring agencies. For example, consider the Washington Department of Transportation's models of traffic levels on the 520 Floating Bridge in the Seattle area. They invariably predict increasing levels of traffic—which are not realized in practice. In fact, rather than increasing, traffic levels have generally declined.



Source: Williams-Derry, 2011 "WSDOT vs. Reality" www.sightline.com

The weakness of transportation models in accurately predicting future traffic levels is a continuing problem. So it is not merely the CRC traffic projection model that is problematic; rather the entire class of four-step (trip generation, assignment, mode, routing models) have proved inaccurate in practice. After an exhaustive review of the state of the art, the Transportation Research Board of the National Academies wrote:

P-047-005

> "In 2005, as has been true for the past four decades, these models could not provide accurate information to inform decision making on many transportation and land use policies or traffic operation projects."
> (Committee for Determination of the State of the Practice in Metropolitan Area Travel Forecasting, 2007)

While technology has allowed for faster computation, and more detailed mapping, they conclude:

> "The practice of metropolitan travel forecasting has been resistant to fundamental change. Every 10 years or so there begins a cycle of research, innovation, resolve to put innovation into practice, and eventual failure to affect any appreciable change in how travel forecasting is practiced."
> (Committee for Determination of the State of the Practice in Metropolitan Area Travel Forecasting, 2007) pages 123-124.

This FEIS document is predicated on the belief that models and their results somehow trump reality. Traffic levels across the I-5 bridges have never been as high as asserted in the base case (2005) modeling for the FEIS. And they are not increasing, nor increasing at a rate more than double any time during the past twenty years, they are in fact declining. There are serious reasons to doubt the reliability of these models, especially given the dramatic changes in gas prices, and observable, non-transitory changes in travel behavior. It is especially egregious that the FEIS omits any presentation of actual trend data on traffic levels, and instead relies entirely on its own unverified models. As a result, the FEIS is not a factual or scientific document: it is a fairy-tale. Such a document cannot possibly be construed to comply with the requirements of the National Environmental Policy Act.

5. An "Investment-grade traffic forecast" would show substantially different traffic and pollution effects

P-047-006

CRC has not prepared an investment-grade forecast. Investment grade forecasts use more realistic assumptions about travel behavior on tolled facilities. While in public statements, CRC officials have claimed that the investment grade forecast is a mere "refinement" of the forecasts contained in the FEIS, that is untrue. The investment grade forecasts show that traffic may be much more sensitive to tolls that allowed for in the FEIS models. For example, the Investment Grade Forecast prepared for the Washington State Department of Transportation showed that traffic levels on the 520 Floating Bridge would fall by almost half when tolls were introduced, because drivers would shift to the parallel and un-tolled I-90 bridge. (Wilbur Smith & Associates, Wilbur Smith Associates, "SR 520 Bridge Investment Grade Traffic and Revenue Study," Washington

P-047-006

There are a variety of modeling and forecasting tools and each has its particular uses, functions and limitations. The federal, state and local CRC partners fully recognize that an "investment grade" traffic forecast will need to be made at the appropriate time, for a particular purpose.

Investment grade forecasting has a particular purpose – primarily to manage financial risk associated with repayment of bonds through toll revenues. This differs from the travel demand forecasting that is done for the purposes of planning and designing a facility. This latter type of modeling is intended primarily to understand how the alternatives would be likely to affect transportation system operations and related environmental impacts. It is used to help determine the size and character of the project, and to understand its impacts. Neither type of modeling can be said to be more accurate than the other. Each type has its own primary purpose and function. See the response to Mr. Cortright's previous comment regarding independent review of the traffic forecasts. That response includes an explanation of the difference in purpose of investment grade forecasting versus NEPA forecasting, as quoted from the C&M report.

P-047-006

State Department of Transportation, August 29, 2011, http://www.wsdot.wa.gov/NR/rdonlyres/A3B026EC-C9AF-4B43-BA31-4CB30FFD2CEB/0/SR520InvestmentGradeStudy.pdf.)

The situation is nearly identical for the Columbia River Crossing. While the I-5 bridge is proposed to be tolled, the parallel I-205 bridge is not. Consequently, more traffic may be diverted from I-5 to I-205, producing much higher levels of congestion than estimated in the FEIS. The failure to accurately estimate traffic effects means that the FEIS does not comply with NEPA because it doesn't reveal what the actual patterns of traffic will be under the LPA. CRC should be required to disclose the actual patterns of traffic than can be expected by undertaking an "investment grade" analysis prior as part of the NEPA review.

6. Metroscope estimates of induced demand effects are implausible and contradict FEIS travel estimates

P-047-007

The FEIS relies for validation of its minimal impacts on land use on the Metro "Metroscope" model. The results of the Metroscope model are not plausible, and are not consistent with the literature on induced demand. The Metroscope forecast predicts that the existing 6 travel lanes on the I-5 bridge would accommodate 18,067 trips in the afternoon peak in 2030 under the No-Build alternative. In contrast, the LPA is predicted without tolls--with 10 lanes of traffic—is predicted would accommodate just 18,643 trips in the two hours of the afternoon peak in 2030. There is no reasonable basis for estimating that a 66% increase in capacity (3 lanes to 5 lanes) would produce only a 3% increase in traffic over the next decade compared to the no-build.

The Metroscope model is based in part on the Metro transportation forecasting model, which the Oregon Department of Transportation and CRC consultants have determined are not capable of accurately predicting traffic on tolled facilities.

In addition, there is no evidence that the Metroscope models are consistent with, or support the traffic forecasts contained in the FEIS. The FEIS claims that automobile traffic during the PM peak hour would be 33% higher under the LPA than under the No-build (FEIS, Summary, Exhibit 18). The Metroscope model claims that automobile traffic during the PM peak hour would be 10% lower under the LPA than under the No-Build (Metroscope, Figure 3.3-1 2030 PM 2-Hour Travel Time Histograms by Alternative, page 25). Far from confirming the findings of the FEIS, the Metroscope model contradicts them. With plainly contradictory evidence that is unexplained by the FEIS, no one can reasonably assume that the FEIS accurately characterizes the environmental impacts of the LPA.

P-047-007

Metroscope's principal use for the EIS was to test the indirect or induced land use effects of the CRC project, including its added highway capacity, light rail transit, and tolling. Metroscope provides an estimated projection of how the project might indirectly affect land use (household and job location) over time. The results of various model runs are intended to be assessed against each other.

While Metroscope modeling is used to test the potential indirect land use effects from the project, it is not used to predict the project's direct effects on traffic operations, ridership or other performance metrics. Both tools start with the results of Metro's regional travel demand model but then take different steps in order to address the particular analytical questions that each is intended to answer. As a result of these different steps, the results of the volumes reported from the VISSIM model will never exactly match those of the regional travel demand model. However, the FEIS traffic demands illustrate similar patterns to the Metroscope traffic demands when comparing the No-Build and Build-with-Tolls scenarios. As for comparing the volumes shown in the FEIS, Summary, Exhibit 18 (traffic throughput) and volumes shown in Metroscope Figure 3-1.1 (traffic demand) this is an apples-to-oranges comparison. As stated on Page 3-9 of the FEIS the terms traffic demand and traffic throughput have different meanings. Traffic demand refers to the total number of motorists attempting to access the transportation system, including those caught in congestion. Traffic throughput is the total number of motorists actually able to travel through the transportation facility. When traffic demand exceeds traffic throughput, congestion occurs and some motorists are forced to take alternative routes or experience delays.

See also the response to comment P-047-010 below.

7. Projections grossly over-estimate base case traffic, and under-estimate induced demand, thereby biasing estimates and concealing the project's true environment impacts.

P-047-008

It is evident that the FEIS creates a fictitiously high level of predicted no-build traffic for two reasons. First, this creates a justification for the project. Second, it enables the project to claim that the traffic volumes created by the LPA will be less than the artificially inflated "no-build" scenario, and will therefore have fewer impacts.

8. Models fail to adjust for changing gasoline prices and dramatic shift in traffic trends.

P-047-009

The modeling for the CRC is based on 1994 vintage regional transportation surveys, and implicitly assumes that gasoline prices will be low and stable. It does not reflect the tripling of gasoline prices in the past decade or their effects on travel behavior, mode choice, and land use development patterns.

CRC traffic forecasts appear to be badly out of date, and there is no evidence that they have been adjusted to deal with current gasoline prices or development trends. The CRC traffic forecasts are poorly documented, and don't indicate what baseline data were used, what assumptions were made, and what error and uncertainty factors are associated with these estimates. It appears from the documents included in the Draft Environmental Impact Statement that traffic projections were made in 2007, based on 2005 data. The key measures of traffic activity (184,000 crossings of the I-5 bridge in the no-build, and 178,000 in the build alternatives), have remained essentially unchanged for several years. (See for example, Draft Environmental Impact Statement, Summary, Exhibit 26 Summary of Transportation Effects and Cost for Each Alternative, Page S-30). The forecast documents, including those released in 2010, use the same numbers (184,000 in the no-build, and 181,000 for the LPA) as the project has publicly quoted since the DEIS was released in 2008. The forecast documents refer to the "current year" for traffic purposes as "2005." The modeling was based on Metro's transportation model (Columbia River Crossing, 2010f). The Metro model was calibrated based on behavioral data collected in 1994 and assumes that real gasoline prices would not increase at all, i.e. that gasoline prices increase no faster than the rate of inflation (Higgins, 2008).

P-047-008

Mr. Cortright's assertion that the No-Build Alternative's traffic forecasts are overestimated and that the effect of induced demand are underestimated is addressed in responses to his other comments, above and below.

P-047-009

Metro's regional travel demand model uses the total auto operating cost (on a per-mile basis) of a vehicle as an input into the model's forecast of travel demand and resulting roadway volumes. The total auto operating cost of a motor vehicle is based upon an annual calculation made by AAA. The total operating costs include gas, oil, maintenance and tires. For future year forecasts (i.e., 2030), the model assumes that this auto operating cost per mile will rise with inflation.

Fuel costs within the Metro travel demand model are considered as part of the auto operating cost, which consists of gasoline and oil, tire, and general vehicle maintenance costs on a per mile basis. In reviewing historical data, the cost to operate a vehicle has increased almost exactly the same as the inflation rates for nearly two decades, even during times of fluctuating fuel prices. This is partly a result of consumers' responses, both in the short term and longer term. Travelers reaction options to rapidly changing fuel prices are somewhat limited in the short term, but over the long term many consumers tend shift to more fuel efficient vehicles. Changing technologies and policy actions are expected to further improve fuel efficiencies.

The Travel Demand Review Panel, which conducted its review in late 2008, assessed the project's approach with regard to vehicle operating costs. One of the specific questions asked of the Panel was "Are fuel price and vehicle operating cost assumptions used in the model reasonable?" The Panel's response was unambiguous. It states "The Panel concluded that the vehicle operating cost assumptions, of which

P-047-009

There is clear evidence that the persistently much higher level of gas prices since 2005 has produced a sea change in consumer behavior. Nationally, per capita driving has been in decline since 2004, and is now at 1999 levels.

Consumers are not only driving less, but are scrapping cars faster than they are buying new ones. Nationally, the number of vehicles in operation declined by four million in 2009 (Brown, 2010). In Oregon, vehicle registrations have declined by 30,000 compared to the previous year (Har, 2010).

The rise in gasoline prices and a growing interest in alternatives to car-dependent living has triggered a shift in housing markets within metropolitan areas. The biggest price decreases in housing and the highest foreclosure and default rates have been recorded in outlying suburban locations (Cortright, 2008).

The CRC's transportation model is based on observations made in 2005, and assumes the consumers will continue to behave as they did in 1994 (when gasoline cost $1.10 gallon). As a result CRC predicts the rate of increase of vehicle travel will be double that of the previous decade. This is highly suspect in a world where gasoline prices have more than doubled, where driving is in decline, and consumer behavior patterns are obviously changing.

A wealth of evidence shows that car ownership is declining, the number of young drivers is declining, that vehicle miles traveled are declining, and that gasoline sales are declining, both nationally and in Oregon and Washington. The FEIS contains no analysis of these trends. See for example articles by Williams-Derry, 2011.

9. FEIS claims about induced demand are incorrect and the FEIS summary of induced demand literature distorts the professional consensus.

P-047-010

The FEIS misrepresents the academic literature on induced demand and distorts the findings of its own literature review.

The FEIS report on Indirect Effects (Appendix A, page A-1) reports that the predecessor of the CRC commissioned Parsons Brinckerhoff to conduct a literature review of 75 studies of the effect of transportation facilities on demand. While the text of the report purports to summarize the findings of the report, the FEIS neither includes quotations from the actual report or the report itself. I obtained a copy of the report. Among its conclusions:

> 1.5. Households reinvest travel time savings in longer trips and more travel.

fuel costs are a component, used in the model for the primary travel demand forecasts were reasonable. The Panel confirmed that vehicle operating costs (which consists of gasoline and oil, tire, and general maintenance costs on a per mile basis) is the appropriate measure to use as it reflects the long-term relationship between fuel price and vehicle fleet fuel efficiency. In the Panel's opinion there was an adequate stratification of fuel cost, other costs and buildup of auto operating costs in the modeling process."[1]

Recent traffic count data fluctuations are discussed in other responses to Mr. Cortright's letter.

[1] Outwater, Maren. (2008) Columbia River Crossing Travel Demand Model Review Panel Report, Travel Demand Model Review Panel, Vancouver, November 25, 2008

P-047-010

The citations from the academic literature noted in the Mr. Cortright's comment do not contradict the literature referenced in the CRC FEIS. The main difference between the citations is that Mr. Cortright did not include the more detailed findings about induced demand from the academic literature as discussed in the FEIS. While some reports noted that increased highway capacity tends to have an effect on induced growth, the literature provides much more information on the specific variables that are associated with induced growth. These variables are important in evaluating the potential induced growth effects of any specific proposal, including the proposed CRC project. They are discussed in the Final EIS (pages 3-116 through 3-119) and further detailed in the CRC Indirect Effects Technical Report.

P-047-010

> Household location choice is influenced by many factors including: housing costs, access to jobs, access to goods and services, type of community, amenities/quality of life, public services/schools and property tax rates. The more numerous non-work trips for personal, family, civic, education, and recreation, may prove to be equally as significant as the work trip in housing location choice, especially for multiple worker households. Evidence suggests that households do not locate so as to minimize their travel distance from work; rather, they tend to keep their overall travel time within a certain amount, Despite differences in travel conditions and opportunities across US cities over the past 20-year, people spend the same amount of time per day, on average, in travel. The stability in commuting travel times suggests that transport accessibility improvements will allow households to locate further away from jobs, and that that any travel time savings may be used for more travel. (In the Vancouver-Portland region it may lead to household locations in outlying cities, rather than in the "rural sprawl" that typifies most other metropolitan areas.) The development shift to the suburbs in the past few decades initially reduced commute travel times as housing and jobs co-located along previously uncongested freeways. However, the increased traffic congestion of suburban areas has led to larger increases of late in suburban commute times.
>
> Parsons Brinckerhoff, Land Use-Transportation Literature Review For the I-5 Trade Corridor Regional Land Use Committee, September 17, 2001, page 12

The latest literature on induced demand—which is not addressed in the FEIS or DEIS—takes the very strong view that additional transportation capacity directly induces additional travel. One paper published by the National Bureau of Economic Research, elevates the proposition to a "fundamental law"—finding that for interstate highways in metropolitan areas distances traveled increase one for one with interstate highway lane miles. (Duranton & Turner, The Fundamental Law of Road Congestion: Evidence from US Cities, National Bureau of Economic Research, 2009, No. 15376).

Moreover, the FEIS too narrowly defines induced demand to be demand resulting from changes in land use patterns due to changes in accessibility. This is only one of several sources of induced, or generated demand. Additional transportation system capacity can cause more and longer trips even without changes in land use patterns. See for example Litman:

> Traffic congestion tends to maintain equilibrium. Congestion reaches a point at which it constrains further growth in peak-period trips. If road capacity increases, the number of peak-period trips also increases until congestion again limits further traffic growth. The additional travel is called "generated traffic." Generated traffic consists of diverted traffic (trips shifted in time, route and destination), and induced vehicle travel (shifts from other modes, longer trips and

P-047-010

new vehicle trips). Research indicates that generated traffic often fills a significant portion of capacity added to congested urban road.
Litman, Todd, Generated Traffic and Induced Travel, Implications for Transport Planning, Victoria Transport Policy Institute, 8 June 2011,

10. The results of regional travel demand models were manually adjusted by CRC advocates to shift additional traffic to I-5.

P-047-011

The models used to predict traffic are purported in the FEIS to be robust, verifiable, and scientific. But in fact, the Metro travel model is a black box, with the key factors driving predicted outcomes not accessible to outside scrutiny. In addition, the CRC officials concede having manually adjusted the outputs of the model to produce different results.

While the CRC traffic forecasts based their initial estimates on the regional transportation model, they adjusted these estimates to shift some forecast traffic from I-205 to I-5. The authors of the study labeled this manual adjustment "post-processing"—but it simply means that they used their own judgment to select higher values for I-5 than those produced by the regional transportation model. The reasonableness of this adjustment is debatable. The CRC claims that an analysis of 2005 actual traffic data shows that actual traffic on I-5 was underestimated, relative to I-205 by the regional model. The authors made no apparent attempt to see if their adjustment was supported by data in any subsequent year. But each year after 2005, traffic volumes have been proportionately higher on I-205 than I-5, undercutting the stated basis for this "post-processing" adjustment.

According to the report, the effect of the "post-processing" adjustment was to increase traffic volumes assigned to the I-5 bridges by 6 percent over the levels predicted by the regional transportation model without this modification.

The report concedes:

> However, the post processing methodology forecasts less traffic diversion from I-5 to I-205; forecasted 2030 average weekday volumes on the I-5 Bridge are about 6 percent higher with the post-processing methodology than with the regional travel demand models.
> (Columbia River Crossing, 2010b).

P-047-011

"Post processing" is the technique used to improve the results of future traffic volume forecasts by adjusting for the differences in traffic volumes between the observed base year traffic volumes and the travel demand model. Post processing is a comprehensive, systematic approach to account for the fact that the results of a traffic forecasting model, which may be highly accurate on a regional basis, may not be accurate for individual facilities, ramps, or intersections. The procedures used for the CRC project are consistent with the National Cooperative Highway Research Program (NCHRP) Report 255 – Highway Traffic Data for Urbanized Area Project Planning and Design published by the National Academy of Science's Transportation Research Board.

In its report to the Oregon State Treasury, C&M Associates commented on the traffic forecasting process. Its report states "Traffic and revenue were forecasted for a range of options considering the Metro model and a post-processing method utilizing the results of the VISSIM model that considered operational constraints." C&M Associates also explained "All the (sic) three models, the regional Metro model, the VISUM model and the VISSIM microsimulation model were validated." It should be clear that this independent, outside expert found the methods to be appropriate and that accepted techniques were used.

P-047-011

The effect of this adjustment is to understate the amount of diversion that will occur to I-205, even with the relatively high value of time estimates used in the travel demand model.

Despite its technical sounding name "post-processing" really represents a judgment on the part of the CRC to disregard the outputs of the Metro travel demand model, and to manually choose the values for traffic.

11. CRC has failed to disclose visual impacts.

P-047-012

The Columbia River Crossing will have an enormous impact on the views from downtown Vancouver and on Hayden Island. The project will cross the river approximately 70 to 80 feet in the air, and touch down up to a quarter mile away. Almost nothing in the Final Environmental Impact Statement reveals how this massive structure will affect the views and light of human beings standing on the ground anywhere near the structure.

The project's visual impact technical report contains only a handful of computer simulated images of the bridge. Nearly all of them are taken from distant points floating in the air (where no human being will ever actually perceive the structure). For example, Figure 4-8 shows the bridge from a point somewhere along Hayden Island riverfront, several hundred feet east of the bridge, using a "wide angle" perspective that diminishes the perceived height of the structure. Figure 4-12 shows the bridge from a point hovering several hundred feet above downtown Vancouver. Figure 4-13 shows a portion of the structure relatively close up, but again, from the perspective of someone floating somewhere in the air, and not on the ground. Figure 4-13 also depicts the now discarded open-web design, rather than the truss currently proposed.

The decision to present such a limited and artificial set of perspectives represents a conscious attempt on the part of the sponsoring agencies to conceal the project's visual impacts. It is a decades-old gambit: Robert Moses used the same scheme to try to sell a proposed Brooklyn-Battery Bridge in the 1930s. He concealed the fact that the bridge would have obliterated views from the ground (and the lower ten stories of buildings) in Lower Manhattan, by showing the bridge as it might be viewed, in the words of Robert Caro "by a high flying and myopic pigeon." (Caro, Robert. 1976. The Power Broker. Page 464). It was exactly this kind of chicanery that NEPA was designed to prevent.

Under NEPA, the sponsoring agencies have an affirmative responsibility to disclose the impacts the project will have on the environment, including the viewshed. The presented FEIS not only fails to do so, but presents evidence that conceals and distorts the bridge's visual impacts. As such, the FEIS fails to comply with NEPA, and the agencies should

P-047-012

The project has followed current guidance and methods for assessing visual impacts. The visual analysis is described in detail in the CRC Visual and Aesthetics Technical Report. These methods were approved by the local, state, and federal sponsoring agencies. Though there are not many computer simulations in the FEIS, the analysis is based on not just simulations but also plan and profile drawings, photographs, view corridors and view sheds. These all contribute to understanding and considering visual impacts, and they are referenced or included in the FEIS. These means were sufficient for the public and decision makers to select a locally preferred alternative including bridge type. As the project enters final design, there will be continued effort to engage the community in design and aesthetic issues. The project will be charged with maximizing the aesthetic opportunities with the composite truss bridge. This will include developing new simulated views to inform the decisions to be made during final design.

P-047-012 be directed to present a fair and accurate set of renderings disclosing the visual impact as it will be perceived by humans standing on the ground near the structure.

12. Despite making major changes to the project, the CRC did not undertake a supplemental environmental impact statement, as required by NEPA.

P-047-013 The FEIS claims:

> Both agencies concluded from these determinations that these changes and new information would not result in any new significant environmental impacts that were not previously considered in the DEIS. These changes in impacts are described in Appendix O of this FEIS. (FEIS, page 2-86.)

The implication is that the standard is "new significant environmental impacts." But this is not the standard that triggers the need for a supplemental environmental impact statement. The standard is whether there are significant changes to the project.

The project is changed is from the project described in the DEIS in several ways: The footprint on Hayden Island is significantly different. An arterial bridge is being built to Hayden Island. The bridge will be a composite truss, not an open-web. The number of lanes on the bridge will be different. At least one of the garages in downtown Vancouver is proposed to be built partially underground, and not entirely above ground as in the DEIS. The size of the Clark College park and ride lot has been more than doubled. Moreover, because the project is likely to be phased, and there is no certainty as to which phases will actually ever be completed, the project as completed may be very different than the one described in the FEIS, with different environmental impacts.

CRC proponents have implied that the full build FEIS represents the envelope of maximum impacts, and that any smaller project would have lesser impacts, but that is not correct. Some aspects of the project have environmental benefits (tolling, transit), and others have negative environmental effects. Implementing just a portion of the project would likely divert traffic to different locations, with different effects. Prior to issuing a record of decision, DOT should prepare an FEIS that reflects the actual project proposed to be built, and not one that may include many components or features that may never be constructed.

The sponsoring agencies cannot know whether there are "significant impacts" from these changes without undertaking a supplemental environmental impact statement. Moreover,

P-047-013

The test of whether or not a supplemental DEIS is required is not whether or not there have been changes to project. Revisions after the DEIS are common. The CEQ NEPA regulations (40 CFR 1500) describe two basic situations in which agencies are required to prepare a supplemental EIS:

"Agencies shall prepare supplements to either draft or final environmental impact statements if:

- *The agency makes substantial changes in the proposed action that are relevant to environmental concerns;*
- *There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts." (1502.9(c)(1))*

Applying this to FTA and FHWA projects is further clarified in Title 23, Part 771 of the United States Code of Federal Regulations:

(a) … An EIS shall be supplemented whenever the Administration determines that:

(1) Changes to the proposed action would result in significant environmental impacts that were not evaluated in the EIS; or

(2) New information or circumstances relevant to environmental concerns and bearing on the proposed action or its impacts would result in significant environmental impacts not evaluated in the EIS. (23 CFR S 771.130)

The design refinements made after the DEIS were considered and reviewed by FTA and FHWA, consistent with 40 CFR 1502.9(c)(1) and

P-047-013

the objectives of NEPA—giving the public the opportunity to review and comment on this analysis of impacts—is thwarted if the sponsoring agency is allowed to make substantial changes to a project after the DEIS.

The DOT claim that these changes don't cause significant impacts, is in fact, not the appropriate legal standard for determining whether a supplemental EIS should be prepared. The standard, according to the Council on Environmental Quality, is whether the project is substantially different than proposed in the DEIS. CEQ NEPA regulations (40 CFR 1500) describe two basic situations in which agencies are required to prepare a supplemental EIS, one of them is that:

> "Agencies shall prepare supplements to either draft or final environmental impact statements if:
> o The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or ***

Conclusion

P-047-014

The purpose of the National Environmental Policy Act is to assure citizens that all of the important economic, social, and environmental impacts of investment and policy decisions are carefully assessed and fully disclosed *before* the decisions are made. The version of the Final Environmental Impact Statement before you today falls far short of meeting that standard. Because of acknowledged funding uncertainties, and an abject failure to develop a phasing plan that everyone acknowledges will be needed, you really have no idea what project will actually be built, and therefore no way to assess its impacts. The project's traffic projections—which are utterly central to most of the key claims about the project's environmental, energy, social and traffic effects—are not only simply and demonstrably wrong, they are based on a model that the project's sponsors and consultants have acknowledged is incapable of accurately predicting traffic levels on tolled facilities. And despite acknowledging that their projections are wrong, CRC advocates have made essentially no changes to the traffic figures presented years ago in the DEIS. Finally, it is apparent the prospects for a massive $400 million to $500 million earmark for this project, which were always at best speculative, are now virtually impossible. The financial element of the FEIS is not even available in final form, and even then it not really a plan, but rather an "illustrative scenario"—as the project sponsors concede in a candid moment.

The Columbia River Crossing Final Environmental Impact Statement fails to accurately assess these important impacts and disclose their consequences to the people of the region. The U.S. Department of Transportation and its constituent agencies should reject

23 CFR 771.130(a). See discussion on page 2-86 and Appendix O of the FEIS. None of the project refinements made after the DEIS would result in new significant environmental impacts that were not previously evaluated in the DEIS.

P-047-014

Mr. Cortright's conclusion is a summarized restatement of some of the detailed comments in the body of his letter. Please see the responses above to these comments.

P-047-014 this Environmental Impact Statement, refrain from undertaking a Record of Decision, and insist that these issues be addressed.

Very truly yours,



Joseph Cortright

Attached files provided electronically are an integral part of these comments.

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P-047-014

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P-047-014

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Supplement to January 28, 2008 "Transportation Planning Requirements and Their Relationship to NEPA Process Completion" February 9, 2011

Background

P-047-014

The Office of Planning, Environment, and Realty issued an informational memorandum on January 28, 2008, explaining the relationship between certain Transportation Planning and Air Quality Conformity regulations and the timing of a final NEPA decision (Record of Decision (ROD), Finding of No Significant Impact (FONSI), or Categorical Exclusion (CE)). However, in clarifying the requirements, additional questions arose from the field after the memorandum's release. In response to the questions, this document clarifies and simplifies information on what transportation planning requirements must be addressed before FHWA can make a final National Environmental Policy Act (NEPA) decision.

A project must meet various planning and NEPA requirements. The procedures of the different requirements, direct the project sponsors to meet all the following:

- All Projects requiring Federal action or that are to be implemented with Federal-aid must come from a fiscally constrained Metropolitan Transportation Plan (MTP) and Transportation Improvement Program (TIP) or from a fiscally constrained Statewide Transportation Planning Program (STIP) [23 CFR Part 450].
- The TIP and STIP shall include a project or a phase of a project, only if full funding can reasonably be anticipated to be available for the period contemplated for completion of the project. [23 U.S.C. § 135(g)(4)(E) and § 134(j)(3)(D)].
- NEPA project approval can only be given when the NEPA documents meet all applicable environmental laws and Executive Orders or reasonable assurances of compliance are provided in accordance with 23 CFR § 771.133.
- In air quality nonattainment and maintenance areas, additional Clean Air Act and EPA requirements apply. [42 U.S.C. § 7506(c) and 40 CFR Part 93]. See Questions 25-27 for more information.

Requirements

The purpose of this document is to identify primary terminology, promote consistency, and to better explain the requirements discussed in this section. The definitions are reflected below in Table 1 and also in the Glossary.

Before the FHWA [1] can sign the final NEPA decision (i.e., ROD, FONSI, or CE), the proposed Project ("Project") as defined in the NEPA document must meet the following specific criteria:

- **For Metropolitan Planning Areas (within a MPO):**
  - The Project or phases of the Project within the time horizon of the MTP must be included in the fiscally constrained MTP, and other phases of the Project and the associated costs beyond the MTP horizon must be referenced in the Plan.

[1] For those States that have programmatic agreements with FHWA, all of the requirements in this section apply.

P-047-014

Table 1. Terms and Definitions

Terms	Definition
Project *(capital P)*	In this document, the term "Project" (*capital P*) refers to a specific proposed facility or other action as defined in the NEPA document (e.g., a bridge or a new highway) and includes every "phase of a Project", from Highway Planning and Research, Preliminary Engineering, Right-Of-Way (ROW) acquisition, through Construction.
project *(small p)*	The term "project" (*small p*) is used here as a reference to a phase of a Project, or a component of such a phase (e.g., bridge piers or highway landscaping related to a Project).
Fiscal Constraint	The MTP, TIP and the STIP have sufficient financial information for demonstration that a Project in the MTP, TIP and STIP can be implemented using committed, available, or reasonably available revenue resources.
Available Funds	Funds derived from existing sources dedicated to or historically used for transportation purposes. For example, apportioned/authorized Federal-aid dollars or toll revenues for the next 2- 4 years. [23 CFR § 450.104]
Committed Funds	Funds that have been dedicated or obligated for transportation purposes. For example, funds obligated for a Federal-aid Project or toll revenues for the next 2 years. [23 CFR § 450.104]
Reasonably Available	The term "reasonably available" in this guidance is synonymous with "reasonably anticipated to be available" and "reasonably expected to be available". Determining whether a future funding source is "reasonably available" requires a judgment decision. Two important considerations in determining whether an assumption is "reasonable" are (a) evidence of review and support of the new revenue assumption by State and local officials and (b) documentation of the rationale and procedural steps to be taken with milestone dates for securing the funds. For example, a new tax for transportation purposes requiring local and/or State legislation and/or support from the Governor is reasonable if there is clear evidence of sufficient support (both governmental and public) to enact the new tax, and a strategy exists for securing those approvals within the time period for implementing specific projects.

- The Project or phase of the Project must be in the fiscally constrained TIP, which includes:
  - At least one subsequent Project phase, or the description of the next Project phase for information purposes only in unusual instances[2].
  - All Federal-aid Projects or Project phases and State/locally funded, regionally significant projects that require a Federal action. [23 CFR § 450.324(d)]
  - Full funding is reasonably available for the completion of all the phase(s) of the Project within the time period anticipated for completion of the Project.[3] [23 CFR § 450.324(h)-(i)]

[2] "Unusual instances" may include anticipated lengthy permitting delays (such as § 404) or likely Project litigation. Please refer to Question 15 for more information.

[3] "The term "phase of a Project" refers to activities such as design, acquisition of right-of-way, and construction. For a discussion of the distinction between "phase of a Project" and "phased Projects", see Question 22. See also the definition of "Project" and "project" in Table 1 and in the Glossary.

P-047-014

- **For Non-metropolitan Areas:**
  - The Project must be consistent with the Long Range Statewide Transportation Plan (also referred to as SLRP).
  - The Project or phase of the Project must be in the fiscally constrained (STIP), which includes:
    - If the completion of the Project is beyond the timeframe of the STIP, the STIP must contain at least one subsequent Project phase, or a description of the next Project phase for informational purposes.
    - All Federal-aid projects or project phases and State/locally funded, regionally significant projects that require a Federal action [23 CFR § 450.216(h)]
    - Full funding is reasonably available for the completion of all phase(s) of the Project. [23 CFR § 450.216(l)-(m)]

Table 2 describes the fiscal constraint actions that must be in place before a final environmental decision is taken (see the attached Questions and Answers for more detail).

Table 2. Fiscal Constraint Requirement before Approving the NEPA Decision

Before a Final Environmental Decision (ROD, FONSI, CE) is approved in:	Fiscal Constraint must be demonstrated by:
Metropolitan Areas	• Entire Project is in the MTP • At least one subsequent phase of the Project is in the TIP (more if within TIP timeframe) • Full funding is reasonably available for the completion of the entire Project
Non-Metropolitan Areas (Outside MPO)	• Project is consistent with the SLRP • At least one subsequent phase of the Project is in the STIP (more if within STIP timeframe) • Full funding is reasonably available for the completion of the entire Project

3

P-047-014

Table 3 details the Federal planning and environmental requirements that must be met whether or not the environmental process is funded with Federal-aid (see the attached Questions and Answers for more detail).

Table 3. Federal-aid Eligibility and the Associated Environmental /Planning Requirements

If the Environmental process is funded with:	NEPA process can start:	Required actions before the Final Environment Decision can be approved:
Federal Funds	• Corridor/feasibility (Planning and Environment Linkages - PEL) studies: the study does **not** need to be in the fiscally constrained MTP or SLRP and can start at any time, but the study must be in the Unified Planning Work Program (UPWP) or State Planning and Research (SPR) work program when funded with Metropolitan Planning (PL)/SPR funds. If the study is using capital funds (National Highway System (NHS) and Surface Transportation Program (STP), then it needs to be identified in the UPWP or SPR work program, and/or in the TIP or STIP. • Tier I – Environmental Impact Statement (EIS) can start prior to being in the fiscally constrained MTP or SLRP if the scope is for corridor planning or feasibility study and will not include decisions directly resulting in Project implementation activities of any kind (e.g., ROW purchase)	
	• NEPA study must be in the MTP or consistent with the SLRP • NEPA phase of the Project must be in TIP or STIP	• One subsequent phase of Project is in the STIP/TIP
If the Environmental process is funded with:	**Environmental process can start:**	**Required actions before the Final Environment Decision can be approved:**
Non Federal Funds	• After the planning level purpose and need has been identified • Project does **not** need to be in the fiscally constrained MTP Project does **not** need to be fiscally constrained STIP/TIP	• Project is amended into the fiscally constrained MTP • NEPA phase of the Project is amended into the TIP or STIP • One subsequent phase of Project is in the STIP/TIP • Project must meet all NEPA requirements

Questions and Answers

General

P-047-014

1. What is a Project?

Title 23 defines a project as an undertaking to construct a particular portion of a highway, or the particular portion of a highway so constructed or any undertaking eligible for assistance under Title 23. [23 U.S.C. § 101(a)(21)]

In the regulations, 23 CFR § 1.2(b), the term is defined as an undertaking by a State highway department for highway construction, including preliminary engineering, acquisitioning of ROW and actual construction, or any highway planning and research, or for any other work or activity to carry out the provisions of the Federal Laws for the administration of Federal aid for highways.

This document uses "Project" (capital 'P') when referencing a specific undertaking described in the NEPA document (e.g., a bridge replacement), including all phases through construction. The term "project" (small 'p') is used here as a reference to a phase of a Project, or a component of such a phase (e.g., bridge piers or highway landscaping related to a Project) (*see* a more detailed definition in the Glossary).

2. What is a phase of a Project?

A Project phase is defined as separate portion of a Project such as Preliminary Engineering (PE), environment/NEPA, final design, ROW, utility relocation, construction, and/or partial construction (i.e, a component or "project"). [23 CFR § 1.2(b), § 450.216(i) and § 450.324(e)] There may be a project agreement for an individual phase of a Project.

3. What is Fiscal Constraint?

Fiscal constraint means that the MTP, TIP, and STIP include sufficient financial information to demonstrate that Projects in the MTP, TIP, and STIP can be implemented using committed, available, or reasonably available revenue sources, with assurance that the Federally supported transportation system is being adequately operated and maintained. Additionally, Projects in non-attainment and maintenance areas can be included in the first two years of the TIP and STIP only if funds for those Projects are "available" or "committed". [23 CFR § 450.216(m) and § 450.324(i)]

4. What is the NEPA decision?

NEPA decisions occur when the FHWA approves a Project location or selects a Project alternative by signing a ROD or FONSI, or approves a CE after it has determined that the Project has satisfied the planning and environmental requirements. [23 CFR Part 771]

5. What are the planning requirements?

They are the statutory requirements included in 23 U.S.C. § 134 and § 135. The implementing planning regulations are in 23 CFR Part 450. The most applicable sections on this subject can be found in the following:

- 23 CFR § 450.214 - Statewide Transportation Plan
- 23 CFR § 450.216 – Statewide Transportation Improvement Program
- 23 CFR § 450.322 – Metropolitan Transportation Plan

P-047-014

- 23 CFR § 450.324 – Metropolitan Transportation Improvement Program

6. What is the difference between an "action" defined in 23 CFR Part 771, and the term "action" used in the planning regulation?

In 23 CFR Part 771, the term "action" means a Project (highway or transit) proposed for FHWA funding or approval, which may or may not involve a commitment of Federal funds. Further, "Administration action" is approval by the FHWA of the applicant's request for funds for construction, or other activities which may or may not involve a commitment of Federal funds. [23 CFR § 771.107(b)-(c)]

In planning, we have not provided a formal definition for "action"; however, when we refer to Projects "… that require actions by FHWA," the meaning is similar to the definition of "Administration action" as stated above. [23 CFR § 450.216(h)] An action in a planning context is a step taken to advance Projects to implementation whether or not the Projects will be receiving Federal (Title 23 or 49) funds.

7. What are "regionally significant" projects?

Regionally significant projects, which may or may not be funded with Title 23 or 49 funds, are Projects anywhere in the State that have direct impact on a regional transportation system or those Projects that serve regional transportation needs (e.g., major activity centers, major planned developments such as major retail malls, sport complexes, or employment centers, or transportation terminals) and are normally part of the metropolitan or regional transportation network model. For example, these Projects can include actions such as granting access to Interstate Highways or principal arterial system, which require Federal approval, but not necessarily Federal funds. [23 CFR § 450.104]

Fiscal Constraint of Plans, TIPs, and STIPs

8. Is the term "fiscally constrained" different as it applies to the Transportation Plan, STIP, and TIP?

No, the methodology and standards for developing and assessing fiscal constraint for the Transportation Plan, STIP and TIP are the same.

However, the fiscal constraint information in the STIP and TIP should be more refined than that found in the transportation plan (MTP or SLRP). The STIP and TIP require a 4-year fiscal constraint demonstration that indicates the resources committed and/or reasonably expected to be available to carry out the programs. This means that the STIP and TIP must demonstrate and balance their revenue forecast with their expected expenditure forecast (total estimated project costs) for the near term (4-year) period while adequately operating and maintaining the federally supported transportation system. [23 CFR § 450.216(m) and § 450.324(h)]

It is more challenging for the transportation plan to forecast future revenues/costs for a 20-year time frame and to predict the exact nature of funding sources. Although near term MTP financial information is expected to be fairly accurate, the estimates for the outer years (10+ years) of the plan may be less precise. If cost ranges or bands are used (which are allowable in the outer years of the plan), associated revenues should be reasonably expected to be available to cover Project expenditures, including the upper limit of those bands or ranges. Over time, more current financial

P-047-014

data and forecasts can be developed as the MTP is updated every four to five years (or more frequently).

For outer years beyond the timeframe of the TIP and STIP, project sponsors must identify reasonably available source of funding for their Project, which should include a defined funding strategy for the completion of their Projects.

Table 4 provides information on the funding requirements and type of revenue resources that are associated with the planning documents and timeframe.

Table 4. Planning Documents and the Application of the Fiscal Constraint Funding Requirements

Planning Documents	*Project Fiscal Constraint Funding Requirements*		
	Year 1 - Year 2	Year 3 – Year 4	Year 5 – Year 20+
Metropolitan Transportation Plan (MTP)	Committed Funds	Available Funds	Reasonably Available
Statewide Long-range Transportation Plan (SLRP)	Fiscal Constraint is not required for the SLRP, but the State may want to develop, as an option, a financial plan to demonstrate what funds are reasonably available for the State project implementation.		
Transportation Improvement Program (TIP)	Committed Funds	Available Funds	For projects in the TIP and STIP that go beyond the 4 year life of the TIP/STIP, funding for Year 5 and beyond to project completion must be reasonably available.
Statewide Transportation Improvement Program (STIP)	Committed Funds	Available Funds	

9. Does full funding have to be shown in the TIP or STIP, or is it only in the Transportation Plan?

When Projects are programmed in the STIP/TIP, it is with the understanding that full funding can reasonably be anticipated to be available for the Project within the time period contemplated for the completion of the Project. That is, the estimated total cost of an entire Project and how that cost is expected to be covered, must be shown in the STIP or TIP (or in the financial element of an associated transportation plan) through the Project's anticipated year of completion. As allowed in the MTP, reasonable strategies for ensuring the availability of proposed funding sources to cover the estimated total cost of Projects may be identified to demonstrate fiscal constraint in a STIP/TIP. [23 U.S.C. § 135(g)(4)(E), 23 CFR § 450.216(i) and (m), 23 U.S.C. § 134(j)(3)(D) and 23 CFR § 450.324(e) and (i)]

For Projects in the metropolitan planning areas, estimated full Project costs need to be shown in the Metropolitan Transportation Plan. Besides demonstrating currently available and reasonably anticipated revenues to cover those costs, the financial element of a MTP may recommend strategies to ensure the availability of additional funding sources to cover the costs of all Projects and programs described in the MTP. For more discussion on this issue, see Question 13 below.

Non-metropolitan Projects do not need to be specifically identified or have their costs shown in the Long-Range Statewide Transportation Plan, but the Projects do need to be consistent with that plan.

P-047-014

10. Are non-metropolitan Projects exempt from meeting the fiscal constraint requirements?

Although there are no Federal requirements for the SLRP to be fiscally constrained, some States have instituted this as a State requirement. In those States, non-metropolitan Projects and the SLRP should be fiscally constrained as determined by State rules and procedures.

Also, within the environmental analysis for a non-metropolitan Project or corridor study, much of the information concerning cost, Project schedule, source of funds, and commitments by Project sponsor are documented. In most cases, the fiscal constraint demonstration or other financial information is included in the environmental documents.

When rural Projects are programmed, the key is to secure available funding and correctly list it in the fiscally constrained STIP prior to the ROD/FONSI/CE being approved. The Project sponsor should document Project funding and demonstrate fiscal constraint in the financial plan portion of the STIP. The STIP's financial plan is a good practice and should be used to fully document the STIP's fiscal constraint determination. Further, the financial information can subsequently be used in the Financial Plan required for Projects costing $500 million or more.

11. Do corridor or feasibility studies need to comply with the fiscal constraint requirement?

Planning studies must be listed either in the work programs, STIP/TIP, or both. [23 CFR § 420.119(e), 23 CFR § 450.216(g)(2) and (4)]

For those studies funded with NHS, STP, or other Federal-aid, the State should list the cost for these planning studies in the STIP/TIP to meet fiscal constraint requirements, unless the State and the MPO(s) have choosen to exclude them from the STIP/TIP [23 CFR § 450.216(g)(4)].

However, the majority of corridor and feasibility studies are funded with PL or SPR funds. The PL/SPR funded projects should be listed in the UPWP or SPR Work Program as appropriate, but do not need to appear in the STIP. [23 CFR § 450.216(g)(3)]

12. Does the fiscal constraint requirement apply to a Tier I EIS?

A Tier I EIS, a corridor study, or a feasibility study may be initiated prior to any resulting Project being fiscally constrained in the MTP.

A Tier I EIS can be a broad study that is based on early decisions made in the planning process, such as the type of project, the general location, and the major design features. In cases where a Tier I EIS is similar to a major corridor and/or investment study described in 23 CFR § 450.212 and § 450.318, the Tier I ROD may be signed without demonstrating fiscal constraint. In cases where the purpose of the Tier I is only to be a corridor or similar study, there should be a discussion as to why this type of documentation is being used. A Tier I EIS is a NEPA document, and a corridor study is more effectively carried out as a planning document.

When the scope of the Tier I document is clearly defined to include a decision that could result in a Federally-funded action (such as the purchase of ROW), the Project must be listed in the MTP and STIP/TIP, with one subsequent phase listed in the existing STIP/TIP before the Tier I ROD can be signed. The subsequent phase (Tier II) will be the continuation of the NEPA process. In the case of a "No Build" decision, the ROD can be signed without a subsequent phase of work listed. Because of the nature of the Tier I decision making, Tier I Project cost estimation may be broader (e.g., use of banding) than for the regular projects.

P-047-014

As provided in Appendix A of 23 CFR Part 450, the option of linking the transportation planning and NEPA process may be the most appropriate vehicle for corridor/feasibility study rather than the Tier I EIS. Linking Planning and NEPA connects the environmental analysis with the analyses that are used to develop the MTP, STIP/TIP, or planning-level/corridor/subarea/feasibility studies. When done in accordance with Appendix A, these analyses or studies are still within the scope of the planning process and are not subject to the fiscal constraint requirement. [23 CFR § 450.212, § 450.318, and Appendix A]

13. Does the MTP need to include a Project phase that is planned for future years, beyond the 20-year horizon?

Yes, regulations require that the entire Project described in the ROD, FONSI, or CE shall be consistent with the MTP. In the metropolitan areas, only the Project phases within the 20-year time horizon of the MTP must be fiscally constrained, but other phases and associated costs need to be referenced in the plan. [23 CFR § 450.322(f)(10)] Illustrative Projects are not part of the fiscally constrained MTP, and are listed only for informational purposes, until such time as additional resources beyond those identified in the MTP are to become available. [23 CFR § 450.322(f)(10)(vii)]

14. What assurance is needed to determine if a Project meets fiscal constraint?

Within the NEPA documentation, a discussion should be included on the planning information that was used to develop the Project. It should provide information about the Project and its relationship with the current MTP and TIP, including corridor or feasibility study information, a comparison of design concept and scope, and specific references in the current transportation plan and the TIP to assist in identifying the Project.

15. If the majority of the Project implementation is beyond the four year time frame of the STIP/TIP, does the full Project cost information still need to be in the STIP/TIP?

For Projects scheduled to start within the existing STIP/TIP years, if the majority of the work will be conducted in years beyond the STIP/TIP time frame, only the Project costs within the next four years must be in the STIP/TIP. [23 CFR § 450.216(m), § 450.324(e)] For portions of the Project that are beyond the STIP/TIP years, the Project must be in the fiscally constrained MTP and the estimated total Project cost must be described within the financial element of the MTP, STIP, and/or applicable TIP. For more information about this, please review Questions 8, 9, and 10. [23 CFR § 450.216(m), § 450.322(f), § 450.324(h)-(i)]

16. Can the environmental decision be signed if the next phase of the Project (e.g. PE, final design, ROW, utility relocation, construction, or construction phase) is beyond the horizon of the STIP/TIP and is not included in the STIP?

Generally at least one subsequent phase of the Project must be included in the approved STIP/TIP before the FHWA can sign the ROD or FONSI, or approve the CE. However, in the unusual instances where no subsequent phase of the Project falls within the STIP/TIP timeframe, then a description of the Project must be included in the STIP/TIP for informational purposes and identified as being beyond the horizon of the STIP/TIP. "Unusual instances" refers to situations where an agency can expect lengthy Project delays after the final NEPA decision.

P-047-014

17. What happens to a Project when the revenue situation changes and the Project may or may not be in the fiscally constrained Metropolitan Transportation Plan?

In cases where the FHWA finds a MTP to be fiscally constrained and a revenue source is subsequently removed or substantially reduced (i.e., by legislative or administrative actions), the FHWA will not withdraw the original determination of fiscal constraint; however, in such cases, the FHWA will not act on an updated or amended MTP until such time that it reflects the changed revenue situation.

However, if the MPO expects that the revenue situation has changed and projects identified in the plan cannot be financially supported to completion, we recommend the MPO revise its revenue numbers and amend the plan.

Further, when the MPO updates its MTP, we suggest the MPO request that project sponsors revisit their current projects that are in the existing fiscally constrained plan to ensure that the Project description (e.g. project scope, location, and purpose and need) and associated cost estimates are still valid and that funding resources are still available for the completion of the Project. Also, Project sponsors should advise and update the MPO with current information for the MTP if their Project cost estimates have been revised due to NEPA document re-evaluation or a supplemental EIS.

18. Can the ROD/FONSI/CE be approved when the funding in the environmental documentation does not match what is in the MTP or STIP/TIP?

No. As the final environmental review is completed, it is important to ensure that the cost estimates are consistent with costs described in the MTP and STIP/TIP. If there is a significant difference between the Project cost estimates in the final environmental document compared to the MTP and/or STIP/TIP, this potentially may impact the overall fiscal constraint demonstration and the mix of future projects selected for funding in the MTP and STIP/TIP if the Project is underfunded. In this case, a plan and/or STIP/TIP amendment is necessary prior to the final NEPA decision.

Note: We recommend that environmental documentation and planning documents use Year of Expenditure (YOE) dollars for the cost estimates. *See* Question 21.

19. Does the Long-Range Statewide Transportation Plan (SLRP) have to be fiscally constrained?

No. The planning regulations do not require the Long-Range Statewide Transportation Plan to be fiscally constrained, although some States have found it beneficial to include a statewide financial plan. The financial plan can show how longer-range statewide transportation projects can be implemented, indicate the resources that are reasonably available (i.e., reasonably available public and private funds), and identify revenue shortfalls and potential financial strategies to fund the needed projects and programs. [23 CFR § 450.214(l)]

20. How does a State monitor all the non-metropolitan Major Projects and ensure that there is adequate funding in the future years in absence of a statewide financial plan?

A Project with a total estimated cost of $500 million or more that is receiving Federal financial assistance is designated as a Major Project. Section 106(h)(3) of Title 23 states a Finance Plan shall be produced for a Major Project and should demonstrate the Project's fiscal constraint and also document all the existing on-going future commitments such as required for Major Projects. Since most Major Projects are multi-year projects, the Major Project information will appear in the STIP and will be carried over to future STIP(s). This information is not only critical to ensure that the current STIP meets the fiscal constraint requirement, but also to ascertain that there is adequate

P-047-014

future funding to complete the Major Project. Furthermore, the financial plan for the STIP could capture the anticipated funding commitments for all Major Projects in one document.

In addition, a Project with a total cost between $100 million and $500 million, while not classified as Major Project, requires the preparation of Finance Plans that must be made available to FHWA upon request. [23 U.S.C. § 106(i)]

Year of Expenditure (YOE) Funds

21. What is Year of Expenditure (YOE)?

Year of Expenditure dollars are dollars that are adjusted for inflation from the present time to the expected year of construction. By using YOE dollars, this ensures that the more accurate cost estimates are used in planning, programming and implementation of the Project.

The planning regulations require that revenue and cost estimates in the MTP, STIP, and TIP, must use inflation or growth rate(s) to reflect "year of expenditure dollars," based on reasonable financial principles and information, developed cooperatively by the State, MPOs, and public transportation operators. [23 CFR § 450.216(l), § 450.322 (f)(10)(iv), and § 450.324(h)] Year of expenditure cost estimates should also be used in NEPA documentation.

In addition, the Major Project Guidance requires financial information associated with the Project (NEPA phase through final construction) must be included in the Major Project financial plan, regardless of the source of funding. These costs must be expressed in YOE dollars and estimated using a risk based approach.

See Major Project Financial Guidance:
http://www.fhwa.dot.gov/ipd/project_delivery/resources/financial_plans/guidance.htm.

Environmental Studies and Planning Process

22. One of the examples (Colorado: I-25) in the January 28, 2008, memorandum described a phased NEPA decision-making process, sometimes described as "phased RODs/FONSIs". Is this allowed as a mechanism to break-up a larger Project to deal with limited available Project funding and fiscal constraint or for political reasons?

A Project that will be built over time with multiple work phases based on one NEPA decision document is not a phased ROD/FONSI. it is a *phased Project.* A phased ROD/FONSI occurs when there is one NEPA evaluation document but from that evaluation document, a NEPA decision document (ROD/FONSI) is issued for only a section or portion of the proposed Project (e.g., construction of a two mile section of a proposed 10 mile long highway).

The FHWA acknowledges some Projects that are currently in the midst of a lengthy NEPA process anticipate use of phased decision making. It is expected that these Projects will proceed, but the FHWA expects the future use of the phased ROD/FONSI concept will be limited to situations where there are unanticipated changes in circumstances after the planning process, or where the phased nature of the decision making on a corridor or project is fully discussed and defined in the context of the NEPA study on which the phased decision will be based (including agency and public

P-047-014

involvement). This approach should be considered only after consultation with both the Office of Project Development and Environmental Review and the Office of Chief Counsel.

23. How should the planning process be used to determine Projects, needs, and priorities?

Statewide and Metropolitan transportation planning should be the foundation for highway and transit Project decisions, emphasizing public involvement, and consideration of environmental and other factors. The planning process identifies the transportation system needs and the Projects that will address these needs. With the fiscal constraint requirement, the planning process can recommend and advance only those Projects that a State/MPO/local agency can afford to implement.

In the overall planning process, corridor, subarea, or other focused planning studies should clearly identify the purpose and need of proposed Projects and weed out those that are not environmentally and/or financially feasible unless new or additional revenue sources are identified. Transportation agencies need to consider methods to improve linkages between planning and environmental issues in order to focus subsequent NEPA review on a more limited list of Project options. In this manner, agencies can better evaluate Project feasibility and costs before launching into what can be a long and expensive NEPA review process.

24. Does starting the environmental analysis process for a Project (even with State or local funds) ensure future Federal-aid funding?

No, starting the environmental analysis process does not ensure future Federal funding commitments. If however, a Project sponsor wants to advance a Project that is not in the fiscally constrained plan or STIP/TIP, it may do so with its own funds. In this case, Federal funds are not to be used to conduct the environmental analysis process. The project sponsor assumes the risk that the Project may not be eligible for or receive Federal funds, if later requested. By not being part of the broader transportation planning process, this Project still has to compete for the available limited Federal funds that have not been assigned to other Projects. A final NEPA decision for the Project will not be made until all appropriate elements listed in the "Requirements" section" of this document have been met.

Nonattainment and Maintenance Areas

25. What Projects are subject to the project level transportation conformity requirements?

Project level conformity applies to nonexempt (those projects not listed in 40 CFR § 93.126) FHWA/FTA projects. For purposes of conformity, an FHWA/FTA project is any highway or transit project which is proposed to receive funding assistance and approval through the Federal Aid Highway program or the Federal mass transit program, or requires FHWA or FTA approval for some aspect of the project, such as connection to an interstate highway or deviation from applicable design standards on the interstate system.

26. What are the transportation conformity requirements that must be addressed before the NEPA decision can be signed?

Before the NEPA decision (ROD, FONSI, or CE) can be signed by the FHWA, regulations require that a project level conformity determination be made for all nonexempt FHWA/FTA projects that are subject to transportation conformity. [40 CFR§ 93.104(d)]

P-047-014

In the metropolitan areas, conformity for a nonexempt FHWA/FTA project can be demonstrated if the Project is part of a conforming metropolitan transportation plan and TIP, and meets all the project level conformity requirements. [40 CFR § 93.104(d) and § 93.109]

For a nonexempt FHWA/FTA project in a "donut" area (part of the nonattainment and maintenance area that lies outside of the metropolitan planning area boundary), the Project must be included in the regional emissions analysis that supported the conformity determination of the associated metropolitan transportation plan and TIP and meet all applicable project level conformity requirements. [40 CFR § 93.109]

In an isolated rural non-attainment and maintenance area, Project level conformity must meet all the requirements in 40 CFR § 93.109(l) prior to the FHWA signing or approving the ROD, FONSI, or CE.

For more information, please see http://www.fhwa.dot.gov/environment/conformity/feis_rod.htm.

27. How do transportation conformity requirements apply in tiered EIS documents?

The transportation conformity regulation (40 CFR § 93.126) states that "specific activities that do not involve or lead directly to construction, such as planning and technical studies" are exempt from the requirement to determine conformity. Therefore, project-level conformity requirements, including any relevant hot-spot analyses, do not apply for the Tier 1 EIS. However, should a named Tier 1 analysis transition into a Tier 2 product and the project sponsor decides to seek a decision leading to a selected alignment, with the ROD allowing acquisition of right of way and authorization of final design, P,S &E, etc., then project level conformity would be required.

In the Tier 2 EIS, the preferred alternative would be selected from the shorter list of alternatives identified in the Tier 1 EIS. All requirements for project-level conformity apply for the preferred alternative selected in the Tier 2 EIS. Project-level conformity must be determined before the Tier 2 ROD can be signed.

Major Projects: Phased Construction and Operational Independence

28. For a Major Project, if the Project phases are not identified in the approved environmental decision, can the state decide at a later date to construct the Major Project in phases?

Yes, on a case-by-case basis, the scope of work described by the ROD, FONSI, or CE can be divided into a phased Project that corresponds to operationally independent increments of work (as described in question below and Question 22 above) which will be built non-concurrently. The FHWA Division Office will need to consult with the FHWA Project Delivery Team (formerly the Major Projects Team) prior to making this determination. In cases where the scope of the work is divided into a phased Project after the NEPA decision, Major Project requirements will apply only to the individual Projects meeting the Major Project designation requirements.

29. What requirements need to be met before determination of operational independence and non-concurrent construction is approved by the FHWA (HQ and Division)?

"Operational independence" is a project management and financial planning concept that applies to Projects that are subject to 23 U.S.C. § 106(h). An operationally independent phase of the Project is a component of the overall Project that can be built and can function as a viable transportation facility even if the rest of the Project described in the environmental document is never built.

P-047-014

Multiple contracts developed for bidding by the Owner for contract administration purposes or due to funding shortfalls are generally not considered to be operationally independent.

Operational Independence is further defined and discussed in the guidance on operational independence and non-concurrent construction[4] and in FHWA Major Project guidance[5].

Note that "operational independence" is not the same as NEPA "independent utility" and the two concepts are used for different purposes. In 23 CFR § 771.111(f), the FHWA's assessment of independent utility and logical termini occurs during the NEPA review in order to ensure a meaningful evaluation of alternatives and to avoid commitments to transportation improvements before they are fully evaluated. This includes considering whether the Project will result in a usable facility and will be a reasonable expenditure even if no additional improvements in the area are made. Given the extensive record of such NEPA determinations, distinguishing the Major Project Review requirements from the environmental review requirements helps avoid unintended consequences in implementing 23 U.S.C. § 106(h).

FHWA Division Office's Roles and Responsibilities

30. Whose job is it to make sure that all planning requirements are in place before final NEPA decision is made?

Under the Federal-aid program, it is the role of the FHWA Division Office to help the State, MPO(s), and Project sponsors navigate through and meet these requirements. The Division Office should have all environmental and planning information at hand. The planners and environmental specialists should work closely and develop a process or system that can help track all the relevant information as the environmental documents are being completed.

31. Why is fiscal constraint requirement critical now?

Fiscal constraint has been a critical part of the planning and project development processes since the passage of ISTEA in 1991. In today's limited fiscal environment, it is critical that we provide due diligence as to how public funds are expended. When making NEPA decisions, including the decisions whether to initiate the NEPA process, it is incumbent on the Division Office to consider the broader context of fiscal stewardship. Fiscal stewardship is a critical role and responsibility for the FHWA and is engrained throughout the transportation decision making process: from fiscal constraint requirements in the transportation planning process, to reasonable cost estimates of alternatives in project development and the NEPA process, to financial plans and Major Project requirements during design and construction.

The FHWA must actively encourage transparency, consistency, and reasonableness with regard to planned expenditures of public resources, and attempt to ensure that consistent messages are being provided throughout the planning, project development, NEPA, design, construction, operation, and environmental mitigation follow-up processes.

[4] http://www.fhwa.dot.gov/ipd/project_delivery/resources/operational_construction/memo_operational_independence.htm
[5] http://www.fhwa.dot.gov/ipd/project_delivery/resources/general/mpg_memo.htm

P-047-014

32. . How do we ensure that environmental studies are for real and viable projects?

An effective transportation planning process requires the MPOs and the States to make the appropriate decisions that will benefit the transportation system and the region. A robust planning process that includes planning/corridor/subarea/feasibility studies, environmental analysis, and financial planning will help project sponsors, the MPOs, and the States to determine if completing all of the proposed Projects is achievable, given the anticipated revenues and the relative priorities of these Projects. The planning process, when appropriately used as a screening mechanism, ensures that only those "viable" Projects that meet funding and priority requirements will advance. These "viable Projects" will be limited in number and with the smaller number of Project commitments, the FHWA can better leverage its staff resources in reviewing and providing oversight of the NEPA process.

P-047-014

Appendix A

STATUTORY AND REGULATORY REQUREMENTS FOR FISCAL CONSTRAINT / FINANCIAL PLANNING IN THE FEDERAL TRANSPORTATION PLANNING PROCESS

Type of Plan/Program/ Project	Fiscal Constraint requirement?	Financial Plan Required?	Update Schedule/Notes
Metropolitan Transportation Plan	Yes	Yes	Plans must have at least a 20-year time horizon and be updated every 5 years in attainment areas and every 4 years in non-attainment and maintenance areas. Also, for nonattainment and maintenance areas, the financial plan shall address the specific financial strategies required to ensure the implementation of TCMs in the applicable SIP.
Metropolitan Transportation Improvement Programs (TIPs)	*Yes – must be fiscally constrained by year	Yes	Must be updated at least every four years; MPO must develop Annual Listing of Obligated Projects consistent with the categories identified in the TIP. Also, in nonattainment or maintenance areas, projects included for the first 2 years of the TIP shall be limited to those for which funds are available or committed.
Statewide Transportation Improvement Programs (STIP)	Yes – must be fiscally constrained by year	Not mandatory, but if not included, financial issues should be addressed in some other way	Not less than 4-year time horizon; must be updated at least every four years; funding shown in STIP must be consistent with funding shown in the TIPs for the metro portions of the statewide program. Also, in nonattainment or maintenance areas, projects included for the first 2 years of the STIP shall be limited to those for which funds are available or committed.
Statewide Transportation Plan	Not required	Not required, but must reference or contain information on the availability of financial and other resources needed to carry out the plan	No mandatory update schedule. Not less than 20-year horizon.
FHWA Major projects (>$500 Million cost)	Yes, near term phases must be part of fiscally-constrained TIP and STIP	Yes. NOTE: this is a project-specific financial plan that is different than the region's financial Plan for the Long Range Transportation Plan	Single project plan.
FTA Major Capital Investments (Mainly New Starts)	Yes, must be in fiscally constrained TIP and STIP	Yes	Project level plan. Projects entering the FTA New Starts process also require Alternatives Analysis pursuant to 49 U.S.C. §5309(e)(2).

16

Glossary

P-047-014

Air Quality Attainment areas
An area considered to have air quality that meets or exceeds the U.S. Environmental Protection Agency (EPA) health standards used in the Clean Air Act. An area may be an attainment area for one pollutant and a nonattainment area for others.

Air Quality Maintenance areas
Any geographic region of the United States previously designated nonattainment pursuant to the CAA Amendments of 1990 and subsequently re-designated to attainment subject to the requirement to develop a maintenance plan under section 175A of the CAA, as amended.

Air Quality Non-attainment area
A geographic region of the United States that the EPA has designated as not meeting a given national ambient air quality standard (NAAQS).

Banding
For the outer years (i.e., beyond the first 10 years) of the MTP, the financial plan may reflect aggregate cost ranges/cost bands, as long as the future funding source(s) is reasonably expected to be available.

Categorical Exclusion (CE)
A Project may be categorically excluded from a detailed environmental analysis in an Environmental Assessment (EA) or Environmental Impact Statement (EIS) if it meets certain criteria that a Federal agency has previously determined as having no significant environmental impact and does not involve unusual circumstances that require evaluation. Types of actions typically considered by FHWA to be categorically excluded are described in 23 CFR § 771.117.

Conformity
A process to assess the consistency of any transportation plan, program or project with State air quality implementation plans. The transportation conformity process is defined by the Clean Air Act as amended and implemented by 40 CFR Part 51 and Part 93.

Donut area
Geographic areas outside a metropolitan planning area boundary, but inside the boundary of a nonattainment or maintenance area that contains any part of a metropolitan area(s). These areas are not isolated rural nonattainment and maintenance areas.

Final NEPA Decision
A final NEPA decision is documented in a ROD, FONSI, or CE determination.

Finding of No Significant Impact (FONSI)
A Federal agency prepares a written environmental assessment (EA) to determine whether or not a project would have significant impacts on the environment. If the answer is no, the agency issues a finding of no significant impact (FONSI). The FONSI may address measures which an agency will take to reduce (mitigate) potentially significant impacts.

Independent Utility
Project must be usable and be a reasonable expenditure even if no additional improvements in the area are made , as described in 23 CFR § 771.111(f).

Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA)

P-047-014

ISTEA (Public Law 102-240) is a Federal law that made major changes to transportation planning and policy as embodied in Title 23 of the United Stated Code.

Isolated rural nonattainment and maintenance areas

Areas that do not contain or are not part of any metropolitan planning area as designated under the transportation planning regulations. Isolated rural areas do not have federally-required metropolitan transportation plans or TIPs and do not have Projects that are part of the emissions analysis of any MPO's metropolitan transportation plan or TIP. Projects in such areas are instead included in statewide transportation improvement programs. These areas are not donut areas.

Long-range Plan (LRP)

This is a 20-year horizon plan that identifies facilities that should function as an integrated transportation system, and are developed pursuant to Title 23 and 49, U.S.C. (United States Code). It gives emphasis to those facilities that serve important national and regional transportation functions, and includes a financial plan that demonstrates how the long-range plan can be implemented. Both the SLRP and MTP are examples of long-range plans.

Long-Range Statewide Transportation Plan (also referred to as SLRP)

Long-range Statewide Transportation Plan means the official, statewide, multimodal, transportation plan covering a period of no less than 20 years developed through the statewide transportation planning process.

Major Project

Federal-aid Project funded under Title 23 with an estimated total cost of $500 Million or more. Major Projects are requires to submit a project management plan and an annual financial plan to FHWA for review.

Metropolitan Planning Organization (MPO)

The organizational entity designated by Federal law with lead responsibility for developing transportation plans and programs for urbanized areas of 50,000 or more in population.

Metropolitan Transportation Plan (MTP)

This is the official multimodal transportation plan addressing no less than a 20-year planning horizon that is developed, adopted, and updated by the MPO through the metropolitan transportation planning process.

NEPA and NEPA Process

The National Environmental Policy Act (NEPA) (42 U.S.C. § 4321 et seq.) requires Federal agencies to integrate environmental values into their decision making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. There are three NEPA classes of action: categorical exclusions (CEs), which may apply if an action meets established criteria and has no significant environmental impacts individually or cumulatively; environmental impact statements (EISs), which are required for actions with significant environmental impacts; and environmental assessments (EAs), which are used to evaluate an action when the significance of environmental impacts is not certain. An EA may result in a finding of no significant impact (FONSI) if analysis shows there are no significant environmental impacts or the action includes mitigation for potentially significant impacts, or an EA may result in the preparation of an EIS.

Non-metropolitan Area

The term "non-metropolitan areas" means all areas of a State that are outside the MPO planning boundary areas.

P-047-014

Operational Independence

This is a term unique to Major Project Guidance, which describes conditions under which a component of the overall Major Project may proceed if the component can be built and can function as a viable transportation facility even if the rest of the Project described in the environmental document is never built.

Project

A Project is an undertaking by a State highway department or local agency for highway, transit, or other action eligible for Federal funding or requiring Federal approval. In this document, the term "Project" (capital 'P') refers to a specific proposed facility or other action as defined in the NEPA document and includes every "phase of a Project", such as preliminary engineering, acquisition of rights-of-way and actual construction, unless otherwise stated. The term "project" (small 'p') is used here as a reference to a phase of a Project, or a component of such a phase (e.g., bridge piers or highway landscaping related to a Project).

Record of Decision (ROD)

A ROD presents the environmental decision by the Federal agency for a Project, the basis for the decision, identifies the selected alternative, and summarizes any mitigation measures that will be incorporated in the Project. The ROD can only be signed once the Project final EIS meets all the requirements in 23 CFR Part 771.

Regional Transportation Plan (RTP)

Some states refer to their MTP as RTP. They are the same document.

Statewide Transportation Improvement Program (STIP)

This is a statewide prioritized listing/program of transportation projects covering a period of four years that is consistent with the long-range statewide transportation plan, metropolitan transportation plans, and TIPs, and required for Projects to be eligible for funding under title 23 U.S.C. and title 49 U.S.C. Chapter 53.

Transportation Improvement Program (TIP)

Also known as a transportation program, a TIP is a prioritized listing/program of transportation projects covering a period of four years that is developed and formally adopted by an MPO as transportation plan, and required for Projects to be eligible for funding under title 23 U.S.C. and title 49 U.S.C. Chapter 53.

Year of Expenditure (YOE)

Year of expenditure dollars are dollars that are already adjusted for inflation. For example, if two identical items each have a current value of $1,000, it may in fact, cost $1,000 to purchase one of them in the first year of a Project, while it is estimated to cost $1,200 to purchase the other in the fourth year of a Project.

From: james.saxton@dot.gov
To: Wills, Heather; Ted.Uyeno@dot.gov; Gehrke, Linda; McAvoy, John
Cc: Heilman, Jeff
Subject: RE: BRP recommendations and NEPA
Date: Monday, March 14, 2011 2:57:08 PM
Attachments: CRC supplemental evaluations and BRP 2.3.14.11 ss suggested edits.docx

P-047-014

Heather,

FTA has made some suggested edits. Overall, the paper is reflective of previous discussions. Please keep in mind that while we anticipate that a re-eval appears sufficient for the composite truss based on the information we have at this time, without the current benefit of the re-eval, we cannot commit that a re-eval is all that will be needed. Thanks for the opportunity to review.

Steve

From: Wills, Heather [mailto:WillsH@columbiarivercrossing.com]
Sent: Monday, March 14, 2011 10:45 AM
To: Saxton, James (FTA); Uyeno, Ted (FTA); Gehrke, Linda (FTA); McAvoy, John
Cc: Heilman, Jeff
Subject: BRP recommendations and NEPA
Importance: High

Good morning!

Attached is a draft document that outlines the implications of the BRP recommendation related to NEPA, and specifically the need to do a supplemental EIS. We have outlined that a composite truss bridge type on the same alignment would not require a supplemental EIS because any impacts have already been disclosed in the DEIS. Further, we outline why the high level bridges would likely require an SEIS based on the environmental impacts that have not been disclosed.

This weekend I went back and reviewed all the screening documents to see how we documented the rationale for dismissing the high level bridges, and it was because they would cause safety impacts to aviation. The high bridges were not dismissed because of permitting issues, which I think is an important point. Furthermore, the screening criteria, as well as the dismissed alternatives, were adopted by the task force, InterCEP and discussed with the public in various venues.

We would greatly appreciate your review of the attached document that comprehensively discusses all of these issues. It would be helpful to have your feedback by tomorrow if possible. I know that is quick. Just let me know what you are able to do.

Thanks!
Heather

Heather Wills | Environmental Manager
p. 360.816.2199
willsh@columbiarivercrossing.org

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

P-047-014

Implications of the BRP report on the NEPA process

This paper addresses the key questions regarding the BRP report and its effect on the NEPA process:

1. ~~Does~~ Do the new information and recommendations in the BRP report~~,~~ warrant the preparation of a supplemental DEIS (SDEIS)?
2. Would a SDEIS be required to advance either the cable-stayed or tied arch bridge to an FEIS?
3. Would a SDEIS be required to advance the composite truss bridge to an FEIS?

Based on NEPA regulations, case law, and conversations with the federal lead agencies, the consideration of the information and recommendations in the BERP report do not require preparation of an SDEIS. Similarly an SDEIS is not needed to screen out the high level bridges and advance the composite truss to an FEIS. However, an SDEIS would likely be required before one of the high-level bridges could be included in an FEIS or ROD. The difference between the process required for the different bridge types hinges primarily on the variance in impacts. The high level bridges would result in new, likely significant impacts that were not evaluated for the range of alternatives in the DEIS. The composite truss bridge type is nearly identical in character and in all issues bearing on environmental impacts to one or more of the alternatives evaluated in the DEIS. Furthermore, the composite truss would be the environmentally preferable option for the river crossing.

NEPA Regulations

CEQ NEPA regulations as well as FHWA and FTA NEPA regulations are clear that a supplemental EIS is not required merely because there is new information or new ideas. The expectation is that a DEIS cover a reasonable range of alternatives. At any point in the NEPA process, any person or group can suggest new ideas or provide new information, and the lead agencies should consider that information. However, that such ideas or information arise is not an inherent cause for preparing a supplemental EIS. A supplemental EIS is required only if the proposed action would result in significant environmental impacts that were not evaluated in the previous EIS (the new impacts could be the result of changes in the project itself or through changes in environmental information relevant to the proposed action's impacts). The key issue is that, in this situation, a SDEIS is required only if the proposed action itself changes, or environmental circumstances change, such that the proposed action would have new, significant impacts not evaluated in a previous EIS.

If the CRC proposed action for the river crossing bridge type is revised to the cable-stayed design, there would be new, potentially significant impacts not evaluated in the DEIS. If the proposed action for the river crossing is revised to the composite truss, there would be no new significant impacts that were not previously evaluated in the DEIS.

CEQ NEPA regulations (40 CFR 1500) describe two basic situations in which agencies are required to prepare a supplemental EIS:

- *"Agencies shall prepare supplements to either draft or final environmental impact statements if:*
  - *The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or*

P-047-014

- *There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts."* (1502.9(c)(1))

This aspect of the CEQ regulations is essentially mirrored and supplemented in the FHWA and FTA NEPA regulations. The following is from Title 23, Part 771 of the United States Code of Federal Regulations. This regulation prescribes the policies and procedures of the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) for implementing the National Environmental Policy Act.

(a) A draft EIS, final EIS, or supplemental EIS may be supplemented at any time. An EIS shall be supplemented whenever the Administration determines that:

(1) Changes to the proposed action would result in significant environmental impacts that were not evaluated in the EIS; or

(2) New information or circumstances relevant to environmental concerns and bearing on the proposed action or its impacts would result in significant environmental impacts not evaluated in the EIS. (23 CFR S 771.130)

The following describes how these parallel elements of the CEQ and the FTA/FHWA NEPA Regulations regarding supplemental EISs relate to the current situation for the CRC project.

When the Proposed Action Changes

The following is the language from CEQ and FTA/FHWA NEPA regulations regarding when changes in the proposed action would require preparation of a supplemental EIS. Agencies are to prepare a supplemental if:

- *The agency makes substantial changes in the proposed action that are relevant to environmental concerns* (40 CFR1502.9(c)(1))
- *Changes to the proposed action would result in significant environmental impacts that were not evaluated in the EIS* (23 CFR 771. 130 (a)(1))

As noted previously, the mere presence of new design or project ideas does not trigger the need for an SDEIS. There must be actual changes to the proposed action, and those changes must result in new, significant environmental impacts not previously evaluated in an EIS. Merely considering new information and considering new ideas does not constitute a change in the proposed action.

If the composite truss is advanced there would be no substantial changes in the proposed action relevant to environmental concerns; there would be no significant environmental impacts from the proposed action that were not evaluated in the DEIS. Environmental impacts would be essentially the same as those evaluated for the open web box and well within the scope of impacts evaluated and disclosed in the DEIS. The composite truss bridge would not require an SDEIS before advancing to an FEIS. The current process to gather public and agency input, evaluate impacts and conduct a "re-evaluation" has indicated that the composite truss design could advance directly to an FEIS.

For the high-level bridges, however, because of their additional and potentially significant environmental impacts that were not evaluated in the DEIS, an SDEIS would likely be required

P-047-014

before they could advance to an FEIS and ROD. The primary concern is that these bridge types were evaluated by the project (with public and agency input) in 2006-07 and were dropped from further consideration, primarily because of aviation-related concerns. That evaluation and conclusion were communicated to the public and agencies in 2007 and these bridge types were referenced in the DEIS as options that had been evaluated but were no longer being considered.

To change that conclusion at this point in time would introduce potentially significant impacts and regulatory issues that were not evaluated in the DEIS, including substantial above-deck structures on the river crossing, substantial intrusion into Pearson Field airspace, the likelihood of a hazard determination from FAA, impacts on airfield operations and safety, and potential liability associated with any such impacts. Changing to this bridge type introduces new, potentially significant issues that were not evaluated or proposed in the DEIS. Bridges that would have these kinds of impacts were eliminated before the DEIS was published.

In addition, the cable-stayed or tied arch bridge would have greater impacts to threatened and endangered species due to the need for more in-water construction. They have fewer but larger bridge pier foundations than the composite truss, thus requiring 10 - 20% more temporary pile driving than the composite truss bridge and potentially the need for additional, larger coffer dams. The cable-stayed or tied arch bridge would also have three to four more acres of impervious surface area and therefore more storm water runoff, requiring more upland area to treat the runoff.

When New Information Arises

The following are the parallel excerpts from the CEQ and FTA/FHWA NEPA regulations regarding when new information or new circumstances require preparation of a supplemental EIS. Agencies are to prepare supplements if:

- *There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.* (40 CFR 1502.9(c)(1))
- *New information or circumstances relevant to environmental concerns and bearing on the proposed action or its impacts would result in significant environmental impacts not evaluated in the EIS.* (23 CFR 771. 130 (a)(1))

These conditions clearly do not indicate that the mere presence of new information, even significant information, requires the preparation of a supplemental EIS. The new information has to both significant and relevant to the environmental concerns of the proposed action or its impacts. As 23 CFR clarifies, the new information has to result in significant environmental impacts from the proposed action not evaluated in the EIS. This condition refers to the situation in which the proposed action itself may not have changed since the DEIS, but new information, for example regarding environmental conditions, has come to light such that significant environmental impacts not previously evaluated in the existing DEIS, will now result from the proposed action.

The BERP report clearly provides some new information that was not available during the DEIS. The BERP report recommends not advancing the open web design and instead recommends that the project advance either the composite truss, cable-stayed or tied arch bridge type. The BERP made these recommendations based on new analysis they conducted regarding cost and

P-047-014

schedule risks; they did not evaluate environment impacts and their recommendations were not based on environmental concerns.

The BERP report also provides information regarding aviation safety and FAA regulatory standards. However, this information is not fundamentally different from what was used in 2006-7 to evaluate conceptual bridge types (low, mid, and high level bridges). That evaluation led the project and CRC Task Force to drop "high-level bridges" (including cable-stayed and tied arch designs) from further consideration. The "Draft Components Step A Screening Report" (CRC 2007) documents the criteria that were used to evaluate and either advance or drop bridge options in that phase of project development.

As documented in the 2007 report, this screening criterion was based on impacts to safety, including aviation, traffic and navigation safety. The airspace-related safety question was based on encroachment; it did not rely on the outcome of any reviews or approvals from FAA. Rather, the screening criteria were built off of the project's Problem Statement and the Purpose and Need, and they were adopted by the 39-member CRC Task Force. The aviation safety criterion stated that in order for a component to be advanced for further consideration, it:

- *Must not create a significant new encroachment into the Pearson Airpark airspace, and*
- *Must not encroach into PDX airspace.* (p. 3-16)

The 2007 report notes that all of the high level bridges failed the first part of this criterion and some might also fail the second part. Failing either part of this criterion was rationale for dropping that option from further consideration. Through this evaluation and following input from the public and recommendations from the Task Force, high level bridges were dropped from further consideration.

The 2010 BERP study and recommendations do not change this basic finding from the 2007 analysis and report – both the cable-stayed and tied arch bridge designs recommended by the BERP would fail to meet the first half of this adopted criterion. The BRP suggested that impacts on the airspace might be allowed by FAA, but that is irrelevant to the adopted criterion that eliminated these bridge types in 2007. While there is no prohibition against changing screening criteria at this time, nothing in the BERP report provides new information that would reverse or negate the fundamental rationale upon which the 2007 criteria were based. Therefore, the 2010 BERP report does not provide significant new information regarding aviation issues or the reasoning used to eliminate high level bridges from further consideration. It also does not provide new information bearing on significant environmental impacts from the proposed action. As noted above, an SDEIS would likely be triggered only if the high-leveled bridges become part of the proposed action. Changing the proposed action to the composite truss would not.

When it is unclear if a Supplemental is required

When the conditions that require agencies to prepare a supplemental EIS are absent, then agencies can conclude that a supplemental EIS is not required. The FTA and FHWA NEPA Regulations also provide a process that agencies can follow if they are uncertain about the significance of new impacts that would result from changes in the proposed action (23 CFR § 771.130):

P-047-014

(c) Where the Administration is uncertain of the significance of the new impacts, the applicant will develop appropriate environmental studies or, if the Administration deems appropriate, an EA to assess the impacts of the changes, new information, or new circumstances. If, based upon the studies, the Administration determines that a supplemental EIS is not necessary, the Administration shall so indicate in the project file.

The "environmental studies" cited in the above text are not synonymous with "supplemental EIS". The regulation clearly states that the "studies" would be used to determine whether or not a supplemental EIS is needed. The more appropriate instrument to accomplish this would be a NEPA "Re-evaluation" – the purpose of a NEPA re-evaluation is precisely to determine if, based on changes that have occurred since the previous EIS, a supplemental is required. CRC project staff, ~~together~~ after discussions with FTA and FHWA, has evaluated the environmental impacts of the BERP recommendations based on currently available information and have provided this information to elected officials, the public and other stakeholders for review and comment. Following the public outreach process, and direction from the governors regarding bridge type, the lead agencies will conduct a NEPA re-evaluation on whichever bridge type(s) is/are advanced. As previously described, the cable-stayed and tied arch bridge types would likely require an SDEIS, while the composite truss very likely would not.

Would the purposes of NEPA be furthered by preparing a Supplemental EIS on the BERP recommendations?

In addition to specifying when agencies must prepare supplemental EISs, the CEQ NEPA regulations also indicate when agencies may prepare one but are not required to.

- *Agencies may also prepare supplements when the agency determines that the purposes of the Act will be furthered by doing so.* (1502.9(c)(2)).

The two main purposes of NEPA are to ensure environmental information is available to decision makers and the public before actions are taken, and to have better informed decisions based on environmental ~~consequences~~implications.[1] New information is continually developed during the NEPA process, but that doesn't mean that an SDEIS is needed to ensure that it is available to decision makers and the public, or to better inform decisions based on environmental consequences. The environmental consequences of the BERP recommendations have been and are continuing to be made available to the public and agencies for comment, and to decision makers before actions are taken. A Supplemental EIS on the BERP recommendations would not add meaningful opportunities for public / agency involvement that the project has not already made available in the past or currently.

In fact, a SDEIS on the full range of BERP recommendations would be contrary to elements of CEQ NEPA regulations that require agencies to reduce excessive paperwork (40 CFR Section 1500.4) and to reduce delay (40 CFR Section 1500.5). While an SDEIS would likely be needed before advancing either of the high level bridges to an FEIS or ROD, an SDEIS is not needed or appropriate for merely considering and screening the BERP recommendations.

Following the release of the BERP report, the project reviewed the comments received during the preparation of the DEIS, the DEIS comment period and comments received while the bridge panel was convened. It was clear that the public, both through the CRC Task Force meetings and open houses during the 2006-2007screening process had several opportunities to comment

P-047-014

on high level bridges, including the elimination of them from further consideration. Also, there was opportunity in the summer of 2008 to comment on the DEIS discussion of "alternatives eliminated from further consideration", which included all high level bridges. Finally, during the BERP process and subsequent to publication of the report in 2010 and early 2011, the public was invited again to comment on this issue and the BERP report and recommendations.

The project team evaluated the new information presented in the BERP report to explore how the information might affect the findings in the DEIS and if the bridge type should be changed from the open web to one of the recommendations in the report. Impacts cannot be precisely measured without more detailed designs, but the magnitude of the additional impacts associated with the high level bridges is high enough to clearly conclude that the composite truss is environmentally preferable to either the cable-stayed and tied arch bridges.

Case Law Regarding when a Supplemental EIS is or is not needed

The court decisions listed below reinforce the above conclusions drawn from the regulations, including:

- Changes in the proposed action only require a supplemental EIS if they result in significant impacts not previously evaluated in an EIS.
- The availability of new information or new ideas does not trigger the need for a supplemental EIS; new circumstances only require a supplemental EIS if they result in significant impacts from the proposed action not evaluated in a previous EIS.

Two of the court decisions below also clarify that new economic/cost information, and changes that improve environmental impacts of the proposed action, do not require preparation of a supplemental EIS. The following case law references are from Robinson (2006).

- A supplemental EIS is not necessary *"every time new information comes to light after the EIS is finalized."* – Marsh v Oregon Natural Resources Council, N 94 supra, 490 US at 373.
- *"The new circumstance must present a seriously different picture of the environmental impact of the proposed project from what was previously envisioned."* – Sierra Club v. Froehlke, 816 F.2d 205, 210 (5th Cir. 1987)
- *"The key to whether a SEIS is necessary is not whether the area has undergone significant change, but whether the proposed road work will have a significant impact on the environment in a manner not previously evaluated and considered"* – South Trenton Residents Against 29 v FHWA, 176 F.3d 658 (3rd Cir. 1999)
- *"The test is whether the new information so alters the project's character that a new 'hard look' at the environmental consequences is necessary."* – Sierra Club v. Froehlke, 816 F.2d 205, 210 (5th Cir. 1987)
- Economic recalculations do not require a supplemental EIS if the initial environmental conclusions need not be changed accordingly - Native Ecosystems Council v. United States Forest Service, 54 Fed. App. 901, 2003 US App. LEXIS 353 (9th Cir. 2003)
- The US Army Corps of Engineers changed some aspects of a proposed regional water project after the FEIS. These changes made a difference in the environmental consequences, and plaintiffs argued that a supplemental EIS was needed given these changes. The court said that the changes actually resulted in a reduction in

P-047-014

environmental impacts and upheld the agency's determination that no SEIS was needed. – Arkansas Wildlife Federation v. US Army Corps of Engineers, 431 F.3d 1096 (8th Cir. 2005)

CEQ NEPA Regulations regarding the purpose of NEPA process (40CFR Sec. 1500.1).

(a) The National Environmental Policy Act (NEPA) is our basic national charter for protection of the environment. It establishes policy, sets goals (section 101), and provides means (section 102) for carrying out the policy. Section 102(2) contains "action-forcing" provisions to make sure that federal agencies act according to the letter and spirit of the Act. The regulations that follow implement section 102(2). Their purpose is to tell federal agencies what they must do to comply with the procedures and achieve the goals of the Act. The President, the federal agencies, and the courts share responsibility for enforcing the Act so as to achieve the substantive requirements of section 101.

(b) NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA. Most important, NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail.

(c) Ultimately, of course, it is not better documents but better decisions that count. NEPA's purpose is not to generate paperwork--even excellent paperwork--but to foster excellent action. The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment. These regulations provide the direction to achieve this purpose

From: Wills, Heather
To: "John.McAvoy@dot.gov"
Cc: Saxton, Steve
Subject: RE: FTA/FHWA re-eval checklist
Date: Tuesday, March 29, 2011 8:33:28 AM

P-047-014

I would really rather just use the one we already did and add two signature blocks. Since there is no prescribed format for re-evaluations I think this will work.

Heather Wills | Environmental Manager
p. 360.816.2199
willsh@columbiarivercrossing.org

-----Original Message-----
From: John.McAvoy@dot.gov [mailto:John.McAvoy@dot.gov]
Sent: Tuesday, March 29, 2011 7:55 AM
To: Wills, Heather
Cc: Saxton, Steve
Subject: FTA/FHWA re-eval checklist

Heather-

Steve had a FTA/FHWA re-evaluation template. I think we only need minor revisions to reflect the CRC's role (in place of WsDOT) as the local official. Transfer the data to this template, send it back to me, and I think we might be in a good position.

-John

John McAvoy, PE
Major Project Manager
FHWA-Oregon Division
610 E. 5th Ave.
Vancouver, WA 98661
Office: (360) 619-7591
Cell: (503) 949-5980

-----Original Message-----
From: Saxton, James (FTA)
Sent: Tue 3/29/2011 7:33 AM
To: McAvoy, John (FHWA)
Subject: RE: NEPA Experts

We can certainly craft a reply that limits the decision to the narrow question at hand. I think Ted will insist.

I've attached a joint form. Below is a link.

http://www.fta.dot.gov/regions/region10/regional_offices_7747.html

-----Original Message-----
From: McAvoy, John (FHWA)
Sent: Tuesday, March 29, 2011 7:27 AM
To: Saxton, James (FTA)
Subject: RE: NEPA Experts

P-047-014

Steve-

This morning I got an email from our NEPA experts stating, "I think the answer to the narrow question of whether the composite truss on the same alignment, assuming no other changes, is fairly easy and agree that a supplemental DEIS is not necessary." There is still concern that this narrow question will provide the CRC with an opening for interpretation and application to other decisions. For now, I think this provides what we need to complete the re-evaluation.

I still think we can craft the signature blocks with a little revision to reflect a co-federal lead decision process. (You know, turn the FTA document into a FTA/FHWA document). I'll work with Heather on that if it's OK with you.

-John

John McAvoy, PE
Major Project Manager
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610 E. 5th Ave.
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Cell: (503) 949-5980

-----Original Message-----
From: Saxton, James (FTA)
Sent: Tue 3/29/2011 7:03 AM
To: McAvoy, John (FHWA)
Subject: NEPA Experts

Any resolution with your NEPA experts?

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

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Sightline Institute

Disappearing Cars, Circa 2002



Northwest traffic started leveling out long before the recession began.

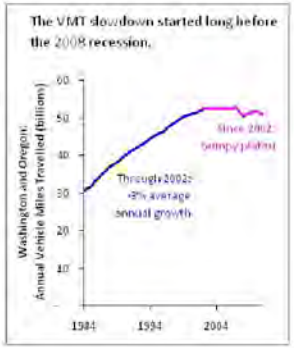
Clark Williams-Derry on August 8, 2011 at 12:03 pm

This post is 15 in the series: Dude, Where Are My Cars?

P-047-014 For months now, we've been tracking the fact that vehicle travel in the Northwest—both in general, and on specific urban highways—has been surprisingly flat for years, even decades.

One of the most common reactions to this news has been: *well, duh, there's a recession on.* A few folks have argued that once the recession lifts we'll see vehicle travel resume its steady ascent.

I think that misses the point of what we're finding. **The slowdown in vehicle travel started long, long before the current recession began.** In fact, it started back when the economy appeared to be humming along quite nicely.



The graph to the right shows it best. Total annual vehicle travel in Washington and Oregon grew steadily for many years. Then, in about 1999, growth started to moderate. And after a few years of slower-than-average increases, traffic volumes essentially plateaued in 2002.

Since 2008 we've seen driving dip, tick upward, and then dip again—which is perfectly consistent with what's happened with the economy and fuel prices.

But the interesting part of the story isn't the recent trends. It's what happened *about a decade ago* to make the VMT curve flatten out.

Remember, there was a bit of a recession in 2002—the year of the VMT plateau. But from 2002 through 2007, unemployment in the Northwest fell steadily, even as the population of Oregon and Washington grew at a steady clip.

But still, despite increases in both population and economic activity, VMT in the two states barely budged from 2002 until the recession began.

I'll leave it to some future PhD student to figure out precisely what caused the shift in VMT trends in the late 1990s and early 2000s. I have lots of theories:

Major urban highways hitting **capacity constraints**;

Increases in gas prices, coupled with a growing belief that gas prices wouldn't ever hit the lows of the late 1990s again;

Demographic changes, with more senior citizens and smaller families leading to less driving per person;

Land use shifts that let more people walk, bike, or take shorter, chained car trips for daily errands;

Possibly, declines in **new road construction**;

An increase in **flexible work schedules**, with more people working from home on some days;

The **internet** cutting back on shopping and/or work trips;

Cultural shifts that substituted tech toys for cars as objects of desire; and

Economic shifts, with fewer teens working (or looking for work) and widening income disparities that made it hard for some folks to pay for cars and gas.

Those are just theories; some are probably wrong. But regardless of the precise reasons, the trends themselves are clear enough. The

P-047-014 Where are my cars?" story doesn't simply follow the trajectory of the recession. It's a more complex story, with older roots.

Previous post in series:
« Washington's 700 Million Gallon Diet

Next post in series:
A Generational Shift In Driving? »

Read more in Land Use & Transportation

Comments

Eugene Wasserman says:
August 10, 2011 at 10:29 am

The major increase in the 1980's for vehicle miles traveled was from the increase of women moving in to the work force. That shows the step increase in vehicle miles traveled.

In the 2000 to 2010 years the City of Seattle lost 40,655 jobs, while the region outside Seattle gained 51,130 which would cause a plateau on urban highways.

Seattle's population growth was below the region's growth.

The plateau in the urban highway BMT's traveled are probably the result of the plateau of Seattle's population's growth and the major decrease in Seattle's employment.

Reply



Eric de Place says:
August 10, 2011 at 11:10 am

Eugene,

I don't follow your reasoning. The chart shows total VMT for Washington and Oregon combined, not for Seattle by itself.

If employment and population really did shift outside of Seattle (or other city centers) during the 2000s one would assume that would have exerted an upward pressure on VMT. So, in other words, the plateau in VMT starting in 2002 is even more remarkable.

Reply



SpencerPDX says:
August 11, 2011 at 1:48 am

In your list of potential reasons for declining VMT you might also consider adding a bullet point for environmental concerns.

The early 2K's is about when I started paying serious attention to troubling information about the impact of formerly fossilized carbon on climate. I imagine I'm not the only one.

Not that most of us (myself included) totally stopped driving because of this concern.

But where in the early nineties I saw driving as a fairly guilt-free activity that was a form of recreation in and of itself, now I tend to look at it as something I only do when the destination warrants it. And that mainly comes down to the fact that in the intervening years the burning of fossil fuels started to seem like an all-around bad idea, a thing to be avoided if possible. (Especially if an alternative like biking or walking is easy and pleasant.)

So while environmental concern might not lead to major behavior changes for most of us, it could contribute to a trend away from driving. This in much the same way that high gas prices won't entirely stop people from driving, but might make them think twice about it.

Reply



Clark Williams-Derry says:

August 11, 2011 at 7:09 am

P-047-014 That's a good point, Spencer! And I suppose we could add national security concerns as another possibility. After 9/11, a lot of folks who never think twice about the environment started thinking hard about the security implications of oil imports.

Reply

Eugene Wasserman says:
August 11, 2011 at 7:05 am

VMT's generally follow employment growth. So I cannot totally explain the plateau except to guess the as people and jobs move to the suburbs people are actually closer to their jobs. The other guess would be that as people sit in traffic they are driving less miles.

The decline would be the impact of gas prices which if I remembered correctly occurred before the recession.

Reply



Clark Williams-Derry says:
August 11, 2011 at 7:18 am

For the Northwest, I think it's fair to say that VMTs used to follow employment growth. But since the late 1990s they haven't – or at least, not consistently.

I agree that road capacity constraints in urban areas may be part of the story. But again, the trends are statewide, and not all roads in the major metro areas of the NW are clogged at rush hour. And besides, some roads started becoming capacity constrained long before 2002.

My sense is that the biggest determinant of the trends has been gas prices – which hit all time inflation-adjusted lows in about 1999, and have followed a bumpy upward path since then. A lot of those other trends may have their roots in gas prices.

Reply

Eugene Wasserman says:
August 12, 2011 at 9:25 am

It is important to take into account the increasing consultants and workers working out of their homes and the probably reduction of in store retailing because of Amazon.

Reply



SpencerPDX says:
August 19, 2011 at 9:40 pm

Another theory to add to the pile, this one from Ezra Klein:

"What could explain this cultural shift? Maybe more young people are worried about the price of gas or the environment. But—and this is just a theory—technology could play a role, too. Once upon a time, newly licensed teens would pile all their friends into their new car and drive around aimlessly. For young suburban Americans, it was practically a rite of passage. Nowadays, however, teens can socialize via Facebook or texting instead—in the Zipcar survey, more than half of all young adults said they'd rather chat online than drive to meet their friends"

http://www.washingtonpost.com/blogs/ezra-klein/post/why-are-americans-driving-less/2011/08/18/gIQALv7tNJ_blog.html

Reply

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Washington's 20 Billion Mile Diet



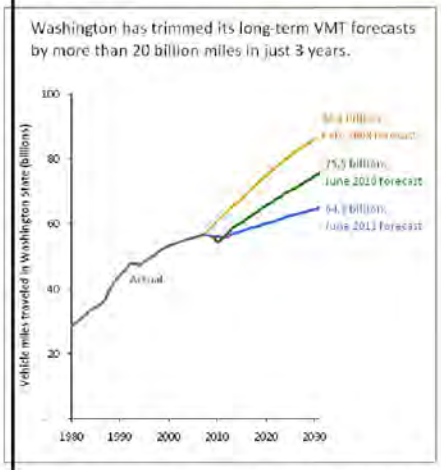
State traffic forecasts have changed radically in just three years.

Clark Williams-Derry on August 2, 2011 at 11:32 am

This post is 13 in the series: Dude, Where Are My Cars?

P-047-014 According to the most recent forecasts from the Washington State Office of Financial Management, drivers in Washington State will rack up about 65 billion miles on the highways in 2031.

I have no idea if that number is anywhere close to accurate. Nobody does. But what I do know is that the current estimate is 21 billion miles *lower* than the forecast that OFM made 3 years ago, and more than 10 billion miles lower than their forecast from just last year. The chart has the details:



It's awfully tempting to suggest this chart shows that OFM is gradually groping towards more realistic traffic projections.

But does it, really? To be honest, I don't actually know if the blue line is more "realistic" than the orange line. Sure, the blue line is more consistent with the actual traffic trends over the last decade--a period when annual VMT growth slowed to a crawl. But I don't have a crystal ball that tells me which of the three lines is the most "realistic" depiction of the future.

Instead, I think the real lessons of the chart lie elsewhere.

The first lesson is this: *nobody has any special insight into the future*. Future VMT trends aren't a feature of objective reality that smart people can sit in a room and puzzle out. They're just ***guesses***. Sometimes new information comes in, and the guesses change. Sometimes they change radically, enough to make the best guesses from a year earlier look ludicrous. So it's important to remember that even if particular forecast matches up with your world view, *it's still just a guess*.

Which leads to a second lesson: *nobody should take official VMT forecasts too seriously*. Three years ago, the "official" guess was that

P-047-014 here would be lots of new demand for road space, and lots of new gas tax revenue to pay for it. Today, the "official" guess is that statewide gas consumption peaked in 2002 or 2003, never to rise again; that gas tax revenues are going to decline unless the state ramps up the tax rate; and that the demand for new road space is going to slow to a crawl. Those are two completely contradictory views from the same agency in the same political administration. So all the hot air that was spewed about the dire need for new transportation megaprojects to avoid the near-certainty of a trafficopalypse showed nothing more than hubris, overconfidence, and a dismal understanding of how forecasting actually works.

And there's a third lesson here: *forecasts can be dangerous*. People have a tendency to take official forecasts awfully seriously. But the decisions we made three years ago that we "had" to put lots of new megaprojects into the pipeline, based on forecasts of massive gridlock in 20 years, could very easily turn out to be dreadfully costly mistakes. When we place too much confidence in any one forecast, we can wind up making terrible decisions.

To me, the rapid change in traffic forecasts argues for a new way to think about transportation investments: that we make them smaller, more versatile, more nimble, more creative, and less likely to lock us into huge long-term expenses for projects that we might not actually need. In short, it argues for an approach that's the *exact opposite* of all the multi-billion dollar bridges, tunnels, and highway expansions that are on the docket in the Northwest.

Previous post in series:
« WSDOT vs. Reality

Next post in series:
Washington's 700 Million Gallon Diet »

Read more in Land Use & Transportation

Comments

Southender says:
August 2, 2011 at 11:50 am

Great post as usual.

As a side note to actual state VMT, the most conservative estimate of the unrecovered costs of driving is $0.15/mile (source: FHWA) (a subsidy by any other name, but anyway...). If we were to asses just the most direct costs, Washington state and its communities would receive $9.75bn every year. That money would go a long way toward dealing with pavement condition, structurally deficient bridges, and even Sen Haugen's beloved ferries -- and would reduce a bit of VMT to boot.

Reply

Jim says:
August 2, 2011 at 10:14 pm

I've seen this graph before and it used to justify why we don't need the vast road infrastructure that the state is planning. I take the point that the WSDOT estimates are based on models and are just projections, but the obvious point hasn't been made. I don't know whether its justifiable, but I'll make the point anyway.

Doesn't the "rapid change in traffic forecasts" seem to correspond nicely to the drop in our economy and the shedding of jobs? Would it therefore suggest that these traffic improvements are not unnecessary when the economy returns, jobs return, and people begin commuting to work again?

Reply



Clark Williams-Derry says:
August 3, 2011 at 8:51 am

Jim-

The economy is definitely a major force in the trends from 2008.

It's possible that forecasters are feeling gloomy, and their long-term GDP growth forecasts have been affected by the short-term

P-047-014

economic woes.

But reading the numbers, VMT growth slowed WAY before the economy cratered. As I read things, it looks like the forecasts are moving towards a belief that "things in the future will look like they did from 2001-2007, rather than from 1992 through 2000." In some ways, what's happening is that an OLD vintage of super-over-optimistic forecasts that seemed reasonable in the 1990s is going away, and a NEW vintage of semi-optimistic forecasts that match the early 2000's is coming into force.

Here's what I think has changed in the models:

1) Forecasters now think that oil prices are going to remain high. As recently as 2008, ALL of the major oil forecasts showed oil prices at ~$30/barrel and roughly flat/declining as far as the eye can see. The runup that started in 2005 was seen as a temporary blip. But even though the economy is still struggling mightily, oil prices are high -- so high & ascending oil prices are now built into the models. (Incidentally, from what I've seen the models are based on assumptions that gas will be ~$3 per gallon).

2) Forecasters now better understand how consumers react to high gas prices. For a couple of decades, gas price blips had no appreciable effect on demand. When gas prices went from $1 to $1.20, nobody batted an eye everyone kept buying. So the "professional" opinion was that gas price elasticity was incredibly low -- people would continue to drive no matter how high prices got. But it seems that gas at $4 a gallon has really made a dent in people's appetite for travel. Elasticity is higher than people thought. Couple that with higher than expected gas prices, and you get a significant dampening effect on driving.

3) The understanding of demographics -- seniors driving less, fewer teens and young people working -- may have changed, altering long-term estimates of trip generation.

There are probably other factors. The important thing, though, is that the long-term projections now show that the future will be like 2001-2007, not like the roaring 1990s. That may still be too optimistic! But it's not *just* that the sour economy in 2011 is changing expectations for economic growth in 2030; it's also that the models are catching up to the reality of what was happening in the early 2000s.

Reply

Steve Erickson says:
August 3, 2011 at 10:25 am

These sorts of grossly inflated forecasts have disastrous consequences for long term planning and economics. Right now there are two different sewer projects being planned on Whidbey Island that are based on straight line projections of 10 year old OFM "high-mid" population forecasts that are demonstrably way higher than has actually occurred. This is the result of a combination of the lag in updating the County's GMA population forecasts, attributable to the lack of planning dollars available right now, and the boomers previously in power consistently choosing from the high end of OFM population forecasts, despite hindsight consistently showing that the reality was different. So, now Oak Harbor (current population: about 23,000) is planning a $60 million new sewage plant and the non-municipal urban growth area of Freeland (current population: about 4,000) is planning a $40 million sewer.

Looking at census data since 1970 reveals that since 1980 the rate of population increase has dropped by about 50% for each succeeding decade. If this long term trend continues the 2010-2020 population increase rate will be close to 0%. In fact, Island County has actually lost population (a bit over 3%) in the last 3 years. So, Whidbey and Camano Island may be about to achieve a steady state population or decline. This is something boomers just can't comprehend.

Reply

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WSDOT vs. Reality



Puget Sound traffic forecasts don't even pass the laugh test.

Clark Williams-Derry on July 13, 2011 at 1:15 am

This post is 12 in the series: Dude, Where Are My Cars?

P-047-014 I wish I were making this up. The Washington State Department of Transportation continues to insist that traffic volumes on the SR-520 bridge across Lake Washington are going up up up—even though actual traffic volumes have been flat or declining for more than a decade! Here's a chart that makes the point.



In a charitable mood, you could forgive the 1996 projections. Back then, rapid traffic growth on SR-520 was a recent memory: up through about 1988, traffic growth was both steady and rapid.

By 2011, however, it should have been perfectly obvious that the old predictions were proving inaccurate. Yet WSDOT just kept *doubling down on their mistakes*—insisting that their vision of the future remained clear, even as their track record was looking worse and worse. So now they've wound up with an official traffic forecast, in the final Environmental Impact Statement no less, that doesn't even pass the laugh test.

It would be funny—if the state weren't planning billions in new highway investments in greater Seattle, based largely on the perceived "need" to accommodate all the new traffic that the models are predicting will show up, any day now.

In case you don't believe me about the numbers, feel free to check out the sources directly. I'd be happy to be corrected.

The data on recent traffic volumes—the dark green dots—come from three sources. I start with WSDOT's biennial Ramp and Roadway Report. Then, to add in the missing years I factor in data from the Annual Traffic Report series and Seattle's Traffic Flow Data. The blue trend line is just the basic linear regression of the blue dots, as calculated by Excel.

The light orange line is based on a projection that dates back to 1996, which was mentioned in WSDOT's 1999 Trans-Lake Washington

P-047-014

study. Since that report is only available on CD-ROM, but not online, I'll quote the report directly:

> Under the No Action solution set, Trans-Lake travel [on SR-522, SR-520, and I-90] is expected to increase by about 168,000 daily person-trips...in the year 2020...because capacity is limited on SR 520, only about 20,000 additional vehicle...trips are expected there.

(If current trends hold, the projections of 20,000 additional vehicle trips will be off by about 20,000 additional vehicle trips.)

The green line is from the 2002 Trans-Lake Washington Project report, also available on CD-ROM, which projected that traffic under the "No-Action Alternative" would grow by 20 percent through 2030.

The dark orange line—127,400 cars by 2030—is from the recently released Final Environmental Impact Statement for the SR-520 bridge replacement project. It's based on the projections described in part 1 of the "transportation discipline report" (see Exhibit 5-3 on p. 92 of the pdf, and the projections for SR-520 at Midspan under the 2030 No Build Alternative: 127,400 vehicles by 2030).

I could have included another projection from the 2006 Draft Environmental Impact Statement—127,860 vehicles per day by 2030, as claimed in Exhibit 10-8 in Appendix R part 6. But it was getting hard to fit all the wrongness on a single chart.

Now, I know that total traffic volumes aren't the only traffic trends worth paying attention to. The traffic models make projections about peak-hour delays as well, which are probably what commuters care most about. But given that the models have proven so stubbornly and preposterously wrong about traffic volume trends, it's hard to believe that they have much of value to say about future traffic delays.

[Thanks to Jake Kennon and Pam MacRae for help with the numbers!]

Previous post in series:
← The Tolled Tunnel: Almost An Earthquake?

Next post in series:
Washington's 20 Billion Mile Diet →

Read more in Land Use & Transportation

Comments

Cheryl dos Remedies says:
July 13, 2011 at 11:36 am

This is WSDOT's reality: a 12-lane highway cutting through the Arboretum's wetlands, from Montlake to Foster Island.

It breaks down like this: 3 lanes of traffic + 2 lanes of ramps + 1 lane of shoulder x 2 = 12.

I'm not sure how to reconcile the traffic data above with what I know about this project, so Clark, I could use your help.

During peak hours, my understanding is that I-5 cannot handle the increased traffic of a 6-lane bridge, so WSDOT is planning 4 lanes of ramps in the Arboretum's wetlands to store cars as they try to merge onto I-5. This will prevent back-ups into the Montlake neighborhood and at the I-5 interchange itself.

Word on the street is that the "ramps will be removed from the Arboretum," but this just isn't true. It is true that the existing ramps that peel off and connect to Lake Washington Boulevard (LWB) will be eliminated, yet the negative impacts to the Arboretum increase. Here's how: WSDOT is planning for the new ramps placed in the wetlands to connect back into LWB, just at a point that is technically outside of the Arboretum. WSDOT expects highway traffic to increase through the heart of the Arboretum along LWB.

Under current federal regulations, we should not be able to bisect a historic park with highway traffic at all, but WSDOT leans on the state's "pre-existing conditions."

Watch this video and please pay especially close attention to 3:40 - 3:50 and 4:14 - 4:30: http://www.youtube.com/watch?v=nCY7COUSs0k

And next time you are on I-5, count the lanes and imagine that swath pavement cutting through the Arboretum. Imagine kayaking in the Arboretum with 12 lanes of highway overhead.

12 lanes of highway to store idling cars in Seattle's most pristine wetlands. . . this is WSDOT's reality? This is insane.

Reply

Randy says:
July 13, 2011 at 1:01 pm

P-047-014 Bottom line, Seattle and WSDOT have no clue what they're doing. If you think effective traffic management is creating HOV lanes in on ramps and going from 6 lanes to 2 lanes downtown is effective, you're high. Even the express lanes aren't express any more. When it takes 45 minutes to get across either the 90 or 520 bridge, it is obvious there is no planning. There was no plan for traffic management in Seattle and I've lived in much larger cities where traffic wasn't half as aggravating. Add to the poor planning drivers who have NO clue how to drive and it all becomes a pile of mess.

I challenge anyone to figure out how to get the appropriate amount of traffic across any highway in this town all the while focusing on the environment. It can't be both ways. We can't expect to fix traffic issues and keep ALL environmentalists happy. It seems to me all the idling I do on the highway is worse for the environment.

Reply

archie says:
July 13, 2011 at 8:05 pm

Congestion pricing.

Reply



Clark Williams-Derry says:
July 14, 2011 at 2:29 am

bingo.

G-Man (Type E) says:
July 15, 2011 at 12:16 pm

No one will pay for congestion. They get plenty of it for free already.

How about "De-congestion price" or "free-flowing lanes charge" or "guaranteed travel time price" or anything else that accurately conveys that concept? How about instead of saying we want to toll or price a highway, we say we would like to sell commuters access to guaranteed free-flowing lanes. Focus on the benefit, and to support projects like pricing I-5 express lanes, let's trot out the evidence from other cities that this actually improves traffic flow in adjacent non-tolled lanes as well.

Randy,
If we add an extra lane you will pay more taxes or tolls for 30 years on an improvement that alleviates your idling for maybe 5 years max. After that congestion would be back to today's levels but with a higher cost to clean air, water and land. If we used variable tolls you would pay daily at your own discretion. A sign could say - this lane $5 / 15 minutes, that lane free / 30 minutes and you make your choice. How's that for freedom? (for the 520, your free alternative would be I-90 and any smartphone now can tell you the time difference). Variable tolls that assure travel time also mean faster, more reliable buses - means more people using them - means less competition on the road from other drivers - means lower tolls and a faster commute for you - a virtuous circle! You're wrong to think there isn't a solution - there is always a path to progress if we are bold enough to act without fear, grounded in solid evidence of the real relationships that shape our world.

Danny says:
July 25, 2011 at 2:12 pm

WSDOT already has some congestion pricing in place, why not bring it to Seattle?
http://www.wsdot.wa.gov/NR/rdonlyres/A43B9DD4-4228-482E-8F82-CEE3198315A0E/69595/2ndAnnualReport_I67HOTLanes2.pdf

P-047-014

Paul Sirkeland says:
July 13, 2011 at 2:58 pm

Well, Clark, as Kurt Vonnegut might have said, "Hi ho!"

I actually derive some hope here. If in the face of explosive growth in Redmond and at Microsoft over the last 16 years, and in the face of such moderate gas prices and overall population growth we still managed to reduce traffic volume, it makes me believe that there is some fundamental dynamic driving us (no pun intended) to drive less. Not sure what it is, but its impact is a positive one, and perhaps unstoppable.

As far as the DOT models go, I would wonder exactly how they were built. Typically models like that are not just linear extrapolations from the past. They are usually 'build ups' of various economic projections - this much freight traffic, this much commercial traffic, this much commuter traffic, etc. You add them up and get your total.

So what in the DOT models didn't happen, and why? Are we telecommuting more? Is freight going somewhere else? Is commercial activity developing in a different geographic pattern than projected?

Answers like that would substantiate the fallacy of the models, and perhaps lead to improvements that might yield more accurate estimates of future traffic.

Nice work here, Clark.

Paul

Reply



Clark Williams-Derry says:
July 13, 2011 at 3:17 pm

Paul - I don't pretend to be an expert on the models. But the PSRC travel model is basically a "4 step" model. Step 1 is to estimate demand for trips, based on projections of population, income, employment, fuel costs, and other economic/demographic factors. Step 2 is figure out where the trips go, based on a "gravity model" of the attractiveness of various destinations. Step 3 is to assign mode, and step 4 assigns routes.

My working hypothesis – which is really no more than a guess – is that step 1 isn't working well. Despite income & growth, we're not generating as many trips per person as we used to. I agree, that's a good thing overall, but some of the big causes aren't all good: high gas prices that cause economic hardship to families; lower-than-anticipated employment, particularly in certain demographics; etc. Regardless of the reasons, total VMT trends aren't moving the way people were anticipating they would. Things have changed. Will they change back? Who knows?!

But I also sense that there's something broken in Step 2. That is, the models overestimate the "attractiveness" of crossing 520. The models suggest that people should be lining up earlier & earlier to get to jobs & stores on the other side of the lake. Maybe they are – but if so, it's not reflected in total traffic volumes. And it seems to me that the flaws with the trip distribution step of the model surfaced long before the mid 2000's, when gas prices started to rise in earnest.

Reply

DJStroky says:
July 13, 2011 at 4:38 pm

Step 4 is where the bulk of the error comes from in my opinion. Most models won't immediately stop assigning traffic onto a road if the volume/capacity ratio goes over 1.

I think the real reason traffic hasn't grown on 520 is that it has been completely at capacity for the last 10 years or more. And not just 520, wherever there are roads that are completely clogged no growth ought to be expected.

Carl says:
July 15, 2011 at 12:08 pm

Then when we create new capacity on 520, there will be induced demand to drive it since it will be easier.

I wonder whether DOT has modeled the effects of tolling, or whether people understand that it is $7 round trip in peak times

P-047-014



Clark Williams-Derry says:
July 15, 2011 at 3:20 pm

Carl
I agree. I think that it's likely that if the bridge were widened and had no tolls, it would quickly get saturated with additional traffic.

Eric Doherty says:
July 13, 2011 at 5:42 pm

If I remember correctly it was General Motors that funded the development of 4-step traffic models.

Someone less polite than me might say that computer assisted BS is still BS. Good thing I am so polite and would never say such things.



Clark Williams-Derry says:
July 13, 2011 at 4:57 pm

DJStoky -
Good point. Maybe a synthesis: the results of step 4 don't get fed back into step 2. When roads get full (step 4) the increased travel times aren't properly factored back into the "attractiveness" of the affected destinations (step 2).

Reply

Levin Nock says:
July 15, 2011 at 10:27 pm

What will it take for the transportation planning industry to update the industry standard of modeling to include things like feedback loops, verification and calibration? A masters student would be flunked for a thesis with such woefully inadequate modeling, yet we continue to invest billions of dollars based on this "guidance".

Levin Nock says:
July 15, 2011 at 11:05 pm

Based on Rob's message below, it sounds like the actual models are quite sophisticated, but the results are usually labeled incorrectly. Has anybody seen a traffic forecast chart labeled "Number of trips that people wish they could take, in the absence of any congestion or congestion pricing"? I've never seen it. The word "forecast" suggests that the forecaster expects something to actually happen not that they expect people to wish for something that will never happen.

Ellin says:
July 13, 2011 at 3:27 pm

As you calculate the width of the new Floating Bridge (Stage 1, said to be funded) and the new West Approach Bridge (Stage 2, unfunded), note the additional 14-foot lane for the bicycle/pedestrian path, 10 foot shoulders, 11-foot general purpose lanes, 12-foot HOV lanes, all capable of being restriped for more lanes, and a gap ranging from 35 to 40 or so feet reserved for Light Rail between the "North Bridge" and the "South Bridge." WSDOT's Request for Proposals (RFP) is for a "Future Six-Lanes Plus Two HCT Configuration, not for a Four-Lanes Plus Two HOV Lanes to be converted to HCT later. See the RFP on WSDOT's site.

Reply

Rob says:
July 14, 2011 at 9:46 pm

This is a good observation, but not difficult to explain in modeling terms. Transportation models (all of them, not just WSDOT's, which is also the PSRC's) attempt to model demand, not throughput. In real life, traffic on both I-90 and SR 520 has been constrained by capacity

P-047-014

a long time. Eastbound and westbound traffic is about equal, not because there's equal demand each way, but because capacity limits have been reached in both directions. So yes, traffic's not likely to grow a lot more with the current facility – but that doesn't mean there aren't lots of people who would cross the lake if it weren't so onerous.

There is a volume-delay curve in the model that attempts to show how traffic will slow if demand exceeds capacity, but it's not perfect. When the model is calibrated to current conditions, it's tweaked until it produces results that match current volumes, so it's forced to show demand equal to throughput. But as population and employment grow in the future, the model will try to add trips incrementally throughout the network, so it's likely to show some growth. This effect is most pronounced for cross-lake trips, since there are no alternative routes to the two cross-lake highways. In other places the model is more successful finding other routes to move the demand to.

Demand has also been slowing recently because of the prolonged recession. The most effective transportation demand management strategy remains to wreck the economy – but it's not clear that's a good strategy to plan for over the longer term. Also, if 520 is widened, even for HOV, there will be more throughput because (1) there is a ton of latent demand there, and (2) in addition to increased capacity, just having shoulders will stop breakdowns and wrecks to bring traffic to a halt.

I think the take-away from this should be that model results should always be accompanied with a primer on modeling limitations. They aren't perfect, and every modeler will be honest about that. In real life traffic probably won't increase if the bridge isn't expanded, and it will get only marginally more congested. But more people will "wish" they could cross the lake than will be able to, and whether it's a good or bad thing to accommodate them is a policy choice, not a technical issue.

Reply



Clark Williams-Derry says:
July 14, 2011 at 10:31 pm

I totally agree with you about the limits of models – and that responsible modelers are always careful to respect those limits. If only we could get everyone to read a treatise on modeling limits (along with examples of obvious failure) before they were even allowed to contemplate model outputs, the world might be a better place.

But unfortunately, I'd argue that's not even close to the role that modeling plays in the public debate. Instead, politicians and project boosters treat model outputs as near-certain predictions of perpetual gridlock. In fact, I'd argue that the models underpin & prop up a broad and deeply flawed consensus about how travel habits change over time.

Which brings up a question – should we even bother to use models in a case like 520? The current crop of models is simply useless at predicting actual traffic trends, and the near-universal misinterpretation of model outputs deeply distorts the debate.

If politicians had the courage to say "we are building a wider bridge because we think that a lot of people would like to drive on it," we'd have an honest debate about the costs & benefits. But instead they say "ZOMG you'll all be stuck in traffic armageddon!!! I know it's true because....models!" And we wind up building more megaprojects than we need, paid for by people who don't see much benefit from them.

Reply

Levin Nock says:
July 16, 2011 at 7:41 am

It appears that the calibration process fudges the model, to pretend that the model is related to reality. Since 1996 and before, there have been plenty of people wishing they could travel more on 520; even in 1996, 2002 and 2011 when WSDOT pretended there were none. Since WSDOT wants to model wishes, rather than actual traffic, they should draw a horizontal line up around 200,000 or 300,000 or somewhere above, sloping gently upward, to make crystal clear that the only way to address this demand is with light rail and commuter rail, or possibly complete networks of free-flowing bus lanes and cycle paths.

Reply

Jessica says:
July 15, 2011 at 11:30 am

Clark, do you have data (and free time) to add actual traffic volumes from earlier years? I'd like to see when the downward trend started and whether the slopes of WSDOT's estimates have ever matched actual traffic growth. That is, has traffic ever grown that fast? If so, how long ago?

Thanks for this post-it's exactly why I donate to Sightline every month!

Reply

Jesse says:
July 15, 2011 at 7:24 pm

P-047-014 I now we need some increased capacity, but I'd rather that errored on the side of shoulders and HOV lanes. Those by themselves would double the size of 520 and probably greatly increase throughput.
But as I love to quote an Orlando traffic engineer: "Widening roads to solve traffic congestion is like loosening your belt to cure obesity."

Reply

Levin Nack says:
July 16, 2011 at 7:20 am

Here's a corollary:
"Forecasting Seattle traffic while assuming there's no congestion is like forecasting Seattle weather while assuming there's no rain."
It's not very useful, and it just might be misleading.

Reply

Southender says:
July 18, 2011 at 12:54 pm

People have commented that the translake connections are capacity constrained, which may have some merit with 520, though volumes and hours of delay are decreasing. Latent demand would likely absorb the freed up capacity if that were true.

Also, the I-90 bridge was forcast to have significant increases in traffic volume, which it has the capacity to sustain. Likewise, the models have significantly overestimated the ADT and peak-hour volumes there as well.

With the trends begining a long-term reversal in 1996, especially when compared to regional population growth, it's also hard to argue that the effect of either of the two recessions that happenend over that time-period is solely or even largely responsible for the decline.

Reply

Bryan says:
July 19, 2011 at 3:01 pm

I would think it would be readily apparent to everybody (but apparently it is not) that the reason traffic has been trending down is because natural changes to the structure of growth occured due to the restriction that seattle traffic placed upon that growth.

In most other cities you would see the core grow as whole local economy grew. Financial, shopping, etc would typically grow in the core as the outer businesses grew. So compare those traffic projects to Bellevue growth during that time. The growth of Bellevue could largely be attributed to the utter lack of access to downtown Seattle provided by the capacity of 520 and 90 (as well as horrible I-5 connections at their western termination).

Reply

Ralphus says:
July 19, 2011 at 9:48 pm

Using a linear regression to predict future traffic volumes from historic ones is a deeply flawed methodology. In fact, it is the almost assuredly the same methodology WSDOT used to generate the inaccurate growth predictions you're discussing (although perhaps using a longer time frame or area-wide figures). Maybe volumes really will not display much growth, as you predict, but a linear regression is not much proof of that.

Also, I thought clarification on the actual base-data in your graph might be pertinent. WSDOT's Ramp and Roadway Report provides Average Weekday Traffic (AWDT) volumes reflecting Tuesday through Thursday. This data is almost exclusively drawn from electronics in the roadway that are primarily purposed for real-time traffic management. However, most statistics in the Annual Traffic Report are

P-047-014 nual Average Daily Traffic (AADT) volumes reflecting Sunday through Saturday. This data is drawn from the WSDOT HQ traffic counting program, which is designed to collect data for planning purposes. Because weekday volumes are almost always higher than Sunday through Saturday averages, the statistics found in these two sources are not comparable. The only exception would be for the 150 or so permanent traffic recorders for which data is provided in the Annual Traffic Report. For these recorders (which are the most accurate that WSDOT has at its disposal) both AADTs and AWDTs are provided. One of these is on the 520 bridge, and is listed in the Annual Traffic Report as recorder D10. The AWDTs for this recorder are listed below, although the older ones need to be requested from WSDOT since AWDTs were not carried in the report until 2001.

2009 : 106599
2008 : 105994
2007 : 107040
2006 : 108237
2005 : 111035
2004 : 110293
2003 : 110524
2002 : 109719
2001 : 110541
2000 : 111786
1998 : 112671
1997 : 111281
1996 : 108719
1995 : 110094

Reply



Clark Williams-Derry says:
July 21, 2011 at 4:10 am

Ralphus-

It seems like you think that the dark green line is a prediction. This line is nothing more than a regression, describing the past trends. I'm not offering my own predictions here – only an observation that past predictions haven't held up.

Reply

Ron Richings says:
July 25, 2011 at 2:08 pm

I don't have a problem with your basic critique, but the graph that you used is really a bit misleading by virtue of eliminating the scale below 90,000. If you presented the full graph down to the zero base what now looks like a fairly vast discrepancy would instead look, correctly, like a relatively small proportion of complete traffic estimates.
I know, I know, people often use only sections of graphs to help illustrate their points, but it is really bad practise when used to give an overall impression for general public consumption.

Reply

Rhys Roth says:
July 26, 2011 at 3:37 pm

On the other hand, what really matters in terms of rationalizing expansion of the bridge is how much ADDITIONAL traffic is expected when. From that standpoint, Clark's graph focuses exactly on the essential information and does put it in proper perspective.

Reply

Stu Ramsey says:
July 26, 2011 at 3:56 pm

Wow, it's not everyday you see an extened discussion of the weaknesses of transportation models! I used to make a comfortable living

P-047-014

...nning this exact type of model, and I agree with many of the concerns raised. The models inherently assume that people will make the same decisions in the future that they did in the past. And that all trips will be completed, no matter how congested the network gets.

By and large, modellers spend a lot of time agonizing over small modelling questions (will this road have a capacity of 600 or 700 vehicles per hour?) and ignoring the larger ones (will there be carbon pricing? will the built environment encourage more active modes?).

For the truly dedicated student, I discuss these questions on my web site. You can go to http://www.transportplanet.ca/presentations.htm and scroll down slightly to the various links for "Of Mice and Elephants". Your choice of PowerPoint file, 40-minute video, or peer-reviewed technical (but still readable) article.

Among other things, I concur with Clark's statement that there are times when we would be better off to not run the model at all.

Reply

political_incorrectness says:
August 18, 2011 at 1:59 pm

They are trying to pull a George Massey tunnel with 520. 6 lanes to 2 never works and ends up forming one giant queue. Also, this might have negative consequences with I-5 southbound which suffers from chronic congestion from Lake City Way to the Ship Canal Bridge after the express lanes change over. Realistically, I-5 will probably need to be rebuilt for a 4x2x2x4 configuration in order to get the best throughput. It will be damn expensive but I think that is probably the best way to do it if I-5 is rebuilt. If they are expecting Eastside growth, they should probably allow transit expansion across the bridge. I find it disturbing that some believe the express lanes on I-90 provide valuable capacity when they are merged at the very end and only cause congestion later.

Reply

Dave says:
August 26, 2011 at 9:45 am

I think the heart of the matter here is a questions of how one manages the uncertainty of the future. Forecasts are not predictions of the future so much as they are risk management tools.

I completely agree that the trendline forecasts typically assume future trends will basically match the past. I'm working on the update to the GMA Transportation Element guidebook right now and one of the main new themes I'm trying to develop is how to manage uncertainty. Many have observed that our ability to predict the future based on the past is significantly less now that it was 20 years ago. If any of you care to visit the project webe site, I'd be very interest in your comments. We are releasing preliminary drafts chapter-by-chapter, with a final draft coming after that.

Reply

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Sightline Daily
News & Views for a Sustainable Northwest

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Dude, Where Are My Cars: Multnomah County



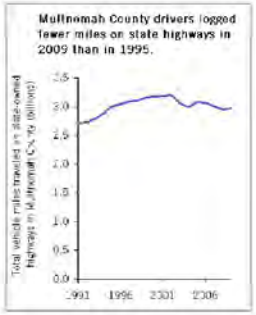
In Oregon's most populous county, there was less driving on state highways in 2009 than 1995.

Clark Williams-Derry on October 3, 2011 at 3:11 pm

This post is 18 in the series: Dude, Where Are My Cars?

P-047-014

Continuing my obsession with flat-lining traffic trends, here's a chart showing that drivers in Multnomah County--Oregon's most populous county, and home to Portland--logged fewer miles on state-owned highways in 2009 than they did in 1995. Traffic volumes on those roads hit their all-time peak in 2002.



The numbers all come from the Oregon DOT website (here's a link to the actual spreadsheet with county-level VMT figures).

What puzzles me is: why aren't the facts about flat traffic trends more widely known? It's not like they're particularly new; throughout the northwest, traffic growth has been defying predictions for well over a decade. Yet still, many folks who ought to know the trends are disinclined to believe them.

For example, one of the most common reactions (including an unflattering comment by an *Oregonian* reporter) to our report last month on Peak Gas--which showed that gasoline consumption in Oregon and Washington flattened out in 1999--was that the trend was largely caused by gains in the fuel efficiency of cars and trucks.

The thing is, *that's not actually true*.

For much of the period of "peak gas," the light-duty vehicle fleet was actually getting *less* efficient. Through the mid-2000s, the auto industry was focusing its technology improvements on increasing horsepower, not improving fuel efficiency. Meanwhile, sales of SUVs, minivans, and pickup trucks were gradually edging out cars. Between these two trends, the fuel efficiency of new light-duty vehicles fell fairly steadily from 1987 all the way through 2004. It was only in 2007 or so, after SUV sales had cooled a bit, that the average new vehicle was as efficient as the one it was replacing. (See this Department of Energy spreadsheet for details.)

So saying that a decade's worth of flat gas consumption was due to improving vehicle efficiency is simply an error; the trend included a long period of declining average mpg, and a shorter period, particularly after 2008, when the average mpg of the vehicle fleet improved. For the most part, the trend of flat-lining gas consumption is explained by the flat-lining in state-wide VMT.

To me, what this points out is the danger of relying on intuition and hearsay instead of hard data. Intuition says that we're driving more than ever, so any declines in gas consumption *must* be due to more efficient vehicles. Reality, however, tells a different story: person for person, we're driving less; total vehicle travel is holding roughly steady; and the gains in vehicle efficiency have been real, but more modest and more recent than you might think.

Previous post in series:
- Peak Gas Hits Oregon

Comments

rex burkholder says:

October 7, 2011 at 10:43 am

P-047-014 An interesting area to investigate for you is that, within the Metro region, there has been very little addition to the state highway network in the last 10 years. I would daresay that in Multnomah County, actual miles in the state system have declined as local governments assume control of large sections of state highways, including MLK Blvd (ex-99E), Sandy (ex-30).

There is also the phenomena, seen on the I-5 crossing data, that roads do fill up, and more vehicles on the road is just physically impossible as well as deterring to additional traffic.

We shouldn't be surprised that we get flat lining of traffic growth on a facility when we've stopped adding to the size of those facilities. I'd be interested in what has happened in WA state which has had the money and the push to add lots of new capacity in the last 10 years. Is driving plateauing???

Reply

Jesse says:
October 7, 2011 at 2:12 pm

Rex,
Check out the rest of the "Dude, Where's My Cars?" series. Most is about Washington.

Reply

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TECHNICAL ADVISORY

GUIDANCE FOR PREPARING AND PROCESSING ENVIRONMENTAL AND SECTION 4(F) DOCUMENTS

T 6640.8A
October 30, 1987

P-047-014

1. PURPOSE. To provide guidance to Federal Highway Administration (FHWA) field offices and to project applicants on the preparation and processing of environmental and Section 4(f) documents.

2. CANCELLATION. Technical Advisory T 6640.8, "Guidance Material for the Preparation of Environmental Documents," dated February 24, 1982, is canceled effective on November 27, 1987.

3. APPLICABILITY

   a. This material is not regulatory. It has been developed to provide guidance for uniformity and consistency in the format, content, and processing of the various environmental studies and documents pursuant to the National Environmental Policy Act (NEPA), 23 U.S.C.109(h) and 23 U.S.C. 138 (Section 4(f) of the DOT Act) and the reporting requirements of 23 U.S.C. 128.

   b. The guidance is limited to the format, content and processing of NEPA and Section 4(f) studies and documents. It should be used in combination with a knowledge and understanding of the Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (40 CFR 1500-1508), FHWA's Environmental Impact and Related Procedures (23 CFR 771) and other environmental statutes and orders (see Appendix A).

   c. This guidance should not be used until November 27, 1987, the effective date of the 1987 revisions to 23 CFR 771.

Ali F. Sevin
Director, Office of
Environmental Policy

GUIDANCE FOR PREPARING AND PROCESSING ENVIRONMENTAL AND SECTION 4(F) DOCUMENTS

Background

An earlier edition of this advisory (dated February 24, 1982) placed major emphasis on environmental impact statements (EISs) and provided limited guidance on environmental assessments (EAs) and other environmental studies needed for a categorical exclusion (CE) determination or a finding of no significant impact (FONSI). The revised guidance gives expanded coverage to CE determinations, EAs, FONSIs, EISs, supplemental EISs, reevaluations, and Section 4(f) evaluations. This material is not regulatory. It does, however, provide for uniformity and consistency in the documentation of CEs and the development of environmental and Section 4(f) documents.

The FHWA subscribes to the philosophy that the goal of the NEPA process is better decisions and not more

P-047-014

documentation. Environmental documents should be concise, clear, and to the point, and should be supported by evidence that the necessary analyses have been made. They should focus on the important impacts and issues with the less important areas only briefly discussed. The length of EAs should normally be less than 15 pages and EISs should normally be less than 150 pages for most proposed actions and not more than 300 pages for the most complex proposals. The use of technical reports for various subject areas would help reduce the size of the documents.

The FHWA considers the early coordination process to be a valuable tool in determining the scope of issues to be addressed and in identifying and focusing on the proposed action's important issues. This process normally entails the exchange of information with appropriate Federal, State and local agencies, and the public from inception of the proposed action to preparation of the environmental document or to completion of environmental studies for applicable CEs. Formal scoping meetings may also be held where such meetings would assist in the preparation of the environmental document. The role of other agencies and other environmental review and consultation requirements should be established during scoping. The Council on Environmental Quality (CEQ) has issued several guidance publications on NEPA and its regulations as follows: (1) "Questions and Answers about the NEPA Regulations," March 30, 1981; (2) "Scoping Guidance," April 30, 1981; and (3) "GuidanceRegarding NEPA Regulations," July 28, 1983. This nonregulatory guidance is used by FHWA in preparing and processing environmental documents. Copies of the CEQ guidance are available in the FHWA Office of Environmental Policy (HEV-11).

Note, highway agency (HA) is used throughout this document to refer to a State and local highway agency responsible for conducting environmental studies and preparing environmental documents and to FHWA's Office of Direct Federal Programs when that office acts in a similar capacity.

SECTION SUBJECT

I Categorical Exclusion (CE) 4
II Environmental Assessment (EA) 6
III Finding of No Significant Impact (FONSI) 9
IV Distribution of EAs and FONSIs 10
V EIS -- Format and Content 11
Cover Sheet 11
Summary 12
Table of Contents. 13
Purpose of and Need for Action 13
Alternatives 15
Affected Environment 18
Environmental Consequences 19
Land Use Impacts 20
Farmland Impacts 21
Social Impacts 21
Relocation Impacts. 23
Economic Impacts 24
Joint Development 25
Considerations Relating to Pedestrians and Bicyclists 25
Air Quality Impacts 26
Noise Impacts 28
Water Quality Impacts 29
Permits 30
Wetland Impacts 31
Water Body Modification and Wildlife Impacts. . 33
Floodplain Impacts. 33
Wild and Scenic Rivers. 35
Coastal Barriers 35
Coastal Zone Impacts 36
Threatened or Endangered Species 37
Historic and Archeological Preservation 39
Hazardous Waste Sites 40
Visual Impacts 41
Energy 41
Construction Impacts 42
Relationship of Local Short-term Uses vs. Long-term Productivity 42
Irreversible and Irretrievable Commitment of Resources 43

P-047-014

List of Preparers 44
List of Agencies, Organizations and Persons to Whom Copies of the Statement are Sent 44
Comments and Coordination 44
Index 45
Appendices 45
VI Options for Preparing Final EISs 46
VII Distribution of EISs and Section 4(f) Evaluations 48
VIII Record of Decision -- Format and Content 50
IX Section 4(f) Evaluations -- Format and Content 52
X Other Agency Statements 56
XI Reevaluations 57
XII Supplemental EISs 59
XIII Appendices: 60

. CATEGORICAL EXCLUSION (CE)

Categorical exclusions are actions or activities which meet the definition in 23 CFR 771.117(a) and, based on FHWA's past experience, do not have significant environmental effects. The CEs are divided into two groups based on the action's potential for impacts. The level of documentation necessary for a particular CE depends on the group the action falls under as explained below.

A. Documentation of Applicability

The first group is a list of 20 categories of actions in 23 CFR 771.117(c) which experience has shown never or almost never cause significant environmental impacts. These categories are non-construction actions (e.g., planning, grants for training and research programs) or limited construction activities (e.g., pedestrian facilities, landscaping, fencing). These actions are automatically classified as CEs, and except where unusual circumstances are brought to FHWA's attention, do not require approval or documentation by FHWA. However, other environmental laws may still apply. For example, installation of traffic signals in a historic district may require compliance with Section 106, or a proposed noise barrier which would use land protected by Section 4(f) would require preparation of a Section 4(f) evaluation (23 CFR 771.135(i)). In most cases, information is available from planning and programming documents for the FHWA Division Office to determine the applicability of other environmental laws. However, any necessary documentation should be discussed and developed cooperatively by the highway agency (HA) and the FHWA.

The second group consists of actions with a higher potential for impacts than the first group, but due to minor environmental impacts still meets the criteria for categorical exclusions. In 23 CFR 771.117(d), the regulation lists examplesof 12 actions which past experience has found appropriate for CE classification. However, the second group is not limited to these 12 examples. Other actions with a similar scope of work may qualify as CEs. For actions in this group, site location is often a key factor. Some of these actions on certain sites may involve unusual circumstances or result in significant adverse environmental impacts. Because of the potential for impacts, these actions require some information to be provided by the HA so that the FHWA can determine if the CE classification is proper (23 CFR 771.117(d)). The level of information to be provided should be commensurate with the action's potential for adverse environmental impacts. Where adverse environmental impacts are likely to occur, the level of analysis should be sufficient to define the extent of impacts, identify appropriate mitigation measures, and address known and foreseeable public and agency concerns. As a minimum, the information should include a description of the proposed action and, as appropriate, its immediate surrounding area, a discussion of any specific areas of environmental concern (e.g., Section 4(f), wetlands, relocations), and a list of other Federal actions required, if any, for the proposal.

The documentation of the decision to advance an action in the second group as a CE can be accomplished by one of the following methods:

1. Minor actions from the list of examples:

P-047-014

Minor construction projects or approval actions need only minimum documentation. Where project-specific information for such minor construction projects is included with the Section 105 program and clearly shows that the project is one of the 12 listed examples in Section 771.117(d), the approval of the Section 105 program can be used to approve the projects as CEs. Similarly, the three approval actions on the list (examples (6), (7) and (12)) should not normally require detailed documentation, and the CE determination can be documented as a part of the approval action being requested.

2. Other actions from the list of examples:

   For more complex actions, additional information and possibly environmental studies will be needed. This informationshould be furnished to the FHWA on a case-by-case basis for concurrence in the CE determination.

3. Actions not on the list of examples:

   Any action which meets the CE criteria in 23 CFR 771.117(a) may be classified as a CE even though it does not appear on the list of examples in Section 771.117(d). The actions on the list should be used as a guide to identify other actions that may be processed as CEs. The documentation to be submitted to the FHWA must demonstrate that the CE criteria are satisfied and that the proposed project will not result in significant environmental impacts. The classification decision should be documented as a part of the individual project submissions.

4. Consideration of Unusual Circumstances

   Section 771.117(b) lists those unusual circumstances where further environmental studies will be necessary to determine the appropriateness of a CE classification. Unusual circumstances can arise on any project normally advanced with a CE; however, the type and depth of additional studies will vary with the type of CE and the facts and circumstances of each situation. For those actions on the fixed list (first group) of CEs, unusual circumstances should rarely, if ever, occur due to the limited scope of work. Unless unusual circumstances come to the attention of the HA or FHWA, they need not be given further consideration. For actions in the second group of CEs, unusual circumstances should be addressed in the information provided to the FHWA with the request for CE approval. The level of consideration, analysis, and documentation should be commensurate with the action's potential for significant impacts, controversy, or inconsistency with other agencies' environmental requirements.

   When an action may involve unusual circumstances, sufficient early coordination, public involvement and environmental studies should be undertaken to determine the likelihood of significant impacts. If no significant impacts are likely to occur, the results of environmental studies and any agency and public involvement should adequately support such a conclusion and be included in the request to the FHWA for CE approval. If significant impacts are likely to occur, an EISmust be prepared (23 CFR 771.123(a)). If the likelihood of significant impacts is uncertain even after studies have been undertaken, the HA should consult with the FHWA to determine whether to prepare an EA or an EIS.

XIII. ENVIRONMENTAL ASSESSMENT (EA)

The primary purpose of an EA is to help the FHWA and HA decide whether or not an EIS is needed. Therefore, the EA should address only those resources or features which the FHWA and the HA decide will have a likelihood for being significantly impacted. The EA should be a concise document and should not contain long descriptions or detailed information which may have been gathered or analyses which may have been conducted for the proposed action. Although the regulations do not set page limits, CEQ recommends that the length of EAs usually be less than 15 pages. To minimize volume, the EA should use good quality maps and exhibits and incorporate by reference and summarize background data and technical analyses to support the concise discussions of the alternatives and their impacts.

P-047-014 The following format and content is suggested:

A. Cover Sheet.

There is no required format for the EA. However, the EIS cover sheet format, as shown in Section V, is recommended as a guide. A document number is not necessary. The due date for comments should be omitted unless the EA is distributed for comments.

B. Purpose of and Need for Action.

Describe the locations, length, termini, proposed improvements, etc. Identify and describe the transportation or other needs which the proposed action is intended to satisfy (e.g., provide system continuity, alleviate traffic congestion, and correct safety or roadway deficiencies). In many cases the project need can be adequately explained in one or two paragraphs. On projects where a law, Executive Order, or regulation (e.g., Section 4(f), Executive Order 11990, or Executive Order 11988) mandates an evaluation of avoidance alternatives, the explanation of the project need should be morespecific so that avoidance alternatives that do not meet the stated project need can be readily dismissed.

C. Alternatives.

Discuss alternatives to the proposed action, including the no-action alternative, which are being considered. The EA may either discuss (1) the preferred alternative and identify any other alternatives considered or (2) if the applicant has not identified a preferred alternative, the alternatives under consideration. The EA does not need to evaluate in detail all reasonable alternatives for the project, and may be prepared for one or more build alternatives.

D. Impacts.

For each alternative being considered, discuss any social, economic, and environmental impacts whose significance is uncertain. The level of analysis should be sufficient to adequately identify the impacts and appropriate mitigation measures, and address known and foreseeable public and agency concerns. Describe why these impacts are considered not significant. Identified impact areas which do not have a reasonable possibility for individual or cumulative significant environmental impacts need not be discussed.

E. Comments and Coordination.

Describe the early and continuing coordination efforts, summarize the key issues and pertinent information received from the public and government agencies through these efforts, and list the agencies and, as appropriate, members of the public consulted.

F. Appendices (if any).

The appendices should include only analytical information that substantiates an analysis which is important to the document (e.g., a biological assessment for threatened or endangered species). Other information should be referenced only (i.e., identify the material and briefly describe its contents).

G. Section 4(f) Evaluation (if any).

If the EA includes a Section 4(f) evaluation, the EA/Section 4(f) evaluation or, if prepared separately, the Section 4(f) evaluation by itself must be circulated to the appropriate agencies for Section 4(f) coordination (23 CFR 771.135(i)). Section VII provides specific details on distribution and coordination of Section 4(f) evaluations. Section IX provides information on format and content of Section 4(f) evaluation.

If a programmatic Section 4(f) evaluation is used on the proposed project, this fact should be included and the Section 4(f) resource identified in the EA. The avoidance alternatives evaluation called for in Section 771.135(i) need not be repeated in the EA. Such evaluation would be part of

P-047-014

the documentation to support the applicability and findings of the programmatic document.

H. EA Revisions.

Following the public availability period, the EA should be revised or an attachment provided, as appropriate, to (1) reflect changes in the proposed action or mitigation measures resulting from comments received on the EA or at the public hearing (if one is held) and any impacts of the changes, (2) include any necessary findings, agreements, or determination (e.g., wetlands, Section 106, Section 4(f)) required for the proposal, and (3) include a copy of pertinent comments received on the EA and appropriate responses to the comments.

XXXIV. FINDING OF NO SIGNIFICANT IMPACT (FONSI)

The EA, revised or with attachment(s) (see paragraph above), is submitted by the HA to the FHWA along with (1) a copy of the public hearing transcript, when one is held, (2) a recommendation of the preferred alternative, and (3) a request that a finding of no significant impact be made. The basis for the HA's finding of no significant impact request should be adequately documented in the EA and any attachment(s).

After review of the EA and any other appropriate information, the FHWA may determine that the proposed action has no significant impacts. This is documented by attaching to the EA a separate statement (sample follows) which clearly sets forththe FHWA conclusions. If necessary, the FHWA may expand the sample FONSI to identify the basis for the decision, uses of land from Section 4(f) properties, wetland finding, etc.

The EA or FONSI should document compliance with NEPA and other applicable environmental laws, Executive Orders, and related requirements. If full compliance with these other requirements is not possible by the time the FONSI is prepared, the documents should reflect consultation with the appropriate agencies and describe when and how the requirements will be met. For example, any action requiring the use of Section 4(f) property cannot proceed until FHWA gives a Section 4(f) approval (49 U.S.C. 303(c)).

XXXV. DISTRIBUTION OF EAs AND FONSIs

A. Environmental Assessment

After clearance by FHWA, EAs must be made available for public inspection at the HA and FHWA Division offices (23 CFR 771.119(d)). Although only a notice of availability of the EA is required, the HA is encouraged to distribute a copy of the document with the notice to Federal, State, and local government agencies likely to have an interest in the undertaking and to the State intergovernmental review contacts. The HA should also distribute the EA to any Federal, State, or local agency known to have interest or special expertise (e.g., EPA for wetlands, water quality, air, noise, etc.) in those areas addressed in the EA which have or may have had potential for significant impact. The possible impacts and the agencies involved should be identified following the early coordination process. Where an individual permit would be required from the Corps of Engineers (COE) (i.e., Section 404 or Section 10) or from the Coast Guard (CG) (i.e., Section 9), a copy of the EA should be distributed to the involved agency in accordance with the U.S. Department of Transportation (DOT)/Corps of Engineers Memorandum of Agreement or the FHWA/U.S. Coast Guard Memorandum of Understanding, respectively. Any internal FHWA distribution will be determined by the Division Office on a case-by-case basis.

B. Finding of No Significant Impact

Formal distribution of a FONSI is not required. The HA must send a notice of availability of the FONSI to Federal, State, and local government agencies likely to have an interest in the undertaking and the State intergovernmental review contacts (23 CFR 771.121(b)). However, it is encouraged that agencies which commented on the EA (or requested to be informed) be advised of the project decision and the disposition of their comments and be provided a copy of the FONSI. This fosters good lines of communication and enhances interagency coordination.

P-047-014 LIE Environmental Impact Statement (EIS) -- FORMAT AND CONTENT

A. Cover Sheet

Each EIS should have a cover sheet containing the following information:

(EIS NUMBER)

Route, Termini, City or County, and State

Draft (Final) (Supplement)

Environmental Impact Statement

Submitted Pursuant to 42 U.S.C. 4332 (2) (c)(and where applicable, 49 U.S.C. 303) by the U.S. Department of Transportation, Federal Highway Administration and State Highway Agency and(As applicable, any other joint lead agency)

Cooperating Agencies (Include List Here, as applicable)

Date of Approval

For (State Highway Agency)

Date of Approval

For FHWA

The following persons may be contacted for additional information concerning this document:

(Name, address, and telephone number of FHWA Division Office contact)

(Name, address, and telephone number of HA contact)

A one-paragraph abstract of the statement.

Comments on this draft EIS are due by (date) and should be sent to (name and address).

The top left-hand corner of the cover sheet of all draft final and supplemental EISs contains an identification number. The following is an example:

FHWA-AZ-EIS-87-01-D(F)(S)

FHWA name of Federal agency

AZ name of State (cannot exceed four characters)

EIS environmental impact statement

87 year draft statement was prepared

01 sequential number of draft statement for each calendar year

D designates the statement as the draft statement

F designates the statement as the final statement

S designates supplemental statement and should be combined with draft (DS) or final (FS) statement designation. The year and sequential number will be the same as those used for the original draft EIS.

The EIS should be printed on 8 1/2 x 11-inch paper with any foldout sheets folded to that size. The

P-047-014

wider sheets should be 8 1/2 inches high and should open to the right with the title or identification on the right. The standard size is needed for administrative recordkeeping.

B. Summary

The summary should include:

1. A brief description of the proposed FHWA action indicating route, termini, type of improvement, number of lanes, length, county, city, State, and other information, as appropriate.
2. A description of any major actions proposed by other governmental agencies in the same geographic area as the proposed FHWA action.
3. A summary of all reasonable alternatives considered. (The draft EIS must identify the preferred alternative or alternatives officially identified by the HA (40 CFR 1502.14(e)). The final EIS must identify the preferred alternative and should discuss the basis for its selection (23 CFR 771.125(a)(1)).
4. A summary of major environmental impacts, both beneficial and adverse.
5. Any areas of controversy (including issues raised by agencies and the public).
6. Any major unresolved issues with other agencies.
7. A list of other Federal actions required for the proposed action (i.e., permit approvals, land transfer, Section 106 agreements, etc.).

C. Table of Contents

For consistency with CEQ regulations, the following standard format should be used:

1. Cover Sheet
2. Summary
3. Table of Contents
4. Purpose of and Need for Action
5. Alternatives
6. Affected Environment
7. Environmental Consequences
8. List of Preparers
9. List of Agencies, Organizations, and Persons to Whom Copies of the Statement are Sent
10. Comments and Coordination
11. Index
12. Appendices (if any)

D. Purpose of and Need for Action

Identify and describe the proposed action and the transportation problem(s) or other needs which it is intended to address (40 CFR 1502.13). This section should clearly demonstrate that a "need" exists and should define the "need" in terms understandable to the general public. This discussion

P-047-014

should clearly describe the problems which the proposed action is to correct. It will form the basis for the "no action" discussion in the "Alternatives" section, and assist with the identification of reasonable alternatives and the selection of the preferred alternative. Charts, tables, maps, and other illustrations (e.g., typical cross-section, photographs, etc.) are encouraged as useful presentation techniques.

The following is a list of items which may assist in the explanation of the need for the proposed action. It is by no means all-inclusive or applicable in every situation and is intended only as a guide.

1. Project Status - Briefly describe the project history including actions taken to date, other agencies and governmental units involved, action spending, schedules, etc.
2. System Linkage - Is the proposed project a "connecting link?" How does it fit in the transportation system?
3. Capacity - Is the capacity of the present facility inadequate for the present traffic? Projected traffic? What capacity is needed? What is the level(s) of service for existing and proposed facilities?
4. Transportation Demand - Including relationship to any statewide plan or adopted urban transportation plan together with an explanation of the project's traffic forecasts that are substantially different from those estimates from the 23 U.S.C. 134 (Section 134) planning process.
5. Legislation - Is there a Federal, State, or local governmental mandate for the action?
6. Social Demands or Economic Development - New employment, schools, land use plans, recreation, etc. What projected economic development/land use changes indicate the need to improve or add to the highway capacity?
7. Modal Interrelationships - How will the proposed facility interface with and serve to complement airports, rail and port facilities, mass transit services, etc.?
8. Safety - Is the proposed project necessary to correct an existing or potential safety hazard? Is the existing accident rate excessively high? Why? How will the proposed project improve it?
9. Roadway Deficiencies - Is the proposed project necessary to correct existing roadway deficiencies (e.g., substandard geometrics, load limits on structures, inadequate cross-section, or high maintenance costs)? How will the proposed project improve it?

E. Alternatives

This section of the draft EIS must discuss a range of alternatives, including all "reasonable alternatives" under consideration and those "other alternatives" which were eliminated from detailed study (23 CFR 771.123(c)). The section should begin with a concise discussion of how and why the "reasonable alternatives" were selected for detailed study and explain why "other alternatives" were eliminated. The following range of alternatives should be considered when determining reasonable alternatives:

1. "No-action" alternative: The "no-action" alternative normally includes short-term minor restoration types of activities (safety and maintenance improvements, etc.) that maintain continuing operation of the existing roadway.
2. Transportation System Management (TSM) alternative: The TSM alternative includes those activities which maximize the efficiency of the present system. Possible subject areas to include in this alternative are options such as fringe parking, ridesharing, high-occupancy vehicle (HOV) lanes on existing roadways, and traffic signal timing optimization. This limited construction alternative is usually relevant only for major projects proposed in urbanized

P-047-014

areas over 200,000 population.

For all major projects in these urbanized areas, HOV lanes should be considered. Consideration of this alternative may be accomplished by reference to the regional transportation plan, when that plan considers this option. Where a regional transportation plan does not reflect consideration of this option, it may be necessary to evaluate the feasibility of HOV lanes during early project development. Where a TSM alternative is identified as a reasonable alternative for a "connecting link" project, it should be evaluated to determine the effect that not building a highway link in the transportation plan will have on the remainder of the system. A similar analysis should be made where a TSM element(s) (e.g., HOV lanes) is part of a build alternative and reduces the scale of the highway link.

While the above discussion relates primarily to major projects in urbanized areas, the concept of achieving maximum utilization of existing facilities is equally important in rural areas. Before selecting an alternative on new location for major projects in rural areas, it is important to demonstrate that reconstruction and rehabilitation of the existing system will not adequately correct the identified deficiencies and meet the project need.

3. Mass Transit: This alternative includes those reasonable and feasible transit options (bus systems, rail, etc.) even though they may not be within the existing FHWA funding authority. It should be considered on all proposed major highway projects in urbanized areas over 200,000 population. Consideration of this alternative may be accomplished by reference to the regional or area transportation plan where that plan considers mass transit or by an independent analysis during early project development.

   Where urban projects are multi-modal and are proposed for Federal funding, close coordination is necessary with the Urban Mass Transportation Administration (UMTA). In these situations, UMTA should be consulted early in the project-development process. Where UMTA funds are likely to be requested for portions of the proposal, UMTA must be requested to be either a joint lead agency or a cooperating agency at the earliest stages of project development (23 CFR 771.111(d)). Where applicable, cost-effectiveness studies that have been performed should be summarized in the EIS.

4. Build alternatives: Both improvement of existing highway(s) and alternatives on new location should be evaluated. A representative number of reasonable alternatives must be presented and evaluated in detail in the draft EIS (40 CFR 1502.14(a)). For most major projects, there is a potential for a large number of reasonable alternatives. Where there is a large number of alternatives, only a representative number of the most reasonable examples, covering the full range ofalternatives, must be presented. The determination of the number of reasonable alternatives in the draft EIS, therefore, depends on the particular project and the facts and circumstances in each case.

   Each alternative should be briefly described using maps or other visual aids such as photographs, drawings, or sketches to help explain the various alternatives. The material should provide a clear understanding of each alternative's termini, location, costs, and the project concept (number of lanes, right-of-way requirements, median width, access control, etc.). Where land has been or will be reserved or dedicated by local government(s), donated by individuals, or acquired through advanced or hardship acquisition for use as highway right-of-way for any alternative under consideration, the draft EIS should identify the status and extent of such property and the alternatives involved. Where such lands are reserved, the EIS should state that the reserved lands will not influence the alternative to be selected.

   Development of more detailed design for some aspects (e.g., Section 4(f), COE or CG permits, noise, wetlands, etc.) of one or more alternatives may be necessary during preparation of the draft and final EIS in order to evaluate impacts or mitigation measures or to address issues raised by other agencies or the public. However, care should be taken to avoid unnecessarily specifying features which preclude cost-effective final design options.

   All reasonable alternatives under consideration (including the no-build) need to be developed

P-047-014

to a comparable level of detail in the draft EIS so that their comparative merits may be evaluated (40 CFR 1502.14(b) and (d)). In those situations where the HA has officially identified a "preferred" alternative based on its early coordination and environmental studies, the HA should so indicate in the draft EIS. In these instances, the draft EIS should include a statement indicating that the final selection of an alternative will not be made until the alternatives' impacts and comments on the draft EIS and from the public hearing (if held) have been fully evaluated. Where a preferred alternative has not been identified, the draft EIS should state that all reasonable alternatives are underconsideration and that a decision will be made after the alternatives' impacts and comments on the draft EIS and from the public hearing (if held) have been fully evaluated.

The final EIS must identify the preferred alternative and should discuss the basis for its selection (23 CFR 771.125(a)(1)). The discussion should provide the information and rationale identified in Section VIII (Record of Decision), paragraph (B). If the preferred alternative is modified after the draft EIS, the final EIS should clearly identify the changes and discuss the reasons why any new impacts are not significant.

F. Affected Environment

This section provides a concise description of the existing social, economic, and environmental setting for the area affected by all alternatives presented in the EIS. Where possible, the description should be a single description for the general project area rather than a separate one for each alternative. The general population served and/or affected (city, county, etc.) by the proposed action should be identified by race, color, national origin, and age. Demographic data should be obtained from available secondary sources (e.g., census data, planning reports) unless more detailed information is necessary to address specific concerns. All socially, economically, and environmentally sensitive locations or features in the proposed project impact area (e.g., neighborhoods, elderly/minority/ ethnic groups, parks, hazardous material sites, historic resources, wetlands, etc.), should be identified on exhibits and briefly described in the text. However, it may be desirable to exclude from environmental documents the specific location of archeological sites to prevent vandalism.

To reduce paperwork and eliminate extraneous background material, the discussion should be limited to data, information, issues, and values which will have a bearing on possible impacts, mitigation measures, and on the selection of an alternative. Data and analyses should be commensurate with the importance of the impact, with the less important material summarized or referenced rather than be reproduced. Photographs, illustrations, and other graphics should be used with the text to give a clear understanding of the area and the important issues. Other Federal activities which contribute to the significance of the proposed action's impacts should be described.

This section should also briefly describe the scope and status of the planning processes for the local jurisdictions and the project area. Maps of any adopted land use and transportation plans for these jurisdictions and the project area would be helpful in relating the proposed project to the planning processes.

G. Environmental Consequences

This section includes the probable beneficial and adverse social, economic, and environmental effects of alternatives under consideration and describes the measures proposed to mitigate adverse impacts. The information should have sufficient scientific and analytical substance to provide a basis for evaluating the comparative merits of the alternatives. The discussion of the proposed project impacts should not use the term significant in describing the level of impacts. There is no benefit to be gained from its use. If the term significant is used, however, it should be consistent with the CEQ definition and be supported by factual information.

There are two principal ways of preparing this section. One is to discuss the impacts and mitigation measures separately for each alternative with the alternatives as headings. The second (which is advantageous where there are few alternatives or where impacts are similar for the various alternatives) is to present this section with the impacts as the headings. Where appropriate, a

P-047-014

sub-section should be included which discusses the general impacts and mitigation measures that are the same for the various alternatives under consideration. This would reduce or eliminate repetition under each of the alternative discussions. Charts, tables, maps, and other graphics illustrating comparisons between the alternatives (e.g., costs, residential displacements, noise impacts, etc.) are useful as a presentation technique.

When preparing the final EIS, the impacts and mitigation measures of the alternatives, particularly the preferred alternative, may need to be discussed in more detail to elaborate on information, firm-up commitments, or address issues raised following the draft EIS. The final EIS should also identify anynew impacts (and their significance) resulting from modification of or identification of substantive new circumstances or information regarding the preferred alternative following the draft EIS circulation. Note: Where new significant impacts are identified a supplemental draft EIS is required (40 CFR 1502.9(c)).

The following information should be included in both the draft and final EIS for each reasonable alternative:

1. A summary of studies undertaken, any major assumptions made and supporting information on the validity of the methodology (where the methodology is not generally accepted as state-of-the-art).

2. Sufficient supporting information or results of analyses to establish the reasonableness of the conclusions on impacts.

3. A discussion of mitigation measures. These measures normally should be investigated in appropriate detail for each reasonable alternative so they can be identified in the draft EIS. The final EIS should identify, describe and analyze all proposed mitigation measures for the preferred alternative.

In addition to normal FHWA program monitoring of design and construction activities, special instances may arise when a formal program for monitoring impacts or implementation of mitigation measures will be appropriate. For example, monitoring ground or surface waters that are sources for drinking water supply; monitoring noise or vibration of nearby sensitive activities (e.g., hospitals, schools); or providing on-site professional archeologist to monitor excavation activities in highly sensitive archeological areas. In these instances, the final EIS should describe the monitoring program.

1. A discussion, evaluation and resolution of important issues on each alternative. If important issues raised by other agencies on the preferred alternative remain unresolved,the final EIS must identify those issues and the consultations and other efforts made to resolve them (23 CFR 771.125(a)(2)).

   Listed below are potentially significant impacts most commonly encountered by highway projects. These factors should be discussed for each reasonable alternative where a potential for impact exists. This list is not all-inclusive and on specific projects there may be other impact areas that should be included.

2. Land Use Impacts

   This discussion should identify the current development trends and the State and/or local government plans and policies on land use and growth in the area which will be impacted by the proposed project.

   These plans and policies are normally reflected in the area's comprehensive development plan, and include land use, transportation, public facilities, housing, community services, and other areas.

   The land use discussion should assess the consistency of the alternatives with the comprehensive development plans adopted for the area and (if applicable) other plans used

P-047-014

in the development of the transportation plan required by Section 134. The secondary social, economic, and environmental impacts of any substantial, foreseeable, induced development should be presented for each alternative, including adverse effects on existing communities. Where possible, the distinction between planned and unplanned growth should be identified.

3. Farmland Impacts

Farmland includes 1) prime, 2) unique, 3) other than prime or unique that is of statewide importance, and 4) other than prime or unique that is of local importance.

The draft EIS should summarize the results of early consultation with the Soil Conservation Service (SCS) and, as appropriate, State and local agriculture agencies where any of the four specified types of farmland could be directly orindirectly impacted by any alternative under consideration. Where farmland would be impacted, the draft EIS should contain a map showing the location of all farmlands in the project impact area, discuss the impacts of the various alternatives and identify measures to avoid or reduce the impacts. Form AD 1006 (Farmland Conversion Impact Rating) should be processed, as appropriate, and a copy included in the draft EIS. Where the Land Evaluation and Site Assessment score (from Form AD 1006) is 160 points or greater, the draft EIS should discuss alternatives to avoid farmland impacts.

If avoidance is not possible, measures to minimize or reduce the impacts should be evaluated and, where appropriate, included in the proposed action.

4. Social Impacts

Where there are foreseeable impacts, the draft EIS should discuss the following items for each alternative commensurate with the level of impacts and to the extent they are distinguishable:

(a) Changes in the neighborhoods or community cohesion for the various social groups as a result of the proposed action. These changes may be beneficial or adverse, and may include splitting neighborhoods, isolating a portion of a neighborhood or an ethnic group, generating new development, changing property values, or separating residents from community facilities, etc.

(b) Changes in travel patterns and accessibility (e.g., vehicular, commuter, bicycle, or pedestrian).

(c) Impacts on school districts, recreation areas, churches, businesses, police and fire protection, etc. This should include both the direct impacts to these entities and the indirect impacts resulting from the displacement of households and businesses.

(d) Impacts of alternatives on highway and traffic safety as well as on overall public safety.

(e) General social groups specially benefitted or harmed by the proposed project. The effects of a project on the elderly, handicapped, nondrivers, transit-dependent, and minority and ethnic groups are of particular concern and should be described to the extent these effects can be reasonably predicted. Where impacts on a minority or ethnic population are likely to be an important issue, the EIS should contain the following information broken down by race, color, and national origin: the population of the study area, the number of displaced residents, the type and number of displaced businesses, and an estimate of the number of displaced employees in each business sector. Changes in ethnic or minority employment opportunities should be discussed and the relationship of the project to other Federal actions which may serve or adversely affect the ethnic or minority population should be identified.

The discussion should address whether any social group is disproportionally impacted

P-047-014

and identify possible mitigation measures to avoid or minimize any adverse impacts. Secondary sources of information such as census and personal contact with community leaders supplemented by visual inspections normally should be used to obtain the data for this analysis. However, for projects with major community impacts, a survey of the affected area may be needed to identify the extent and severity of impacts on these social groups.

5. Relocation Impacts

The relocation information should be summarized in sufficient detail to adequately explain the relocation situation including anticipated problems and proposed solutions. Project relocation documents from which information is summarized shouldbe referenced in the draft EIS. Secondary sources of information such as census, economic reports, and contact with community leaders, supplemented by visual inspections (and, as appropriate, contact with local officials) may be used to obtain the data for this analysis. Where a proposed project will result in displacements, the following information regarding households and businesses should be discussed for each alternative under consideration commensurate with the level of impacts and to the extent they are likely to occur:

(a) An estimate of the number of households to be displaced, including the family characteristics (e.g., minority, ethnic, handicapped, elderly, large family, income level, and owner/tenant status). However, where there are very few displacees, information on race, ethnicity and income levels should not be included in the EIS to protect the privacy of those affected.

(b) A discussion comparing available (decent, safe, and sanitary) housing in the area with the housing needs of the displacees. The comparison should include (1) price ranges, (2) sizes (number of bedrooms), and (3) occupancy status (owner/tenant).

(c) A discussion of any affected neighborhoods, public facilities, non-profit organizations, and families having special composition (e.g., ethnic, minority, elderly, handicapped, or other factors) which may require special relocation considerations and the measures proposed to resolve these relocation concerns.

(d) A discussion of the measures to be taken where the existing housing inventory is insufficient, does not meet relocation standards, or is not within the financial capability of the displacees. A commitment to last resort housing should be includedwhen sufficient comparable replacement housing may not be available.

(e) An estimate of the numbers, descriptions, types of occupancy (owner/tenant), and sizes (number of employees) of businesses and farms to be displaced. Additionally, the discussion should identify (1) sites available in the area to which the affected businesses may relocate, (2) likelihood of such relocation, and (3) potential impacts on individual businesses and farms caused by displacement or proximity of the proposed highway if not displaced.

(f) A discussion of the results of contacts, if any, with local governments, organizations, groups, and individuals regarding residential and business relocation impacts, including any measures or coordination needed to reduce general and/or specific impacts. These contacts are encouraged for projects with large numbers of relocatees or complex relocation requirements. Specific financial and incentive programs or opportunities (beyond those provided by the Uniform Relocation Act) to residential and business relocatees to minimize impacts may be identified, if available through other agencies or organizations.

(g) A statement that (1) the acquisition and relocation program will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and (2) relocation resources are available to all residential and business relocatees without discrimination.

P-047-014

6. Economic Impacts

Where there are foreseeable economic impacts, the draft EIS should discuss the following for each alternative commensurate with the level of impacts:

(a) The economic impacts on the regional and/or local economy such as the effects of the project on development, tax revenues and public expenditures, employment opportunities, accessibility, and retail sales. Where substantial impacts on the economic viability of affected municipalities are likely to occur, they should also be discussed together with a summary of any efforts undertaken and agreements reached for using the transportation investment to support both public and private economic development plans. To the extent possible, this discussion should rely upon results of coordination with and views of affected State, county, and city officials and upon studies performed under Section 134.

(b) The impacts on the economic vitality of existing highway-related businesses (e.g., gasoline stations, motels, etc.) and the resultant impact, if any, on the local economy. For example, the loss of business or employment resulting from building an alternative on new location bypassing a local community.

(c) Impacts of the proposed action on established business districts, and any opportunities to minimize or reduce such impacts by the public and/or private sectors. This concern is likely to occur on a project that might lead to or support new large commercial development outside of a central business district.

7. Joint Development

Where appropriate, the draft EIS should identify and discuss those joint development measures which will preserve or enhance an affected community's social, economic, environmental, and visual values. This discussion may be presented separately or combined with the land use and/or social impacts presentations. The benefits to be derived, those who will benefit (communities, social groups, etc.), and the entities responsible for maintaining the measures should be identified.

8. Considerations Relating to Pedestrians and Bicyclists

Where current pedestrian or bicycle facilities or indications of use are identified, the draft EIS should discuss the current and anticipated use of the facilities, the potential impacts of the affected alternatives, and proposed measures, if any, to avoid or reduce adverse impacts to the facility(ies) and its users. Where new facilities are proposed as a part of the proposed highway project, the EIS should include sufficient information to explain the basis for providing the facilities (e.g., proposed bicycle facility is a link in the local plan or sidewalks will reduce project access impact to the community). The final EIS should identify those facilities to be included in the preferred alternative. Where the preferred alternative would sever an existing major route for non-motorized transportation traffic, the proposed project needs to provide a reasonably alternative route or demonstrate that such a route exists (23 U.S.C. 109(n)). To the fullest extent possible, this needs to be described in the final EIS.

8. Air Quality Impacts

The draft EIS should contain a brief discussion of the transportation-related air quality concerns in the project area and a summary of the project- related carbon monoxide (CO) analysis if such analysis is performed. The following information should be presented, as appropriate.

(a) Mesoscale Concerns: Ozone (O_3), Hydrocarbons (HC), and Nitrogen Oxide (NO_X) air quality concerns are regional in nature and as such meaningful evaluation on a project-by-project basis is not possible. Where these pollutants are an issue, the air quality emissions inventories in the State Implementation Plan (SIP) should be

P-047-014

referenced and briefly summarized in the draft EIS. Further, the relationship of the project to the SIP should be described in the draft EIS by including one of the following statements:

1 This project is in an area where the SIP does not contain any transportation control measures. Therefore, the conformity procedures of 23 CFR 770 do not apply to this project.

2 This project is in an area which has transportation control measures in the SIP which was (conditionally) approved by the Environmental Protection Agency (EPA) on (date). The FHWA has determined that both the transportation plan and the transportation improvement program conform to the SIP. The FHWA has determined that this project is included in the transportation improvement program for the (indicate 3C planning area). Therefore, pursuant to 23 CFR 770, this project conforms to the SIP.

Under certain circumstances, neither of these statements will precisely fit the situation and may need to be modified. Additionally, if the project is a Transportation Control Measure from the SIP, this should be highlighted to emphasize the project's air quality benefits.

(b) Microscale Concerns: Carbon monoxide is a project- related concern and as such should be evaluated in the draft EIS. A microscale CO analysis is unnecessary where such impacts (project CO contribution plus background) can be judged to be well below the 1- and 8-hour National Ambient AirQuality Standards (or other applicable State or local standards). This judgment may be based on (1) previous analyses for similar projects; (2) previous general analyses for various classes of projects; or (3) simplified graphical or "look-up" table evaluations. In these cases, a brief statement stating the basis for the judgment is sufficient.

For those projects where a microscale CO analysis is performed, each reasonable alternative should be analyzed for the estimated time of completion and design year. A brief summary of the methodologies and assumptions used should be included in the draft EIS. Lengthy discussions, if needed, should be included in a separate technical report and referenced in the EIS. Total CO concentrations (project contribution plus estimated background) at identified reasonable receptors for each alternative should be reported. A comparison should be made between alternatives and with applicable State and national standards. Use of a table for this comparison is recommended for clarity.

As long as the total predicted 1-hour CO concentration is less than 9 ppm (the 8-hour CO standard), no separate 8-hour analysis is necessary. If the 1-hour CO concentration is greater than 9 ppm, an 8-hour analysis should be performed. Where the preferred alternative would result in violations of the 1 or 8-hour CO standards, an effort should be made to develop reasonable mitigation measures through early coordination between FHWA, EPA, and appropriate State and local highway and air quality agencies. The final EIS should discuss the proposed mitigation measures and include evidence of the coordination.

9. Noise Impacts

The draft EIS should contain a summary of the noise analysis including the following for each alternative under detailed study:

(a) A brief description of noise sensitive areas (residences, businesses, schools,parks, etc.), including information on the number and types of activities which may be affected. This should include developed lands and undeveloped lands for which development is planned, designed, and programmed.

P-047-014

(b) The extent of the impact (in decibels) at each sensitive area. This includes a comparison of the predicted noise levels with both the FHWA noise abatement criteria and the existing noise levels. (Traffic noise impacts occur when the predicted traffic noise levels approach or exceed the noise abatement criteria or when they substantially exceed the existing noise levels). Where there is a substantial increase in noise levels, the HA should identify the criterion used for defining "substantial increase." Use of a table for this comparison is recommended for clarity.

(c) Noise abatement measures which have been considered for each impacted area and those measures that are reasonable and feasible and that would "likely" be incorporated into the proposed project. Estimated costs, decibel reductions and height and length of barriers should be shown for all abatement measures.

Where it is desirable to qualify the term "likely," the following statement or similar wording would be appropriate. "Based on the studies completed to date, the State intends to install noise abatement measures in the form of a barrier at (location(s)). These preliminary indications of likely abatement measures are based upon preliminary design for a barrier of _____ high and _____ long and a cost of $_____ that will reduce the noise level by _____ dBA for _____ residences (businesses, schools, parks, etc.). (Where there is more than one barrier, provide information for each one.) If during final design these conditions substantially change, the abatement measures might not be provided. A final decision onthe installation of abatement measure(s) will be made upon completion of the project design and the public involvement process."

(d) Noise impacts for which no prudent solution is reasonably available and the reasons why.

10. Water Quality Impacts

The draft EIS should include summaries of analyses and consultations with the State and/or local agency responsible for water quality. Coordination with the EPA under the Federal Clean Water Act may also provide assistance in this area. The discussion should include sufficient information to describe the ambient conditions of streams and water bodies which are likely to be impacted and identify the potential impacts of each alternative and proposed mitigation measures. Under normal circumstances, existing data may be used to describe ambient conditions. The inclusion of water quality data spanning several years is encouraged to reflect trends.

The draft EIS should also identify any locations where roadway runoff or other nonpoint source pollution may have an adverse impact on sensitive water resources such as water supply reservoirs, ground water recharge areas, and high quality streams. The 1981 FHWA research report entitled "Constituents of Highway Runoff," the 1985 report entitled "Management Practices for Mitigation of Highway Stormwater Runoff Pollution," and the 1987 report entitled "Effects of Highway Runoff on Receiving Waters" contain procedures for estimating pollutant loading from highway runoff and would be helpful in determining the level of potential impacts and appropriate mitigative measures. The draft EIS should identify the potential impacts of each alternative and proposed mitigation measures.

Where an area designated as principal or sole-source aquifer under Section 1424(e) of the Safe Drinking Water Act may be impacted by a proposed project, early coordination with EPA will assist in identifying potential impacts. The EPA will furnish information on whether any of the alternatives affect the aquifer. This coordination should also identify any potential impacts to the critical aquifer protection area (CAPA), if designated, within affected sole-source aquifers. If none of thealternatives affect the aquifer, the requirements of the Safe Drinking Water Act are satisfied. If an alternative is selected which affects the aquifer, a design must be developed to assure, to the satisfaction of EPA, that it will not contaminate the aquifer (40 CFR 149). The draft EIS should document coordination with EPA and identify its position on the impacts of the various alternatives. The final EIS should show that EPA's

P-047-014

concerns on the preferred alternative have been resolved.

Wellhead protection areas were authorized by the 1986 Amendments to the Safe Drinking Water Act. Each State will develop State wellhead protection plans with final approval by EPA. When a proposed project encroaches on a wellhead protection area, the draft EIS should identify the area, the potential impact of each alternative and proposed mitigation measures. Coordination with the State agency responsible for the protection plan will aid in identifying the areas, impacts and mitigation. If the preferred alternative impacts these areas, the final EIS should document that it complies with the approved State wellhead protection plan.

11. Permits

If a facility such as a safety rest area is proposed and it will have a point source discharge, a Section 402 permit will be required for point source discharge (40 CFR 122). The draft EIS should discuss potential adverse impacts resulting from such proposed facilities and identify proposed mitigation measures. The need for a Section 402 permit and Section 401 water quality certification should be identified in the draft EIS.

For proposed actions requiring a Section 404 or Section 10 (Corps of Engineers) permit, the draft EIS should identify by alternative the general location of each dredge or fill activity, discuss the potential adverse impacts, identify proposed mitigation measures (if not addressed elsewhere in the draft EIS), and include evidence of coordination with the Corps of Engineers (in accordance with the U.S. DOT/Corps of Engineers Memorandum of Agreement) and appropriate Federal, State and local resource agencies, and State and local water quality agencies. Where the preferred alternative requires an individual Section 404 or Section 10 permit, the final EIS should identify for eachpermit activity the approximate quantities of dredge or fill material, general construction grades and proposed mitigation measures.

For proposed actions requiring Section 9 (U.S. Coast Guard bridge) permits, the draft EIS should identify by alternative the location of the permit activity, potential impacts to navigation and the environment (if not addressed elsewhere in the document), proposed mitigation measures and evidence coordination with the U.S. Coast Guard (in accordance with the FHWA/U.S. Coast Guard Memorandum of Understanding). Where the preferred alternative requires a Section 9 permit, the final EIS should identify for each permit activity the proposed horizontal and vertical navigational clearances and include an exhibit showing the various dimensions.

For all permit activities the final EIS should include evidence that every reasonable effort has been made to resolve the issues raised by other agencies regarding the permit activities. If important issues remain unresolved, the final EIS must identify those issues, the positions of the respective agencies on the issues and the consultations and other efforts made to resolve them (23 CFR 771.125(a)).

12. Wetland Impacts

When an alternative will impact wetlands the draft EIS should (1) identify the type, quality, and function of wetlands involved, (2) describe the impacts to the wetlands, (3) evaluate alternatives which would avoid these wetlands, and (4) identify practicable measures to minimize harm to the wetlands. Wetlands should be identified by using the definition of 33 CFR 328.3(b) (issued on November 13, 1986) which requires the presence of hydrophytic vegetation, hydric soils and wetland hydrology. Exhibits showing wetlands in the project impact area in relation to the alternatives, should be provided.

In evaluating the impact of the proposed project on wetlands, the following two items should be addressed: (1) the importance of the impacted wetland(s) and (2) the severity of this impact. Merely listing the number of acres taken by the various alternatives of a highway proposal does not provide sufficient information upon which to determine the degree

P-047-014

ofimpact on the wetland ecosystem. The wetlands analysis should be sufficiently detailed to provide an understanding of these two elements.

In evaluating the importance of the wetlands, the analysis should consider such factors as: (1) the primary functions of the wetlands (e.g., flood control, wildlife habitat, ground water recharge, etc.), (2) the relative importance of these functions to the total wetland resource of the area, and (3) other factors such as uniqueness that may contribute to the wetlands importance.

In determining the wetland impact, the analysis should show the project's effects on the stability and quality of the wetland(s). This analysis should consider the short- and long-term effects on the wetlands and the importance of any loss such as: (1) flood control capacity, (2) shore line anchorage potential, (3) water pollution abatement capacity, and (4) fish and wildlife habitat value. The methodology developed by FHWA and described in reports numbered FHWA-IP-82-23 and FHWA IP-82-24, "A Method for Wetland Functional Assessment Volumes I and II," is recommended for use in conducting this analysis. Knowing the importance of the wetlands involved and the degree of the impact, the HA and FHWA will be in a better position to determine the mitigation efforts necessary to minimize harm to these wetlands. Mitigation measures which should be considered include preservation and improvement of existing wetlands and creation of new wetlands (consistent with 23 CFR 777).

If the preferred alternative is located in wetlands, to the fullest extent possible, the final EIS needs to contain the finding required by Executive Order 11990 that there are no practicable alternatives to construction in wetlands. Where the finding is included, approval of the final EIS will document compliance with the Executive Order 11990 requirements (23 CFR 771.125(a)(1)). The finding should be included in a separate subsection entitled "Only Practicable Alternative Finding" and should be supported by the following information:

(a) a reference to Executive Order 11990;

(b) an explanation why there are no practicable alternatives to the proposed action;

(c) an explanation why the proposed action includes all practicable measures to minimize harm to wetlands; and

(d) a concluding statement that: "Based upon the above considerations, it is determined that there is no practicable alternative to the proposed construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use."

13. Water Body Modification and Wildlife Impacts

For each alternative under detailed study the draft EIS should contain exhibits and discussions identifying the location and extent of water body modifications (e.g., impoundment, relocation, channel deepening, filling, etc.). The use of the stream or body of water for recreation, water supply, or other purposes should be identified. Impacts to fish and wildlife resulting from the loss degradation, or modification of aquatic or terrestrial habitat should also be discussed. The results of coordination with appropriate Federal, State and local agencies should be documented in the draft EIS. For example, coordination with FWS under the Fish and Wildlife Coordination Act of 1958.

14. Floodplain Impacts

National Flood Insurance Program (NFIP) maps or, if NFIP maps are not available, information developed by the highway agency should be used to determine whether an alternative will encroach on the base (100-year) floodplain. The location hydraulic studies required by 23 CFR 650, Subpart A, must include a discussion of the following items commensurate with the level of risk or environmental impact, for each alternative which

P-047-014

encroaches on base floodplains or would support base floodplain development:

(a) The flooding risks;

(b) The impacts on natural and beneficial floodplain values;

(c) The support of probable incompatible floodplain development (i.e., any development that is not consistent with a community's floodplain development plan);

(d) The measures to minimize floodplain impacts; and

(e) The measures to restore and preserve the natural and beneficial floodplain values.

The draft EIS should briefly summarize the results of the location hydraulic studies. The summary should identify the number of encroachments and any support of incompatible floodplain developments and their potential impacts. Where an encroachment or support of incompatible floodplain development results in substantial impacts, the draft EIS should provide more detailed information on the location, impacts and appropriate mitigation measures. In addition, if any alternative (I) results in a floodplain encroachment or supports incompatible floodplain development having significant impacts, or (2) requires a commitment to a particular structure size or type, the draft EIS needs to include an evaluation and discussion of practicable alternatives to the structure or to the significant encroachment. The draft EIS should include exhibits which display the alternatives, the base floodplains and, where applicable, the regulatory floodways.

If the preferred alternative includes a floodplain encroachment having significant impacts, the final EIS must include a finding that it is the only practicable alternative as required by 23 CFR 650, Subpart A. The finding should refer to Executive Order 11988 and 23 CFR 650, Subpart A. It should be included in a separate subsection entitled "Only Practicable Alternative Finding" and must be supported by the following information.

(a) The reasons why the proposed action must be located in the floodplain;

(b) The alternatives considered and why they were not practicable; and

(c) A statement indicating whether the action conforms to applicable State or local floodplain protection standards.

For each alternative encroaching on a designated or proposed regulatory floodway, the draft EIS should provide a preliminary indication of whether the encroachment would be consistent with or require a revision to the regulatory floodway. Engineering and environmental analyses should be undertaken, commensurate with the level of encroachment, to permit the consistency evaluation and identify impacts. Coordination with the Federal Emergency Management Agency (FEMA) and appropriate State and local government agencies should be undertaken for each floodway encroachment. If the preferred alternative encroaches on a regulatory floodway, the final EIS should discuss the consistency of the action with the regulatory floodway. If a floodway revision is necessary, the EIS should include evidence from FEMA and local or State agency indicating that such revision would be acceptable.

15. Wild and Scenic Rivers

If the proposed action could have foreseeable adverse effects on a river on the National Wild and Scenic Rivers System or a river under study for designation to the National Wild and Scenic Rivers System, the draft EIS should identify early coordination undertaken with the agency responsible for managing the listed or study river (i.e., National Park Service (NPS), Fish and Wildlife Service (FWS), Bureau of Land Management (BLM), or Forest Service (FS)). For each alternative under consideration, the EIS should identify the potential adverse

P-047-014

effects on the natural, cultural, and recreational values of the listed or study river. Adverse effects include alteration of the free-flowing nature of the river, alteration of the setting or deterioration of water quality. If it is determined that any of the alternatives could foreclose options to designate a study river under the Act, or adversely affect those qualities of a listed river for which it was designated, to the fullest extent possible, the draft EIS needs to reflect consultation with the managing agency on avoiding or mitigating the impacts (23 CFR 771.123(c)). The final EIS should identify measures that will be included in the preferred alternative to avoid or mitigate such impacts.

Publicly owned waters of designated wild and scenic rivers are protected by Section 4(f). Additionally, public lands adjacent to a Wild and Scenic River may be subject to Section 4(f) protection. An examination of any adopted or proposed management plan for a listed river should be helpful in making the determination on applicability of Section 4(f). For each alternative that takes such land, coordination with the agency responsible for managing the river (either NPS, FWS, BLM, or FS) will provide information on the management plan, specific affected land uses, and any necessary Section 4(f) coordination.

16. Coastal Barriers

The Coastal Barrier Resources Act (CBRA) establishes certain coastal areas to be protected by prohibiting the expenditure of Federal funds for new and expanded facilities within designated coastal barrier units. When a proposed project impacts a coastal barrier unit, the draft EIS should: include a map showing the relationship of each alternative to the unit(s); identify direct and indirect impacts to the unit(s), quantifying and describing the impacts as appropriate; discuss the results of early coordination with FWS, identifying any issues raised and how they were addressed, and; identify any alternative which (if selected) would require an exception under the Act. Any issues identified or exceptions required for the preferred alternative should be resolved prior to its selection. This resolution should be documented in the final EIS.

17. Coastal Zone Impacts

Where the proposed action is within, or is likely to affect land or water uses within the area covered by a State Coastal Zone Management Program (CZMP) approved by the Department of Commerce, the draft EIS should briefly describe the portion of the affected CZMP plan, identify the potential impacts, and include evidence of coordination with the State Coastal Zone Management agency or appropriate local agency. The final EIS should include the State Coastal Zone Management agency's determination on consistency with the State CZMP plan. (In some States, an agency will make a consistency determination only after the final EIS is approved, but will provide a preliminary indication before the final EIS that the project is "not inconsistent" or "appears to be consistent" with the plan.) (Fordirect Federal actions, the final EIS should include the lead agency's consistency determination and agreement by the State CZM agency.) If the preferred alternative is inconsistent with the State's approved CZMP, it can be Federally funded only if the Secretary of Commerce makes a finding that the proposed action is consistent with the purpose or objectives of the CZM Act or is necessary in the interest of national security. To the fullest extent possible, such a finding needs to be included in the final EIS. If the finding is denied, the action is not eligible for Federal funding unless modified in such a manner to remove the inconsistency finding. The final EIS should document such results.

18. Threatened or Endangered Species

The HA must obtain information from the FWS of the DOI and/or the National Marine Fisheries Service (NMFS) of the Department of Commerce to determine the presence or absence of listed and proposed threatened or endangered species and designated and proposed critical habitat in the proposed project area (50 CFR 402.12(c)). The information may be (1) a published geographical list of such species or critical habitat; (2) a project-specific notification of a list of such species or critical habitat; or (3) substantiated information from other credible sources. Where the information is obtained from a published

P-047-014

geographical list the reasons why this would satisfy the coordination with DOI should be explained. If there are no species or critical habitat in the proposed project area, the Endangered Species Act requirements have been met. The results of this coordination should be included in the draft EIS.

When a proposed species or a proposed critical habitat may be present in the proposed project area, an evaluation or, if appropriate, a biological assessment is made on the potential impacts to identify whether any such species or critical habitat are likely to be adversely affected by the project. Informal consultation with FWS and/or NMFS should be undertaken during the evaluation. The draft EIS should include exhibits showing the location of the species or habitat, summarize the evaluation and potential impacts, identify proposed mitigation measures, and evidence coordination with FWS and/or NMFS. If the project is likely to jeopardize the continued existence of any proposed species or result in the destruction oradverse modification of proposed critical habitat, the HA in consultation with the FHWA must confer with FWS and/or NMFS to attempt to resolve potential conflicts by avoiding, minimizing, or reducing the project impacts (50 CFR 402.10(a)). If the preferred alternative is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat, a conference with FWS and/or NMFS must be held to assist in identifying and resolving potential conflicts. To the fullest extent possible, the final EIS needs to summarize the results of the conference and identify reasonable and prudent alternatives to avoid the jeopardy to such proposed species or critical habitat. If no alternatives exist, the final EIS should explain the reasons why and identify any proposed mitigation measures to minimize adverse effects.

When a listed species or a designated critical habitat may be present in the proposed project area, a biological assessment must be prepared to identify any such species or habitat which are likely to be adversely affected by the proposed project (50 CFR 402.12). Informal consultation should be undertaken or, if desirable, a conference held with FWS and/or NMFS during preparation of the biological assessment. The draft EIS should summarize the following data from the biological assessment:

(a) The species distribution, habitat needs, and other biological requirements;

(b) The affected areas of the proposed project;

(c) Possible impacts to the species including opinions of recognized experts on the species at issue;

(d) Measures to avoid or minimize adverse impacts; and

(e) Results of consultation with FWS and/or NMFS.

In selecting an alternative, jeopardy to a listed species or the destruction or adverse modification ofdesignated critical habitat must be avoided (50 CFR 402.01(a)). If the biological assessment indicates that there are no listed species or critical habitat present that are likely to be adversely affected by the preferred alternative, the final EIS should evidence concurrence by the FWS and/or NMFS in such a determination and identify any proposed mitigation for the preferred alternative.

If the results of the biological assessment or consultation with FWS and/or NMFS show that the preferred alternative is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat, to the fullest extent possible, the final EIS needs to contain: (l) a summary of the biological assessment (see data above for draft EIS); (2) a summary of the steps taken, including alternatives or measures evaluated and conferences and consultations held, to resolve the project's conflicts with the listed species or critical habitat; (3) a copy of the biological opinion; (4) a request for an exemption from the Endangered Species Act; (5) the results of the exemption request; and (6) a statement that (if the exemption is denied) the action is not eligible for Federal funding.

19. Historic and Archeological Preservation

P-047-014

The draft EIS should contain a discussion demonstrating that historic and archeological resources have been identified and evaluated in accordance with the requirements of 36 CFR 800.4 for each alternative under consideration. The information and level of effort needed to identify and evaluate historic and archeological resources will vary from project to project as determined by the FHWA after considering existing information, the views of the SHPO and the Secretary of Interior's "Standards and Guidelines for Archeology and Historic Preservation." The information for newly identified historic resources should be sufficient to determine their significance and eligibility for the National Register of Historic Places. The information for archeological resources should be sufficient to identify whether each warrants preservation in place or whether it is important chiefly because of what can be learned by data recovery and has minimal value for preservation in place. Where archeological resources are not a major factor in the selection of a preferred alternative, the determination ofeligibility for the National Register of newly identified archeological resources may be deferred until after circulation of the draft EIS.

The draft EIS discussion should briefly summarize the methodologies used in identifying historic and archeological resources. Because Section 4(f) of the DOT Act applies to the use of historic resources on or eligible for the National Register and to archeological resources on or eligible for the National Register and which warrant preservation in place, the draft EIS should describe the historical resources listed in or eligible for the National Register and identify any archeological resources that warrant preservation in place. The draft EIS should summarize the impacts of each alternative on and proposed mitigation measures for each resource. The document should evidence coordination with the SHPO on the significance of newly identified historic and archeological resources, the eligibility of historic resources for the National Register, and the effects of each alternative on both listed and eligible historic resources. Where the draft EIS discusses eligibility for the National Register of archeological resources, the coordination with the SHPO on eligibility and effect should address both historic and archeological resources.

The draft EIS can serve as a vehicle for affording the Advisory Council on Historic Preservation (ACHP) an opportunity to comment pursuant to Section 106 requirements if the document contains the necessary information required by 36 CFR 800.8. The draft EIS transmittal letter to the ACHP should specifically request its comments pursuant to 36 CFR 800.6.

To the fullest extent possible, the final EIS needs to demonstrate that all the requirements of 36 CFR 800 have been met. If the preferred alternative has no effect on historic or archeological resources on or eligible for the National Register, the final EIS should indicate coordination with and agreement by the SHPO. If the preferred alternative has an effect on a resource on or eligible for the National Register, the final EIS should contain (a) a determination of no adverse effect concurred in by the Advisory Council on Historic Preservation, (b) an executed memorandum of agreement (MOA), or (c) in the case of a rare situation where FHWA is unable to conclude the MOA, a copyof comments transmitted from the ACHP to the FHWA and the FHWA response to those comments.

The proposed use of land from an historic resource on or eligible for the National Register will normally require an evaluation and approval under Section 4(f) of the DOT Act. Section 4(f) also applies to all archeological sites on or eligible for the National Register and which warrant preservation in place. (See Section IX for information on Section 4(f) evaluation.)

20. Hazardous Waste Sites

Hazardous waste sites are regulated by the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). During early planning, the location of permitted and nonregulated hazardous waste sites should be identified. Early coordination with the appropriate Regional Office of the EPA and the appropriate State agency will aid in identifying known or potential hazardous

P-047-014

waste sites. If known or potential waste sites are identified, the locations should be clearly marked on a map showing their relationship to the alternatives under consideration. If a known or potential hazardous waste site is affected by an alternative, information about the site, the potential involvement, impacts and public health concerns of the affected alternative(s), and the proposed mitigation measures to eliminate or minimize impacts or public health concerns should be discussed in the draft EIS.

If the preferred alternative impacts a known or potential hazardous waste site, the final EIS should address and resolve the issues raised by the public and government agencies.

21. Visual Impacts

The draft EIS should state whether the project alternatives have a potential for visual quality impacts. When this potential exists, the draft EIS should identify the impacts to the existing visual resource, the relationship of the impacts to potential viewers of and from the project, as well as measures to avoid, minimize, or reduce the adverse impacts. When there is potential for visual quality impacts, the draft EIS shouldexplain the consideration given to design quality, art, and architecture in the project planning. These values may be particularly important for facilities located in visually sensitive urban or rural settings. When a proposed project will include features associated with design quality, art or architecture, the draft EIS should be circulated to officially designated State and local arts councils and, as appropriate, other organizations with an interest in design, art, and architecture. The final EIS should identify any proposed mitigation for the preferred alternative.

22. Energy

Except for large scale projects, a detailed energy analysis including computations of BTU requirements, etc., is not needed. For most projects, the draft EIS should discuss in general terms the construction and operational energy requirements and conservation potential of various alternatives under consideration. The discussion should be reasonable and supportable. It might recognize that the energy requirements of various construction alternatives are similar and are generally greater than the energy requirements of the no-build alternative. Additionally, the discussion could point out that the post-construction, operational energy requirements of the facility should be less with the build alternative as opposed to the no-build alternative. In such a situation, one might conclude that the savings in operational energy requirements would more than offset construction energy requirements and thus, in the long term, result in a net savings in energy usage.

For large-scale projects with potentially substantial energy impacts, the draft EIS should discuss the major direct and/or indirect energy impacts and conservation potential of each alternative. Direct energy impacts refer to the energy consumed by vehicles using the facility. Indirect impacts include construction energy and such items as the effects of any changes in automobile usage. The alternative's relationship and consistency with a State and/or regional energy plan, if one exists, should also be indicated.

The final EIS should identify any energy conservation measures that will be implemented as a part of the preferred alternative. Measures to conserve energy include theuse of high-occupancy vehicle incentives and measures to improve traffic flow.

23. Construction Impacts

The draft EIS should discuss the potential adverse impacts (particularly air, noise, water, traffic congestion, detours, safety, visual, etc.) associated with construction of each alternative and identify appropriate mitigation measures. Also, where the impacts of obtaining borrow or disposal of waste material are important issues, they should be discussed in the draft EIS along with any proposed measures to minimize these impacts. The final EIS should identify any proposed mitigation for the preferred alternative.

24. The Relationship Between Local Short-term Uses of Man's Environment and the

P-047-014

Maintenance and Enhancement of Long-term Productivity

The EIS should discuss in general terms the proposed action's relationship of local short-term impacts and use of resources, and the maintenance and enhancement of long-term productivity. This general discussion might recognize that the build alternatives would have similar impacts. The discussion should point out that transportation improvements are based on State and/or local comprehensive planning which consider(s) the need for present and future traffic requirements within the context of present and future land use development. In such a situation, one might then conclude that the local short-term impacts and use of resources by the proposed action is consistent with the maintenance and enhancement of long-term productivity for the local area, State, etc.

25. Any Irreversible and Irretrievable Commitments of Resources Which Would be Involved in the Proposed Action

The EIS should discuss in general terms the proposed action's irreversible and irretrievable commitment of resources. This general discussion might recognize that the build alternatives would require a similar commitment of natural, physical, human, and fiscal resources. An example of such discussion would be as follows:

"Implementation of the proposed action involves a commitment of a range of natural, physical, human, and fiscal resources. Land used in the construction of the proposed facility is considered an irreversible commitment during the time period that the land is used for a highway facility. However, if a greater need arises for use of the land or if the highway facility is no longer needed, the land can be converted to another use. At present, there is no reason to believe such a conversion will ever be necessary or desirable.

Considerable amounts of fossil fuels, labor, and highway construction materials such as cement, aggregate, and bituminous material are expended. Additionally, large amounts of labor and natural resources are used in the fabrication and preparation of construction materials. These materials are generally not retrievable. However, they are not in short supply and their use will not have an adverse effect upon continued availability of these resources. Any construction will also require a substantial one-time expenditure of both State and Federal funds which are not retrievable.

The commitment of these resources is based on the concept that residents in the immediate area, State, and region will benefit by the improved quality of the transportation system. These benefits will consist of improved accessibility and safety, savings in time, and greater availability of quality services which are anticipated to outweigh the commitment of these resources."

H. List of Preparers

This section should include lists of:

1. State (and local agency) personnel, including consultants, who were primarily responsible for preparing the EIS or performing environmental studies, and a brief summary of their qualifications, including educational background and experience.
2. The FHWA personnel primarily responsible for preparation or review of the EIS and their qualifications.
3. The areas of EIS responsibility for each preparer.

I. List of Agencies, Organizations, and Persons to Whom Copies of the Statement are Sent

Draft EIS: List all entities from which commentsare being requested (40 CFR 1502.10). Final EIS: Identify those entities that submitted comments on the draft EIS and those receiving a copy of the final EIS (23 CFR 771.125(a) and (g)).

P-047-014

J. Comments and Coordination

1. The draft EIS should contain copies of pertinent correspondence with each cooperating agency, other agencies and the public and summarize: 1) the early coordination process, including scoping; 2) the meetings with community groups (including minority and non-minority interests) and individuals; and 3) the key issues and pertinent information received from the public and government agencies through these efforts.

2. The final EIS should include a copy of substantive comments from the U.S. Secretary of Transportation (OST), each cooperating agency, and other commentors on the draft EIS. Where the response is exceptionally voluminous the comments may be summarized. An appropriate response should be provided to each substantive comment. When the EIS text is revised as a result of the comments received, a copy of the comments should contain marginal references indicating where revisions were made, or the response to the comments should contain such references. The response should adequately address the issue or concern raised by the commentor or, where substantive comments do not warrant further response, explain why they do not, and provide sufficient information to support that position.

   The FHWA and the HA are not commentors within the meaning of NEPA and their comments on the draft EIS should not be included in the final EIS. However, the document should include adequate information for FHWA and the HA to ascertain the disposition of the comment(s).

3. The final EIS should (1) summarize the substantive comments on social, economic, environmental, and engineering issues made at the public hearing, if one is held, or the public involvement activities or which were otherwise considered and (2) discuss the consideration given to any substantive issue raised and provide sufficient information to support that position.

4. The final EIS should document compliance with requirements of all applicable environmental laws, Executive Orders, and other related requirements, such as Title VI of the Civil Rights Act of 1964. To the extent possible, all environmental issues should be resolved prior to the submission of the final EIS. When disagreement on project issues exists with another agency, coordination with the agency should be undertaken to resolve the issues. Where the issues cannot be resolved, the final EIS should identify any remaining unresolved issues, the steps taken to resolve the issues, and the positions of the respective parties. Where issues are resolved through this effort, the final EIS should demonstrate resolution of the concerns.

K. Index

The index should include important subjects and areas of major impacts so that a reviewer need not read the entire EIS to obtain information on a specific subject or impact.

L. Appendices

The EIS should briefly explain or summarize methodologies and results of technical analyses and research. Lengthy technical discussions should be contained in a technical report. Material prepared as appendices to the EIS should:

1. consist of material prepared specifically for the EIS;

2. consist of material which substantiates an analysis fundamental to the EIS;

3. be analytic and relevant to the decision to be made; and

4. be circulated with the EIS within FHWA, to EPA (Region), and to cooperating agencies and be readily available on request by other parties. Other reports and studies referred to in the EIS should be readily available for review or for copying at a convenient location.

CLXXXVIIIONS FOR PREPARING FINAL EISs

P-047-014 The CEQ regulations place heavy emphasis on reducing paperwork, avoiding unnecessary work, and producing documents which are useful to decisionmakers and to the public. With these objectives in mind, three different approaches to preparing final EISs are presented below. The first two approaches can be employed on any project. The third approach is restricted to the conditions specified by CEQ (40 CFR 1503.4(c)).

A. Traditional Approach

Under this approach, the final EIS incorporates the draft EIS (essentially in its entirety) with changes made as appropriate throughout the document to reflect the selection of an alternative, modifications to the project, updated information on the affected environment, changes in the assessment of impacts, the selection of mitigation measures, wetland and floodplain findings, the results of coordination, comments received on the draft EIS and responses to these comments, etc. Since so much information is carried over from the draft to the final, important changes are sometimes difficult for the readerto identify. Nevertheless, this is the approach most familiar to participants in the NEPA process.

B. Condensed Final EIS

This approach avoids repetition of material from the draft EIS by incorporating, by reference, the draft EIS. The final EIS is, thus, a much shorter document than under the traditional approach; however, it should afford the reader a complete overview of the project and its impacts on the human environment.

The crux of this approach is to briefly reference and summarize information from the draft EIS which has not changed and to focus the final EIS discussion on changes in the project, its setting, impacts, technical analysis, and mitigation that have occurred since the draft EIS was circulated. In addition, the condensed final EIS must identify the preferred alternative, explain the basis for its selection, describe coordination efforts, and include agency and public comments, responses to these comments, and any required findings or determinations (40 CFR 1502.14(e) and 23 CFR 771.125(a)).

The format of the final EIS should parallel the draft EIS. Each major section of the final EIS should briefly summarize the important information contained in the corresponding section of the draft, reference the section of the draft that provides more detailed information, and discuss any noteworthy changes that have occurred since the draft was circulated.

At the time that the final is circulated, an additional copy of the draft EIS need not be provided to those parties that received a copy of the draft EIS when it was circulated. Nevertheless, if, due to the passage of time or other reasons, it is likely that they will have disposed of their original copy of the draft EIS, then a copy of the draft EIS should be provided with the final. In any case, sufficient copies of the draft EIS should be on hand to satisfy requests for additional copies. Both the draft EIS and the condensed final EIS should be filed with EPA under a single final EIS cover sheet.

C. Abbreviated Version of Final EIS

The CEQ regulation (40 CFR 1503.4(c)) provides the opportunity to expedite the final EIS preparation where the only changes needed in the document are minor and consist of factual corrections and/or an explanation of why the comments received on the draft EIS do not warrant further response. In using this approach, care should be exercised to assure that the draft EIS contains sufficient information to make the findings in (2) below and that the number of errata sheets used to make required changes is small and that these errata sheets together with the draft EIS constitute a readable, understandable, full disclosure document. The final EIS should consist of the draft EIS and an attachment containing the following:

1. Errata sheets making any necessary corrections to the draft EIS;

2. A section identifying the preferred alternative and a discussion of the reasons it was selected. The following should also be included in this section where applicable:

P-047-014

(a) final Section 4(f) evaluations containing the information described in Section IX of these guidelines;

(b) wetland and finding(s);

(c) floodplain finding(s);

(d) a list of commitments for mitigation measures for the preferred alternative; and

3. Copies (or summaries) of comments received from circulation of the draft EIS and public hearing and responses thereto.

   Only the attachment need be provided to parties who received a copy of the draft EIS, unless it is likely that they will have disposed of their original copy, in which case both the draft EIS and the attachment should be provided (40 CFR 1503.4(c)). Both the draft EIS and the attachment must be filed with EPA under a single final EIS cover sheet(40 CFR 1503.4(c)).

CXCDISTRIBUTION OF EISs AND SECTION 4(f) EVALUATIONS

A. Environmental Impact Statement

1. After clearance by FHWA, copies of all draft EISs must be made available to the public and circulated for comments by the HA to: all public officials, private interest groups, and members of the public known to have an interest in the proposed action or the draft EIS; all Federal, State, and local government agencies expected to have jurisdiction, responsibility, interest, or expertise in the proposed action; and States and Federal land management entities which may be affected by the proposed action or any of the alternatives (40 CFR 1502.19 and 1503.1). Distribution must be made no later than the time the document is filed with EPA for Federal Register publication and must allow for a minimum 45-day review period (40 CFR 1506.9 and 1506.10). Internal FHWA distribution of draft and final EISs is subject to change and is noted in memorandums to the Regional Administrators as requirements change.

2. Copies of all approved final EISs must be distributed to all Federal, State, and local agencies and private organizations, and members of the public who provided substantive comments on the draft EIS or who requested a copy (40 CFR 1502.19). Distribution must be made no later than the time the document is filed with EPA for Federal Register publication and must allow for a minimum 30-day review period before the Record of Decision is approved (40 CFR 1506.9 and 1506.10). Two copies of all approved EISs should be forwarded to the FHWA Washington Headquarters (HEV-11) for recordkeeping purposes.

3. Copies of all EISs should normally be distributed to EPA and DOI as follows, unlessthe agency has indicated to the FHWA offices the need for a different number of copies:

   (a) The EPA Headquarters: five copies of the draft EIS and five copies of the final EIS (This is the "filing requirement" in Section 1506.9 of the CEQ regulation.) to the following address:

   Environmental Protection Agency
   Office of Federal Activities
   (A-104), 401 M Street, SW
   Washington, D.C. 20460

   (b) The appropriate EPA Regional Office responsible for EPA's review pursuant to Section 309 of the Clean Air Act: five copies of the draft EIS and five copies of the final EIS.

   (c) The DOI Headquarters to the following address:

P-047-014

U.S. Department of the Interior
Office of Environmental Project Review
Room 4239
18th and C Streets, NW
Washington, DC 20240

(i) All States in FHWA Regions 1, 3, 4, and 5, plus Hawaii, Guam, American Samoa, Virgin Islands, Arkansas, Iowa, Louisiana, and Missouri: 12 copies of the draft EIS and 7 copies of the final EIS.

(ii) Kansas, Nebraska, North Dakota, Oklahoma, South Dakota, and Texas: 13 copies of the draft EIS and 8 copies of the final EIS.

(iii) New Mexico and all States in FHWA Regions 8, 9, and 10,except Hawaii, North Dakota, and South Dakota: 14 copies of the draft EIS and 9 copies of the final EIS.

Note: DOI Headquarters will make distribution within its Department. While not required, advance distribution to DOI field offices may be helpful to expedite their review.

B. Section 4(f) Evaluation

If the Section 4(f) evaluation is included in a draft EIS, the DOI Headquarters does not need additional copies of the draft or final EIS/Section 4(f) evaluation. If the Section 4(f) evaluation is processed separately or as part of an EA, the DOI should receive seven copies of the draft Section 4(f) evaluation for coordination and seven copies of the final Section 4(f) evaluation for information. In addition to coordination with DOI, draft Section 4(f) evaluations must be coordinated with the officials having jurisdiction over the Section 4(f) property and the Department of Housing and Urban Development (HUD) and the United States Department of Agriculture (USDA) where these agencies have an interest in or jurisdiction over the affected Section 4(f) resource (23 CFR 771.135(i)). The point of coordination for HUD is the appropriate Regional Office and for USDA, the Forest Supervisor of the affected National Forest. One copy should be provided to the officials with jurisdiction and two copies should be submitted to HUD and USDA when coordination is required.

CXCVRECORD OF DECISION--FORMAT AND CONTENT

The Record of Decision (ROD) will explain the reasons for the project decision, summarize any mitigation measures that will be incorporated in the project, and document any required Section 4(f) approval. While cross-referencing and incorporation by reference of the final EIS (or final EIS supplement) and other documents are appropriate, the ROD must explain the basis for the project decision as completely as possible, based on the information contained in the EIS (40 CFR 1502.2). A draft ROD should be prepared by the HA and submitted to the Division Officewith the final EIS. The following key items need to be addressed in the ROD:

A. Decision.

Identify the selected alternative. Reference to the final EIS (or final EIS supplement) may be used to reduce detail and repetition.

B. Alternatives Considered.

This information can be most clearly organized by briefly describing each alternative and explaining the balancing of values which formed the basis for the decision. This discussion must identify the environmentally preferred alternative(s) (i.e., the alternative(s) that causes the least damage to the biological and physical environment) (40 CFR 1505.2(b)). Where the selected alternative is other than the environmentally preferable alternative, the ROD should clearly state the reasons for not selecting the environmentally preferred alternative. If lands protected by Section 4(f) were a factor in the selection of the preferred alternative, the ROD should explain how the Section 4(f) lands

P-047-014

influenced the selection.

The values (social, economic, environmental, cost-effectiveness, safety, traffic, service, community planning, etc.) which were important factors in the decisionmaking process should be clearly identified along with the reasons some values were considered more important than others. The Federal-aid highway program mandate to provide safe and efficient transportation in the context of all other Federal requirements and the beneficial impacts of the proposed transportation improvements should be included in this balancing. While any decision represents a balancing of the values, the ROD should reflect the manner in which these values were considered in arriving at the decision.

C. Section 4(f).

Summarize the basis for any Section 4(f) approval when applicable (23 CFR 771.127(a)). The discussion should include the key information supporting such approval. Where appropriate,this information may be included in the alternatives discussion above and referenced in this paragraph to reduce repetition.

D. Measures to Minimize Harm.

Describe the specific measures adopted to minimize environmental harm and identify those standard measures (e.g., erosion control, appropriate for the proposed action). State whether all practicable measures to minimize environmental harm have been incorporated into the decision and, if not, why they were not (40 CFR 1505.2(c)).

E. Monitoring or Enforcement Program.

Describe any monitoring or enforcement program which has been adopted for specific mitigation measures, as outlined in the final EIS.

F. Comments on Final EIS.

All substantive comments received on the final EIS should be identified and given appropriate responses. Other comments should be summarized and responses provided where appropriate.

For recordkeeping purposes, a copy of the signed ROD should be provided to the Washington Headquarters (HEV-11). For a ROD approved by the Division Office, copies should be sent to both the Washington Headquarters and the Regional Office.

CCI SECTION 4(f) EVALUATIONS--FORMAT AND CONTENT

A Section 4(f) evaluation must be prepared for each location within a proposed project before the use of Section 4(f) land is approved (23 CFR 771.135(a)). For projects processed with an EIS or an EA/FONSI, the individual Section 4(f) evaluation should be included as a separate section of the document, and for projects processed as categorical exclusions, as a separate Section 4(f) evaluation document. Pertinent information from various sections of the EIS or EA/FONSI may be summarized in the Section 4(f) evaluation to reduce repetition. Where an issue on constructive use Section 4(f) arises and FHWA decides that Section 4(f) does not apply, the environmental document should contain sufficientanalysis and information to demonstrate that the resource(s) is not substantially impaired.

The use of Section 4(f) land may involve concurrent requirements of other Federal agencies. Examples include consistency determinations for the use of public lands managed by the Bureau of Land Management, compatibility determinations for the use of land in the National Wildlife Refuge System and the National Park System, determinations of direct and adverse effects for Wild and Scenic Rivers, and approval of land conversions under Section 6(f) of the Land and Water Conservation Fund Act. The mitigation plan developed for the project should include measures which would satisfy the various requirements. For example, Section 6(f) directs the Department of the Interior (National Park Service) to assure that replacement lands of equal value, location, and usefulness are provided as conditions to approval of land conversions. Therefore, where a Section 6(f) land conversion is proposed for a highway project, replacement land will be necessary. Regardless of the mitigation proposed, the draft and final

P-047-014 Section 4(f) evaluations should discuss the results of coordination with the public official having jurisdiction over the Section 4(f) land and document the National Park Service's position on the Section 6(f) land transfer, respectively.

A. Draft Section 4(f) Evaluation

The following format and content are suggested. The listed information should be included in the Section 4(f) evaluation, as applicable.

1. Proposed Action.

   Where a separate Section 4(f) evaluation is prepared, describe the proposed project and explain the purpose and need for the project.

2. Section 4(f) Property.

   Describe each Section 4(f) resource which would be used by any alternative under consideration. The following information should be provided:

   (a) A detailed map or drawing of sufficient scale to identify the relationship of the alternatives to the Section 4(f) property.

   (b) Size (acres or square feet) and location (maps or other exhibits such as photographs, sketches, etc.) of the affected Section 4(f) property.

   (c) Ownership (city, county, State, etc.) and type of Section 4(f) property (park, recreation, historic, etc.).

   (d) Function of or available activities on the property (ball playing, swimming, golfing, etc.).

   (e) Description and location of all existing and planned facilities (ball diamonds, tennis courts, etc.).

   (f) Access (pedestrian, vehicular) and usage (approximate number of users/visitors, etc.).

   (g) Relationship to other similarly used lands in the vicinity.

   (h) Applicable clauses affecting the ownership, such as lease, easement, covenants, restrictions, or conditions, including forfeiture.

   (i) Unusual characteristics of the Section 4(f) property (flooding problems, terrain conditions, or other features) that either reduce or enhance the value of all or part of the property.

3. Impacts on the Section 4(f) Property(ies).

   Discuss the impacts on the Section 4(f) property for each alternative (e.g., amount of land to be used, facilities andfunctions affected, noise, air pollution, visual, etc.). Where an alternative (or alternatives) uses land from more than one Section 4(f) property, a summary table would be useful in comparing the various impacts of the alternative(s). Impacts (such as facilities and functions affected, noise, etc.) which can be quantified should be quantified. Other impacts (such as visual intrusion) which cannot be quantified should be described.

4. Avoidance Alternatives.

   Identify and evaluate location and design alternatives which would avoid the Section 4(f) property. Generally, this would include alternatives to either side of the property. Where an alternative would use land from more than one Section 4(f) property, the analysis needs to

P-047-014

evaluate alternatives which avoid each and all properties (23 CFR 771.135(i)). The design alternatives should be in the immediate area of the property and consider minor alignment shifts, a reduced facility, retaining structures, etc. individually or in combination, as appropriate. Detailed discussions of alternatives in an EIS or EA need not be repeated in the Section 4(f) portion of the document, but should be referenced and summarized. However, when alternatives (avoiding Section 4(f) resources) have been eliminated from detailed study the discussion should also explain whether these alternatives are feasible and prudent and, if not, the reasons why.

5. Measures to Minimize Harm.

   Discuss all possible measures which are available to minimize the impacts of the proposed action on the Section 4(f) property(ies). Detailed discussions of mitigation measures in the EIS or EA may be referenced and appropriately summarized, rather than repeated.

6. Coordination.

   Discuss the results of preliminary coordination with the public official having jurisdiction over the Section 4(f) property and with regional (or local) offices of DOI and, as appropriate, the Regional Office of HUD and the Forest Supervisor of the affected National Forest. Generally, the coordination should include discussion of avoidance alternatives, impacts tothe property, and measures to minimize harm. In addition, the coordination with the public official having jurisdiction should include, where necessary, a discussion of significance and primary use of the property.

   Note:The conclusion that there are no feasible and prudent alternatives is not normally addressed at the draft Section 4(f) evaluation stage. Such conclusion is made only after the draft Section 4(f) evaluation has been circulated and coordinated and any identified issues adequately evaluated.

B. Final Section 4(f) Evaluation

When the preferred alternative uses Section 4(f) land, the final Section 4(f) evaluation must contain (23 CFR 771.135(i) and (j)):

1. All the above information for a draft evaluation.

2. A discussion of the basis for concluding that there are no feasible and prudent alternatives to the use of the Section 4(f) land. The supporting information must demonstrate that "there are unique problems or unusual factors involved in the use of alternatives that avoid these properties or that the cost, social, economic, and environmental impacts, or community disruption resulting from such alternatives reach extraordinary magnitudes" (23 CFR 771.135(a)(2)). This language should appear in the document together with the supporting information.

3. A discussion of the basis for concluding that the proposed action includes all possible planning to minimize harm to the Section 4(f) property. When there are no feasible and prudent alternatives which avoid the use of Section 4(f) land, the final Section 4(f) evaluation must demonstrate that the preferredalternative is a feasible and prudent alternative with the least harm on the Section 4(f) resources after considering mitigation to the Section 4(f) resources.

4. A summary of the appropriate formal coordination with the Headquarters Offices of DOI (and/or appropriate agency under that Department) and, as appropriate, the involved offices of USDA and HUD.

5. Copies of all formal coordination comments and a summary of other relevant Section 4(f) comments received an analysis and response to any questions raised. Where new alternatives or modifications to existing alternatives are identified and will not be given

P-047-014

further consideration, the basis for dismissing these alternatives should be provided and supported by factual information. Where Section 6(f) land is involved, the National Park Service's position on the land transfer should be documented.

6. Concluding statement as follows: "Based upon the above considerations, there is no feasible and prudent alternative to the use of land from the (identify Section 4(f) property) and the proposed action includes all possible planning to minimize harm to the (Section 4(f) property) resulting from such use."

CCXOTHER AGENCY STATEMENTS

A. The FHWA review of statements prepared by other agencies will consider the environmental impact of the proposal on areas within FHWA's functional area of responsibility or special expertise (40 CFR 1503.2).

B. Agencies requesting comments on highway impacts usually forward the draft EIS to the FHWA Washington Headquarters for comment. The FHWA Washington Headquarters will normally distribute these EISs to the appropriate Regional or Division Office (per Regional Office request) and will indicate where the comments should be sent. The Regional Office may elect to forward the draft statement to the Division Office for response.

C. When a field office has received a draft EIS directly from another agency, it may comment directly to that agency if the proposal does not fall within the types indicated in item (d) of this section. If more than one DOT Administration is commenting at the Regional level, the comments should be coordinated by the DOT Regional Representative to the Secretary or designee. Copies of the FHWA comments should be distributed as follows:

1. Requesting agency--original and one copy.
2. P-14--one copy.
3. DOT Secretarial Representative--one copy.
4. HEV-11--one copy.

D. The following types of actions contained in the draft EIS require FHWA Washington Headquarters review and such EISs should be forwarded to the Director, Office of Environmental Policy, along with Regional comments, for processing:

1. actions with national implications, and
2. legislation or regulations having national impacts or national program proposals.

CCXREEVALUATIONS

A. Draft EIS Reevaluation

If an acceptable final EIS is not received by FHWA within 3 years from the date of the draft EIS circulation, then a written evaluation is required to determine whether there havebeen changes in the project or its surroundings or new information which would require a supplement to the draft EIS or a new draft EIS (23 CFR 771.129(a)). The written evaluation should be prepared by the HA in consultation with FHWA and should address all current environmental requirements. The entire project should be revisited to assess any changes that have occurred and their effect on the adequacy of the draft EIS.

There is no required format for the written evaluation. It should focus on the changes in the project, its surroundings and impacts, and any new issues identified since the draft EIS. Field reviews, additional studies (as necessary), and coordination (as appropriate) with other agencies should be undertaken and the results included in the written evaluation. If, after reviewing the written evaluation, the FHWA concludes that a supplemental EIS or a new draft EIS is not required, the

P-047-014

decision should be appropriately documented. Since the next major step in the project development process is preparation of a final EIS, the final EIS may document the decision. A statement to this fact, the conclusions reached, and supporting information should be briefly summarized in the Summary Section of the final EIS.

B. Final EIS Reevaluation

There are two types of reevaluations required for a final EIS: consultation and written evaluation (23 CFR 771.129(b) and (c)). For the first, consultation, the final EIS is reevaluated prior to proceeding with major project approval (e.g., right-of-way acquisition, final design, and plans, specifications, and estimates (PS&E)) to determine whether the final EIS is still valid. The level of analysis and documentation, if any, should be agreed upon by the FHWA and HA. The analysis and documentation should focus on and be commensurate with the changes in the project and its surroundings, potential for controversy, and length of time since the last environmental action. For example, when the consultation occurs shortly after final EIS approval, an analysis usually should not be necessary. However, when it occurs nearly 3 years after final EIS approval, but before a written evaluation is required, the level of analysis should be similar to what normally would be undertaken for a written evaluation. Although written documentation is left to the discretion of the DivisionAdministrator, it is suggested that each consultation be appropriately documented in order to have a record to show the requirement was met.

The second type of reevaluation is a written evaluation. It is required if the HA has not taken additional major steps to advance the project (i.e., has not received from FHWA authority to undertake final design, authority to acquire a significant portion of the right-of-way, or approval of the PS&E) within any 3-year time period after approval of the final EIS, the final supplemental EIS, or the last major FHWA approval action.

The written evaluation should be prepared by the HA in consultation with FHWA and should address all current environmental requirements. The entire project should be revisited to assess any changes that have occurred and their effect on the adequacy of the final EIS.

There is no required format for the written evaluation. It should focus on the changes in the project, its surroundings and impacts, and any new issues identified since the final EIS was approved. Field reviews, additional environmental studies (as necessary), and coordination with other agencies should be undertaken (as appropriate to address any new impacts or issues) and the results included in the written evaluation. The FHWA Division Office is the action office for the written evaluation. If it is determined that a supplemental EIS is not needed, the project files should be documented appropriately. In those rare cases where an EA is prepared to serve as the written evaluation, the files should clearly document whether new significant impacts were identified during the reevaluation process.

CCXS SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENTS (EISs)

Whenever there are changes, new information, or further developments on a project which result in significant environmental impacts not identified in the most recently distributed version of the draft or final EIS, a supplemental EIS is necessary (40 CFR 1502.9(c)). If it is determined that the changes or new information do not result in new or different significant environmental impacts, the FHWA Division Administrator should document the determination. (After final EIS approval, this documentation could take the form of notationto the files; for a draft EIS, this documentation could be a discussion in the final EIS.)

A. Format and Content of a Supplemental EIS

There is no required format for a supplemental EIS. The supplemental EIS should provide sufficient information to briefly describe the proposed action, the reason(s) why a supplement is being prepared, and the status of the previous draft or final EIS. The supplemental EIS needs to address only those changes or new information that are the basis for preparing the supplement and were not addressed in the previous EIS (23 CFR 771.130(a)). Reference to and summarizing the previous EIS is preferable to repeating unchanged, but still valid, portions of the original document. For example, some items such as affected environment, alternatives, or impacts which are

P-047-014

unchanged may be briefly summarized and referenced. New environmental requirements which became effective after the previous EIS was prepared need to be addressed in the supplemental EIS to the extent they apply to the portion of the project being evaluated and are relevant to the subject of the supplement (23 CFR 771.130(a)). Additionally, to provide an up-to-date status of compliance with NEPA, it is recommended that the supplement summarize the results of any reevaluations that have been performed for portions of or the entire proposed action. By this inclusion, the supplement will reflect an up-to-date consideration of the proposed action and its effects on the human environment. When a previous EIS is referenced, the supplemental EIS transmittal letter should indicate that copies of the original (draft or final) EIS are available and will be provided to all requesting parties.

B. Distribution of a Supplemental EIS

A supplemental EIS will be reviewed and distributed in the same manner as a draft and final EIS (23 CFR 771.130(d)). (See Section VII for additional information.)

XII. Appendices

Two appendices are included as follows:

Appendix A:Environmental Laws, Authority, and Related Statutes and Orders

Appendix B:Preparation and Processing of Notices of Intent.

ENVIRONMENTAL LAWS, AUTHORITY, AND RELATED STATUTES AND ORDERS

AUTHORITY:

42 United States Code (U.S.C.) 4321 et seq., National Environmental Policy Act of 1969, as amended.

23 U.S.C. 138 and 49 U.S.C. 303, Section 4(f) of the Department of Transportation (DOT) Act of 1966.

23 U.S.C. 109(h), (i), and (j) standards.

23 U.S.C. 128, Public Hearings.

23 U.S.C. 315, Rules, Regulations, and Recommendations.

23 Code of Federal Regulations (CFR), Part 771, Environmental Impact and Related Procedures.

40 CFR 1500 et seq., Council on Environmental Quality, Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act.

49 CFR 1.48(b), DOT Delegations of Authority to the Federal Highway Administration.

DOT Order 5610.1c, Procedures for Considering Environmental Impacts, September 18, 1979, and subsequent revisions.

RELATED STATUTES AND ORDERS: The following is a list of major statutes and orders on the preparation of environmental documents.

7 U.S.C. 4201 et seq., Farmland Protection Policy Act of 1981.

16 U.S.C. 461 et seq., Archaeological and Historic Preservation Act; and 23 U.S.C. 305.

16 U.S.C. 470f, Sections 106, 110(d), and 110(f) of the National Historic Preservation Act of 1966.

16 U.S.C. 662, Section 2 of the Fish and Wildlife Coordination Act.

P-047-014

16 U.S.C. 1452, 1456, Sections 303 and 307 of the Coastal Zone Management Act of 1972.

16 U.S.C. 1271 et. seq., Wild and Scenic Rivers Act.

16 U.S.C. 1536, Section 7 of the Endangered Species Act of 1973.

33 U.S.C. 1251 et seq., Clean Water Act of 1977.

33 U.S.C 1241 et seq., Resource Conservation and Recovery Act.

42 U.S.C. 300(f) et seq., Safe Drinking Water Act.

42 U.S.C. 4371 et seq., Environmental Quality Improvement Act of 1970.

42 U.S.C. 4601 et seq., Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

42 U.S.C. 4901 et seq., Noise Control Act of 1972.

42 U.S.C. 9601 et seq., Comprehensive Environmental Response, Compensation, and Liability Act of 1980.

42 U.S.C. 7401 et seq., Clean Air Act.

42 U.S.C. 2000d-d4, Title VI of the Civil Rights Act of 1964.

43 U.S.C. Coastal Barriers Resources Act of 1982.

Executive Order 11514, Protection and Enhancement of Environmental Quality, as amended by Executive Order 11991, dated May 24, 1977.

Executive Order 11593, Protection and Enhancement of the Cultural Environment, dated May 13, 1971, implemented by DOT Order 5650.1, dated, November 20, 1972.

Executive Order 11988, Floodplain Management, dated May 24, 1977, implemented by DOT Order 5650.2, dated April 23, 1979.

Executive Order 11990, Protection of Wetlands, dated May 24, 1977, implemented by DOT Order 5660.1A, dated August 24, 1978.

Preparation and Processing of Notices of Intent

The CEQ regulations and Title 23, Code of Federal Regulations, Part 771, Environmental Impact and Related Procedures, require the Administration to publish a notice of intent in the Federal Register as soon as practicable after the decision is made to prepare an environmental impact statement (EIS) and before the scoping process (40 CFR 1501.7). A notice of intent will also be published when a decision is made to supplement a final EIS, but will not be necessary when preparing a supplement to a draft EIS (23 CFR 771.130(d)). The responsibility for preparing notices of intent has been delegated to Regional Federal Highway Administrators and subsequently redelegated to Division Administrators. The notice should be sent directly to the Federal Register at the address provided in Attachment 1 and a copy provided to the Project Development Branch (HEV-11), Office of Environmental Policy, and the appropriate Region Office.

In cases where a notice of intent is published in the Federal Register and a decision is made not to prepare the draft EIS or, when the draft EIS has been prepared, a decision is made not to prepare a final EIS, a revised notice of intent should be published in the Federal Register advising of the decision and the reasons for not preparing the EIS. This applies to future and current actions being processed.

Notices of intent should be prepared and processed in strict conformance with the guidelines in Attachment 1 in order to ensure acceptance for publication by the Office of the Federal Register. A sample of each notice of intent for preparation of an EIS and a supplemental EIS is provided as Attachment 2.

P-047-014

The Project Development Branch (HEV-11) will serve as the Federal Register contact point for notice of intent. All inquiries should be directed to that office.

GUIDELINES FOR PREPARATION AND PROCESSING OF NOTICES OF INTENT

FORMAT

1. Typed in black on white bond paper.
2. Paper size: 8 1/2" x 11".
3. Margins: Left at least 1 1/2", all others 1".
4. Spacing: All material double spaced (except title in heading).
5. Heading: Four items on first page at head of document (see Attachment 2):
   - Billing Code No. 4910-22 typed in brackets or parentheses
   - DEPARTMENT OF TRANSPORTATION (all upper case)
   - Federal Highway Administration
   - ENVIRONMENTAL IMPACT STATEMENT; COUNTY OR CITY, STATE (all upper case; single space)
6. Text: Five sections - AGENCY, ACTION, SUMMARY, FOR FURTHER INFORMATION CONTACT, AND SUPPLEMENTARY INFORMATION; each section title in upper case followed by colon (see Content (below) and Samples 1 and 2).
7. Closing:
   - Include the Catalog of Federal Domestic Assistance number and title
   - Issued on:

     (indent 5 spaces and type or stamp in date when document is signed)
   - Signature line

     (begin in middle of page; type name, title, and city under the signature; use name and title of the officialactually signing the document (e.g., "John Doe, District Engineer," not "John Doe, for the Division Administrator"))
8. Document should be neat and in form suitable for public inspection. Two or more notices of intent can be included in a single document by making appropriate revisions to the heading and text of the document.

CONTENT

1. AGENCY: Federal Highway Administration (FHWA), DOT.
2. ACTION: Notice of Intent.
3. SUMMARY: The FHWA is issuing this notice to advise the public that an environmental impact statement will be prepared for a proposed highway project in . . . .
4. FOR FURTHER INFORMATION CONTACT: This section should state the name and address of a person or persons within the FHWA Division Office who can answer questions about the proposed action and the EIS as it is being developed. The listing of a telephone number is optional. State and/or local officials may also be listed, but always following the FHWA contact person.

P-047-014

8. SUPPLEMENTARY INFORMATION: This section should contain:

   a. a brief narrative description of the proposed action (e.g., location of the action, type of construction, length of the project, needs which will be fulfilled by the action);

      For a supplement to a final EIS add: the original EIS number and approval date, and the reason(s) for preparing the supplement;

   b. a brief description of possible alternatives to accomplish the goals of the proposed action (e.g., upgrade existing facility, do nothing (should always be listed), construction on new alignment, mass transit, multi-modal design); and

   c. a brief description of the proposed scoping process for the particular action including whether, when, and where any scoping meeting will be held.

      For a supplement to a final EIS: the scoping process is not required for a supplement; however, scoping should be discussed to the extent anticipated for the development of the supplement;

      In drafting this section -

      - use plain English
      - avoid technical terms and jargon
      - always refer to the proposed action or proposed project (e.g., the proposed action would . . .)
      - identify all abbreviations
      - list FHWA first when other agencies (State or local) are listed as being involved in the preparation of the EIS

PROCESSING

1. Send three (3) duplicate originals each signed in ink by the issuing officer to:

   Office of the Federal Register
   National Archives and Records Administration
   Washington, DC 20408

2. The duplicates must be identical in all respects. The Federal Register will accept electrostatic copies as long as they are readable and individually signed.

3. Three (3) additional copies are required if material is printed on both sides. If a single original and two certified copies are sent, the statement "CERTIFIED TO BE A TRUE COPY OF THE ORIGINAL" and the signature of a duly authorized certifying officer must appear on each certified copy.

4. A record should be kept of the date on which each notice is mailed to the Federal Register.

5. Send one (1) copy each to the Project Development Branch (HEV-11) and the Regional office.

S A M P L E 1

[4910-22]

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

ENVIRONMENTAL IMPACT STATEMENT: WASHINGTON COUNTY, WASHINGTON

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Notice of Intent.

P-047-014 SUMMARY: The FHWA is issuing this notice to advise the public that an environmental impact statement will be prepared for a proposed highway project in Washington County, Washington.

FOR FURTHER INFORMATION CONTACT: James West, District Engineer, Federal Highway Administration, 400 Market Street, State Capital, Washington 98507, Telephone: (206) 222-2222.

SUPPLEMENTARY INFORMATION: The FHWA, in cooperation with the Washington Department of Transportation and the Washington County Highway Department, will prepare an environmental impact statement (EIS) on a proposal to improve U.S. Route 10 (U.S. 10) in Washington County, Washington. The proposed improvement would involve the reconstruction of the existing U.S. 10 between the towns of Eastern and Western for a distance of about 20 miles.

Improvements to the corridor are considered necessary to provide for the existing and projected traffic demand. Also included in this proposal is the replacement of the existing East End Bridge and a new interchange with Washington Highway 20 (W.H. 20) west of Eastern. Alternatives under consideration include (1) taking no action; (2) using alternate travel modes; (3) widening the existing two-lane highway to four lanes; and (4) constructing a four-lane, limited access highway on new location. Incorporated into and studied with the various build alternatives will be design variations of grade and alignment.

Letters describing the proposed action and soliciting comments will be sent to appropriate Federal, State, and local agencies, and to private organizations and citizens who have previously expressed or are known to have interest in this proposal. A series of public meetings will be held in Eastern and Western between May and June 1985. In addition, a public hearing will be held. Public notice will be given of the time and place of the meetings and hearing. The draft EIS will be available for public and agency review and comment prior to the public hearing. No formal scoping meeting is planned at this time.

To ensure that the full range of issues related to this proposed action are addressed and all significant issues identified, comments, and suggestions are invited from allinterested parties. Comments or questions concerning this proposed action and the EIS should be directed to the FHWA at the address provided above.

(Catalog of Federal Domestic Assistance Program Number 20.205, Highway Planning and Construction. The regulations implementing Executive Order 12372 regarding intergovernmental consultation on Federal programs and activities apply to this program.)

Issued on: March 26, 1985.

John Doe
Division Administrator
Capital

S A M P L E 2

[4910-22]

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

ENVIRONMENTAL IMPACT STATEMENT: WASHINGTON COUNTY, WASHINGTON

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Notice of Intent.

P-047-034

SUMMARY: The FHWA is issuing this notice to advise the public that a supplement to a final environmental impact statement will be prepared for a proposed highway project in Washington County, Washington.

FOR FURTHER INFORMATION CONTACT: James West, District Engineer, Federal Highway Administration, 400 Market Street, State Capital, Washington 98507, Telephone: (206) 222-2222.

SUPPLEMENTARY INFORMATION: The FHWA, in cooperation with the Washington Department of Transportation and the Washington County Highway Department, will prepare a supplement to the final environmental impact statement (EIS) on a proposal to improve U.S. Route 10 (U.S. 10) in Washington County, Washington. The original EIS for the improvements (FHWA-WA-EIS-85-06-F) was approved on December 21, 1985. The proposed improvements to U.S. 10 provide a divided four-lane, limited access highway on new location between the towns of Western and Eastern for a distance of about 20 miles. Improvements to the corridor are considered necessary to provide for existing and projected traffic demand.

The location and preliminary design of the western 15 miles portion of the proposed facility, from Western to U.S. 20, have been approved. However, substantial changes in the local street system and land use development in Eastern have reduced the suitability of the approved location east of U.S. 20. The portion of the proposed facility east of U.S. 20 is now to be restudied to determine if a new route location and connection to I-90 would be appropriate.

Alternatives under consideration include (1) taking no action and terminating the facility at U.S. 20; (2) constructing a four-lane, limited access highway on the approved location; (3) widening the existing two-lane U.S. 10 to four lanes with a connection to U.S. 20; and (4) constructing a four-lane, limited access highway on new location and connecting to I-90. Incorporated into and studied with the various build alternatives will be design variations of grade and alignment.

Letters describing the proposed action and soliciting comments will be sent to appropriate Federal, State, and local agencies, and to private organizations and citizens who havepreviously expressed or are known to have interest in this proposal. A public meeting will be held in Eastern in August 1987. In addition, a public hearing will be held. Public notice will be given of the time and place of the meeting and hearing. The draft supplemental EIS will be available for public and agency review and comment prior to the public hearing. No formal scoping meeting will be held.

To ensure that the full range of issues related to this proposed action are addressed and all significant issues identified, comments and suggestions are invited from all interested parties. Comments or questions concerning this proposed action and the EIS should be directed to the FHWA at the address provided above.

(Catalog of Federal Domestic Assistance Program Number 20.205, Highway Research, Planning, and Construction. The regulations implementing Executive Order 12372 regarding intergovernmental consultation on Federal programs and activities apply to this program.)

Issued on: April 23, 1987.

John Doe
Division Administrator
Capital

Hines, Maurice

From: Tiffany Couch [TCouch@acuityforensics.com]
Sent: Monday, October 24, 2011 10:15 PM
To: Columbia River Crossing
Subject: FEIS Comments

P-048-001

We have an opportunity at this point in time to call a time out to the CRC project and to put this project back on track. Traffic impediments in our area affect commerce and mobility.

The CRC Project Office purports that their current project will:

- Alleviate Congestion
- Improve Freight Mobility
- Improve Public Transportation (reliability, connectivity)
- Provide a Safer Crossing
- Improve bicycle and pedestrian access
- Improve seismic vulnerability

When you read the words on the immaculate reports that this office has created, they all ***sound just right.*** They ***sound*** exactly like the solutions most of us are looking for.

However, when one just simply scratches the surface, it becomes apparent that the words are just that....words. The work that has been performed by numerous experts (many of whom remain unpaid); has uncovered astounding anomalies in the work performed by the CRC Project Office. In fact, the body of work presented by outside experts causes one to realize that the "purpose and need" of this CRC project isn't being addressed at all.

From the start, there have been serious breakdowns in process:

P-048-002

- When an agency is charged with spending precious taxpayer dollars, mustn't that agency also have proper financial reporting? **The CRC has no basic financial statements.** In fact, reporting from their accounting system has uncovered problems reconciling total project expenditures.

P-048-003

- When an agency realizes a project must be completed using outside contractors, mustn't there be proper bidding, contracting, and payment processes and procedures? **The CRC does not appear to have followed basic contracting principles**. Why did only a single bidder submit qualifications? Why does it happen to be the same vendor who has been awarded all major

1

P-048-001

Significant work has gone into developing the CRC project, including an ongoing public involvement effort. The public involvement program includes numerous advisory groups to ensure that the values and interests of the community are reflected in project decisions. These groups include representatives of public agencies, businesses, civic organizations, neighborhoods, and freight, commuter and environmental groups. Feedback from the general public and advisory groups has been generally supportive of the project, including support for the transit, bicycle, pedestrian, highway, interchange, and financing elements of the project. See Chapter 2 (Section 2.7) of the FEIS for more discussion on the process used to develop project alternatives and select a Locally Preferred Alternative.

P-048-002

The project takes these charges very seriously. Recently the project has introduced new accounting measures and provides monthly updates on the project website. If there are specific financial data that you would like to review, please contact the project office.

P-048-003

Numerous other contractors work with both the Oregon and Washington DOTs. And, as the project prepares for the start of construction, new contractors will be selected, and the values of those contracts will, in fact, be larger than the contract for the alternatives analysis and environmental process. Much like with residential contracting (such as plumbers), the team that begins the work is often best able to complete the work and is most familiar with the data, related analyses, and negotiations among local agencies.

P-048-003

contracts in recent Oregon and Washington history? Why does it happen to be the same vendor who also did all of the previous "I-5" studies for WSDOT?

P-048-004

- When an agency pays bills, shouldn't all expenditures be tracked in the appropriate fund? **The CRC has not tracked all expenditures of this project in a separate fund**. So far, we have traced over $18M (of $125M) in unknown expenditures. The CRC project office has provided us a white paper explaining to a Certified Public Accountant what a "journal entry" is; but has not provided any reporting to explain the purpose of the journal entries that effectively transferred expenditures from one fund into the "CRC Fund".

P-048-005

The accounting anomalies we continue to uncover are truly astounding. But what is most astounding is the body of evidence produced by other experts who have pointed out ***significant*** issues with this project. When this many significant issues arise, governing bodies must call a time out, call attention to the issues, and work to solve them.

Other experts have pointed out the following:

- **The Rose Quarter Bottleneck**
  - The bottleneck at the Rose Quarter is currently (and will continue to be) a significant bottleneck on the I-5 Corridor. An independent study commissioned by the City of Portland (http://portlandtransport.com/documents/URS_CRC_Report_July_7_2010.pdf) as recently as 2010 indicates that southbound commuters will save ***1 minute*** on their southbound commute. The primary cause of this is related to the bottleneck at the Rose Quarter...where traffic narrows to two through lanes and one dedicated exit lane.
- We've heard Ms. Boyd indicate that the CRC Project can't "fix everything" at once; however, there are NO PLANS to fix the Rose Quarter Bottleneck.

- **Bridge Design Issues**

P-048-006

  - The Independent Review Panel indicated that the bridge that had been planned for could not be built. http://www.columbian.com/news/2011/feb/03/engineers-report-endorses-crossing-project/

P-048-007

  - Mr. Kevin Peterson, an expert on numerous international projects, has put forth a bridge design that could be built more safely and more cost-effective than the current project. Yet, the Project Office did not fully study this design (as required by NEPA).

P-048-004

The Columbia River Crossing project is a joint project of the Oregon and Washington state departments of transportation. ODOT and WSDOT provide financial accounting services and oversight for the project in compliance with applicable state and federal laws, regulations and policies. Expenditures on the CRC project by ODOT and/or WSDOT are tracked within department accounting systems using unique identifiers which allow for project specific reporting.

In response to public records requests, the project has worked with ODOT and WSDOT accounting and other offices to gather and provide complete project expenditures lists, contracts and invoices as specifically requested, as well as respond to questions about the data and information provided. There are no unknown expenditures. Journal vouchers are used to conduct accounting transactions between subsystems which interface with WSDOT's accounting system. Expense detail for any specific journal voucher is available and retained according to approved retention schedules by WSDOT. The project office uses software to manage the project day-to-day. This software is used to track project finances for project management purposes. Information in this software is reconciled with the accounting records of each state monthly.

P-048-005

The Oregon Department of Transportation (ODOT) completed Phase I construction of the I-5 Delta Park widening project in fall 2010. Phase I of the project involved widening I-5 and lengthening the entrance and exit ramps at Victory Boulevard and Columbia Boulevard. Phase II involves improving local streets and will begin when funding is secured. Phase I of the Delta Park project widened the current 2-lane segment of southbound I-5 to 3 lanes. There are currently no immediate plans to widen I-5 south of Delta Park. Neither the CRC project nor the Delta Park projects are intended to address the southbound traffic congestion that currently exists near the I-5/I-405 split. However, traffic analyses

P-048-007

(Please contact me for white paper(s) submitted by Mr. Peterson over the last 18 months).

- **Financing Issues**

P-048-008

  - Mr. Joe Cortright, an economist in Portland conducted an extensive study. His findings indicate that the Project Office has used significantly flawed assumptions AND out of date traffic studies, creating a potential $500M revenue shortfall.
  - Oregon State Treasurer's office commissioned a study by two separate experts who concurred.

- **Total Cost**

P-048-009

  - Mr. Cortright points out that financing costs (interest, finance charges, etc.) have not been included in reports to the product. The costs could exceed $2B.
  - Operation and Maintenance Costs for the bridge, rail lines, and tolling facilities are NOT included in the price of the bridge.
  - Total costs of the bridge, financing costs, and O&M costs, are estimated to exceed ***$10B.***
  - Please contact me for Mr. Cortright's Study

- **Transit Issues**

P-048-010

  - Light Rail Times from downtown Vancouver to downtown Portland will exceed CURRENT express bus lines and will exceed current single occupancy vehicle times. (By 15 to 20 minutes ***per trip).***
  - Light Rail has been voted down
  - The Light Rail portion of this project is estimated to cost in excess of $1 Billion
  - Light Rail is highly subsidized and expensive
  - Buses, BRT, and other options are less expensive!
  - Please contact me for studies related to transit issues

- **Bidding and Contract Issues**

P-048-011

  - Only a single vendor (David Evans) submitted a bid for this project
  - The Call for Consultants indicate the EIS project will "exceed $20M"
    - Funding available was just $6 M
  - Contract for $50M is executed less than 90 days after call for consultants
    - Current Contract is slated at ***$105M.***

3

show the congestion at the split will not be worsened because of the Columbia River Crossing project. The main reason is that fewer cars are expected to cross the river with a project in 2030 than without a project. This is due to the provision of improved transit service and tolling.

Beyond the CRC and Delta Park projects, the I-5 Transportation and Trade Partnership Final Strategic Plan recommended a comprehensive list of modal actions relating to: additional transit capacity and service; additional rail capacity; land use and land use accord; transportation demand/system management; environmental justice; additional elements and strategies (such as new river crossings); and financing. RTC and Metro are tasked with initiating recommendations as part of their regional transportation planning role. Examples of current efforts include RTC's evaluation of future high-capacity transit in Clark County, and evaluation of needs for future river crossings. Regional planners have investigated solutions to existing bottlenecks at the I-5 connections with I-405 and I-84. ODOT is responsible for conducting ongoing studies to identify other congestion problems on I-5 in Oregon that may need to be addressed in the future.

P-048-006

The Bridge Expert Review Panel considered the suggestions from the Independent Review Panel, and recommended three bridge types to the project. The Selected Alternative includes one of those types, as discussed in Chapter 2 of the FEIS.

P-048-007

Mr. Peterson's proposal was considered. Please see the responses to his comments (P-029 and P-030).

P-048-008

The CRC project is subject to the same review and audit procedures as

- **Lack of Financial Statements and Accountability**

P-048-012

  - No financial statements for this project have been created
  - Data provided purporting to show 100% of all CRC expenditures does not reconcile to "Prolog" reports provided by the CRC project office.
  - Project office has refused and/or has been remiss in providing ***basic*** accounting data (contracts, invoices supporting payment, etc.)

- **Unclear Funding Sources**

P-048-013

  - The funds being used to pay for this single project could be better spent by "spreading the wealth" to various parts of the state where critical needs can be met
  - There is much uncertainty in the federal budget; will we even have funding for this project.
  - There is NO INFORMAITON Provided as to who is going to bear the cost of any costs in excess of $3.2B

P-048-014

At what point are the local leaders and decision makers going to say "Enough is Enough". I urge you to sit down with experts who are providing you with the warnings related to inefficiencies, and the anomalies associated with this project. I urge you to take a look at your funding. Is it prudent to spend all of our money in a single place, or might there be prudent alternatives to the current congestion situation here; yet enough dollars to spread to fix aging and failing areas along other trade routes in the States of Washington and Oregon?

Thank you for your consideration.

Best regards,
Tiffany

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other projects under the authority of the lead agencies. Additionally, Governors Kitzhaber and Gregoire, and Oregon and Washington legislators, have made it clear that they will review every element of this project and provide oversight and accountability. The governors and legislative leaders are discussing the scope of interim legislative oversight committees. At Governor Kitzhaber's request, the Oregon State Treasurer conducted an independent review of the CRC's financing plan and released a report in July 2011. CRC incorporated the treasurer's recommendation in Chapter 4 of the Final EIS.

The traffic projections which have been called into question are the same traffic projections which are used for all growth management and infrastructure sizing efforts in the Metro area. In fact, the project is required to base its traffic projections on these local plans and studies. The potential for a slower-than-projected rise in trips has been considered. Even if the projections are high, the facility is intended to serve mobility needs for 100 years. Therefore, even if it takes an additional five or ten years to reach the projected levels, the facility has still been appropriately sized.

P-048-009

The FEIS Finance Chapter (Chapter 4) provides a table (Exhibit 4.4-3, page 4-18) with revenue sources and amounts to cover costs expected for four scenarios (LPA med; LPA high; LPA with highway phasing med; LPA with highway phasing high). These scenarios range in total revenue needed from $3.2 - $3.8 billion.

Mr. Cortright has included costs in his estimates which are not appropriate. The capital (construction) costs for a project should not include maintenance and operations costs, though these too are discussed in the Finance Chapter. Mr. Cortright's estimates include costs to rebuild the Rose Quarter area of I-5, which is not part of the CRC project.

'Whenever you see a successful business, someone once made a courageous decision." - Peter Drucker

5

P-048-010

The FEIS compares light rail transit travel time in year 2030 to bus rapid transit travel times in year 2030 and finds that light rail will offer a quicker trip than bus rapid transit. It is not applicable to compare future travel times (light rail) to existing conditions (express buses). Congestion on I-5 will increase as more vehicles travel on the highway, therefore increasing the travel times of express buses, which use standard traffic lanes.

Light rail has been endorsed by every local Sponsoring Agency (Vancouver City Council, C-TRAN, RTC, Portland City Council, TriMet, and Metro), whose boards include elected leadership from throughout the area.

Annual light rail passenger trips crossing the I-5 bridge in 2030 are projected to be 6.1 million, with daily ridership around 18,700. The travel time for the morning commute by light rail between downtown Vancouver and Pioneer Square in downtown Portland will be approximately 34 minutes. Light rail would travel on a dedicated right-of-way, with more reliable travel times than auto drivers dealing with unpredictable road conditions, traffic congestion, and parking challenges.

The CRC project planning for light rail incorporates and supports the principles of Vancouver's City Center Vision Plan. Downtown Vancouver has seen recent growth in higher density mixed use projects from three to 12 stories in height. In addition, another 4,000 downtown condominiums are proposed or pending as part of new developments. The core of Vancouver has, along with many of the larger corridors such as Fourth Plain Blvd, medium to high density residential development and an urban mix of uses. Transit demand in these areas is quite high, and ridership will increase with the introduction of light rail.

As described in Chapter 3 (Section 3.1) of the DEIS, the operations and

maintenance (O&M) costs associated with light rail (LRT) would be less than those associated with bus rapid transit (BRT), largely because LRT operates on electricity while BRT is dependent on the volatile fuel market. LRT costs approximately $3.50, or 31%, less than BRT, per incremental rider when comparing both capital and operating costs.

Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on having a public vote.

P-048-011

Past financial performance is an important issue but is not relevant to the NEPA review process. The Record of Decision concludes the NEPA analysis. It indicates which alternative has been selected by the federal government, and allows for the continued design, eligibility for federal funding and permitting, and eventual construction of that alternative. The Locally Preferred Alternative is supported by local, regional, state, and federal agencies and has been selected following an exhaustive analysis and public involvement program.

The project takes the issues of financial management very seriously. Project staff have provided you with considerable records and reports and has responded to your inquiries. The project is currently developing new financial reporting mechanisms and has started providing monthly reports on the internet. The project will continue to work with the public to improve transparency and an understanding of the resources required for an undertaking of this scale.

The contracting process and any increases in contracting limits includes oversight by the project directors, WSDOT headquarters and legal counsel. The procurement process that resulted in selection of a General Engineering Consultant for the CRC project was open and competitive.

Contracting limits with the selected General Engineering Consultant (GEC) have been increased over time due to a variety of factors. WSDOT's contracting limit is $50 million to allow the agency to assess if work is being conducted well and provides the best value before increasing the contract limit. Funds cannot be committed to a contract or agreement before they have been allocated. At the beginning of the NEPA phase, when the consultant agreement was initially executed, there were many unknowns – including the number of alternatives to be studied. As a result, the entire scope of the project was unknown increasing the need for contract changes over time.

P-048-012

Please see the responses to your similar comments above.

P-048-013

As the only continuous north-south Interstate on the West Coast connecting the Canadian and Mexican borders, I-5 is vital to the local, regional, and national economy. The I-5 crossing also provides the primary transportation link between Vancouver and Portland, and the only direct connection between the downtown areas of these cities. As described in the DEIS, serious problems face this important crossing, including growing congestion, impaired freight movement, limited public transit options, high auto accident rates, substandard bicycle and pedestrian facilities, and vulnerability to failure in an earthquake. The fact that other important issues face our communities does not diminish the importance of addressing the problems plaguing the I-5 crossing.

CRC assumes funds allocated to other projects would remain dedicated to those projects, and anticipates needing to find new funds to finance the project. Funding for the project will come from a variety of sources including federal grants that would not be available to other transportation projects in the region, State of Oregon, State of Washington, and regional and local sources. In addition, it is assumed

that the replacement bridge will be tolled. Please refer to Chapter 4 of the FEIS for a description of the current plans for funding construction and operation of the LPA.

P-048-014

There has been considerable input from independent experts and the project has made changes based on that input, as discussed in Chapter 2 of the FEIS. Please see the responses to your comments above.

Hines, Maurice

From: Dan Coursey [ascente@comcast.net]
Sent: Sunday, October 23, 2011 9:35 PM
To: Columbia River Crossing
Subject: CRC Project Feedback -- NO ON LIGHT RAIL

Dear Sirs:

P-049-001 You are trying to shove Light Rail down the throats of Clark County, even though we have been exceedingly clear in telling you we don't want it here. Three times Clark county has voted this down and here you are trying to make and end-run around us by manipulating some of the local politicians.

Those politicians are going to pay a price at the voting booth for what they are doing. We have a long memory.

P-049-002 In the meantime, when Initiatiatve 1125 (tolling prohibitions) pass in Washington State you can be assured you were responsible. Also when Proposition-1 in Clark County, for increasing the tax rate for C-Tran bus transit fails miserably, you again can be assured you were responsible. We continue to petition our Federal representatives and State representatives to deny any funding for the CRC as long as it includes Light Rail. We don't like bullies in Clark county.

Sincerely,

Daniel and Margaret Coursey
4842 Dr Eldridge Drive
Washougal, Washington

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P-049-001

Light rail has been endorsed by every local Sponsoring Agency (Vancouver City Council, C-TRAN, RTC, Portland City Council, TriMet, and Metro), whose boards include elected leadership from throughout the area.

Annual light rail passenger trips crossing the I-5 bridge in 2030 are projected to be 6.1 million, with daily ridership around 18,700. The travel time for the morning commute by light rail between downtown Vancouver and Pioneer Square in downtown Portland will be approximately 34 minutes. Light rail would travel on a dedicated right-of-way, with more reliable travel times than auto drivers dealing with unpredictable road conditions, traffic congestion, and parking challenges.

The CRC project planning for light rail incorporates and supports the principles of the Vancouver's City Center Vision Plan. Downtown Vancouver has seen recent growth in higher density mixed use projects from three to 12 stories in height. In addition, another 4,000 downtown condominiums are proposed or pending as part of new developments. The core of Vancouver has, along with many of the larger corridors such as Fourth Plain Blvd, medium to high density residential development and an urban mix of uses. Transit demand in these areas is quite high, and ridership will increase with the introduction of light rail.

Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on having a public vote.

P-049-002

The tolling initiative failed and the Transit funding proposition passed.

Tom Dana
1501 N Hayden Island Dr #110
Portland, OR 97217
ThomasHDana@gmail.com
503-954-9217

October 22, 2011

Heather Wills
Columbia River Crossing
700 Washington Street, Suite 300
Vancouver, WA 98660

re: FEIS Comments

Greetings,

P-050-001

To begin I want to express my support for LPA Option A. A new bridge is necessary to alleviate the traffic congestion of the current I-5 bridge.

Currently life on the Island is very relaxing and easy going with a small town feel to it. Except for the traffic rush during the November/December shopping season the Island is easy to get around. But this will change starting with the construction of the new bridge.

The loss of Safeway, our full service grocery store on the Island is not being fully replaced by the new Target store which will only have partial fresh meats, fruits, and vegetables. And at present it doesn't look like the mall will lease to another full service grocery store. We are losing our only gas station. We are losing our car wash. We are losing one of our two banks. We are losing most of our low cost restaurants. The central part of the Island will change from easy driving with few traffic lights to stop and go driving with traffic lights and restricted turn lanes. The Island will be split in two by a massive interchange of on-ramps and off-ramps for both the Island and the Marine Drive interchange. The Hayden Island Plan's area for local commercial is being covered by storm water runoff ponds. The Manufactured Home Community is an Environmental Justice Community and this is not recognized in the FEIS. The Island will endure 5 to 10 years of construction and disruption to our community and the ensuing noise, difficulty getting around, dust pollution, air pollution, and loss of businesses will take its toll on our community.

With varying degrees of satisfaction most of these losses are touched upon in the FEIS, but what is not dealt with at all is the gestalt of the whole devastating package put together. And there is no mitigation specified for this whole package.

To this end a community enhancement fund would be a first step towards mitigating the whole package. One possibility is to have a community center for the Island which during construction would provide information about road closers and provide assistance to the elderly and mobility challenged. One suggestion from the transit consultant Greg Baldwin was to have some of the community enhancements completed at the start of construction so that we could feel something of the project completion ahead of time. A possibility for this would be a pocket park with a construction viewing area so we could watch the construction in progress. Also some of the retail around the transit station could be arranged at the start of construction. A possibility here would

P-050-001

In the last three years the CRC project team, the Project Sponsors Council, and CRC advisory groups have focused on incorporating a wide range of community enhancements into the project. The project has looked for ways to leverage the highway and transit investments into additional improvements for project neighbors and local communities. These improvements are beyond the benefits identified as the project's purpose and need. These tangible improvements include new local roads and improved local flow and connections for Hayden Island residents; better bike and pedestrian access to the improved facilities; new bike and pedestrian trails; and a separate bridge for local auto access from North Portland to Hayden Island. We know there is more to be done. The CRC remains committed to aggressively maximizing and leveraging resources to bring additional benefits and improvements to our community.

Two options have been identified for further exploration; both include a financial set-aside of a specific amount dedicated to a specific purpose. One approach is a project-specific community enhancement fund. There is some history with such an approach - the Delta Park 1-5 widening project (2006) and Metro's solid waste program (1991) are two examples. The other approach is a different concept, a regional fund established by the state to benefit the neighborhoods and communities in close proximity to 1-5 and the CRC project. Both approaches have been successfully implemented in the Portland region and will help inform this effort. We need to be clear about both of these approaches - neither will be easy. Both approaches have limitations and legal restrictions associated with anticipated funding sources. Both will require legislative support. Both will likely need enabling legislation and both will require funding.

P-050-001

be food carts which would serve both the construction personnel as well as the local residents and Island visitors.

A community enhancement fund which does as much as is possible at the start of construction will go a long way towards easing the 5 to 10 year negative impact of the project.

Thank you

Tom Dana

Hines, Maurice

From: mw.durrell@comcast.net
Sent: Monday, October 24, 2011 10:19 PM
To: Columbia River Crossing
Subject: CRC - Environmental impact concern

P-051-001 My concern relates to the impact on environment by spending billions on the CRC with such a low return.

P-051-002 I-5 traffic has not increased as projected.

P-051-003 Light rail is light capacity and does little to reduce traffic.

P-051-004 The costs and impact of CRC on businesses are immense.

P-051-005 This project will spend billions of borrowed money and disrupt the environment for no good reason.

Mark Durrell
Camas, WA

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P-051-001

As the only continuous north-south Interstate on the West Coast connecting the Canadian and Mexican borders, I-5 is vital to the local, regional, and national economy. The I-5 crossing also provides the primary transportation link between Vancouver and Portland, and the only direct connection between the downtown areas of these cities. As described in the DEIS, serious problems face this important crossing, including growing congestion, impaired freight movement, limited public transit options, high auto accident rates, substandard bicycle and pedestrian facilities, and vulnerability to failure in an earthquake. The fact that other important issues face our communities does not diminish the importance of addressing the problems plaguing the I-5 crossing.

CRC assumes funds allocated to other projects would remain dedicated to those projects, and anticipates needing to find new funds to finance the project. Funding for the project will come from a variety of sources including federal grants that would not be available to other transportation projects in the region, State of Oregon, State of Washington, and regional and local sources. In addition, it is assumed that the replacement bridge will be tolled. Please refer to Chapter 4 of the FEIS for a description of the current plans for funding construction and operation of the LPA.

P-051-002

Traffic forecasts reported in the DEIS and used to inform decisions on a locally preferred alternative were derived from adopted regional employment and population forecasts and state-of-the-art modeling and evaluation conducted by Metro, RTC and the project team. These traffic forecasts were reviewed by all project sponsor agencies as well as FTA and FHWA. In addition, an independent panel of traffic modeling experts was convened in October 2008 to review the modeling methods and findings. These experts concluded that the project's approach to estimating future travel demand was reasonable and that it relied on

accepted practices employed in metropolitan regions throughout the country. These findings are summarized in the “Columbia River Crossing Travel Demand Model Review Report” (November 25, 2008). This independent review confirmed the approach CRC modeling used to address multiple variables that can affect travel demand, including gasoline prices, tolling, travel demand measures, and induced development.

P-051-003

Light rail has been endorsed by every local Sponsoring Agency (Vancouver City Council, C-TRAN, RTC, Portland City Council, TriMet, and Metro), whose boards include elected officials from throughout the area.

Annual light rail passenger trips crossing the I-5 bridge in 2030 are projected to be 6.1 million, with daily ridership around 18,700. The travel time for the morning commute by light rail between downtown Vancouver and Pioneer Square in downtown Portland will be approximately 34 minutes. Light rail would travel on a dedicated right-of-way, with more reliable travel times than auto drivers dealing with unpredictable road conditions, traffic congestion, and parking challenges.

The CRC project planning for light rail incorporates and supports the principles of Vancouver's City Center Vision Plan. Downtown Vancouver has seen recent growth in higher density mixed use projects from three to 12 stories in height. In addition, another 4,000 downtown condominiums are proposed or pending as part of new developments. The core of Vancouver has, along with many of the larger corridors such as Fourth Plain Blvd, medium to high density residential development and an urban mix of uses. Transit demand in these areas is quite high, and ridership will increase with the introduction of light rail.

Long-term operation and maintenance of the new light rail line will be

funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on having a public vote.

P-051-004

The impacts of the proposed project on businesses are discussed in Section 3.4 of the FEIS. While there will be commercial displacements and other impacts, it is presumed that the investment in infrastructure will directly benefit the local and regional economy in many ways.

P-051-005

The FEIS discusses the reasons for the proposed action (Chapter 1) and discusses the environmental impacts (Chapter 3), which include adverse as well as beneficial impacts.

From: John Eichler [mailto:Eichler4@comcast.net]
Sent: Friday, September 16, 2011 8:29 AM
To: Columbia River Crossing
Subject: Question on design of bridge

P-052-001 Is it not possible to make this a 2 deck bridge doubling the lanes heading in each direction? I do realize this would require a significant build-out of the freeways, and create an issue with merging lanes eventually, but has it been looked at?

P-052-001

The project has evaluated alternatives with up to, but not more than, 6 lanes in each direction across the bridge, and the selected alternative would build 5 lanes in each direction. The selected alternative also has a double deck bridge (two parallel structures) with highway lanes on the 2 top decks and light rail transit and a pedestrian and bicycle path underneath. The project has looked at stacked highway lanes, as Mr. Eichler suggested. However, aviation and navigation constraints would require the facility to land further from the Columbia River, perhaps missing Hayden Island, and would add significant costs.

Hines, Maurice

From: Gerald Fox [gdfox@q.com]
Sent: Thursday, October 20, 2011 10:19 AM
To: Columbia River Crossing
Subject: Comment on FEIS

Categories: Red Category

Greetings,

P-053-001 I'm really concerned that the present CRC proposal is wrong, and a huge waste of money we don't have.

The project claims it will alleviate congestion, which is difficult to understand. If you ever use the Portland freeway system you will know that there are numerous congestion points regionwide. If the CRC enables more traffic to enter the system, it will aggravate travel for everyone in the region. Congestion, air pollution, greenhouse gases will all soar. The FEIS ignores this, by limiting study to arbitrarily defined "project limits".

P-053-002 If, on the other hand, the CRC limits traffic (by tolls/congestion pricing) to existing levels or less, to maintain free flow on I-5, then why do we need to spend $4.0 billion on a new bridge ?

P-053-003 A supplementary bridge could provide relief to the existing bridge at a fraction of the cost.

I think we should stop the present waste of tax money, and devise a solution that is cost effective, and consistent with the real needs of the 21st century.

Gerald Fox

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P-053-001

The proposed new add/drop lanes (i.e., lanes that connect two or more interchanges) are used to alleviate safety issues associated with the closely spaced interchanges in the project area and are not designed to increase capacity generally on I-5. 68 to 75% of I-5 traffic enters and/or exits I-5 within the CRC project area, and these add/drop lanes provide space for this traffic to do so without disrupting cars and trucks traveling to destinations further north and south of the project area. The project does not propose to add lanes north or south of the project limits.

The DEIS evaluation found that the project, with a toll and light rail, would actually reduce the total daily volume of traffic using the I-5 and I-205 river crossings by approximately 3%. The FEIS analysis of the project has been updated to include an evaluation of how the CRC project would affect Vehicle Miles Traveled (VMT) (see Chapter 3, Section 3.1). Rather than inducing sprawl, the CRC project will likely reinforce the region's goals of concentrating development in regional centers, reinforcing existing corridors, and promoting transit and pedestrian friendly development and development patterns. In 2010, Metro ran the MetroScope model (an integrated land use and transportation model) to forecast growth associated with transportation improvements of a 12-lane river crossing and light rail to Clark College. The model showed only minimal changes in employment location and housing demand compared to the No-Build. For more information see FEIS Chapter 3, Section 3.4.

Though there are numerous congested areas in the region, this area has been identified by many agencies as requiring a comprehensive solution.

P-053-002

While tolls and the extension of high capacity transit will reduce the demand for the Interstate river crossing, demand and throughput on the bridge will certainly increase. Alternatives which did not replace the

Hines, Maurice

From: Gerald Fox [gdfox@q.com]
Sent: Thursday, October 20, 2011 10:31 AM
To: Columbia River Crossing
Subject: CRC

Categories: Red Category

Hi,

P-053-004 I'm a retired transportation engineer, and I've been following the CRC project with a growing sense of dismay and foreboding. Seems it's all about building a big new bridge, regardless of cost, and not about solving the problems identified in the Purpose and Need in a manner appropriate to our region, and the transportation needs of the 21st century.

We already have 14 freeway lanes across the Columbia River. The CRC project would give us 18 lanes, at a cost of $4.0 billion. The project never considered an alternative emphasizing Alternative Transportation, which is the main goal of transportation planning everywhere else in the region.

P-053-005 The committees selecting alternatives were stacked to support the "Big Bridge" cause, and dissent was ignored or suppressed. Some staff were reportedly threatened !!

P-053-006 The existing bridge has already had one seismic retrofit, and is in better condition than many other highway bridges. What a waste of public money to tear it down when a supplementary bridge could relieve congestion at far less cost, and far fewer negative consequences.

Gerald Fox

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bridge and increase capacity fail to satisfy the adopted Purpose and Need for the project.

Following the selection of the LPA in July of 2008, the CRC Project Sponsors Council (PSC) was developed to provide recommendations to the project on a variety of issues, including the number of add/drop lanes over the river crossing. Over the course of several months, PSC was provided with operational characteristics and potential environmental impacts of 8-, 10-, and 12-lane options. Technical evaluation criteria included, but were not limited to, traffic safety, congestion, traffic diversion onto local streets and I-205, regional vehicle miles travelled, transit ridership, regional economic impact, effects to neighborhoods and protected species and habitats. In additionto the technical information, PSC received input from CRC advisory groups and reviewed public comment submitted to the project and obtained during two public Q&A sessions in January 2009 regarding the number of lanes decision, as well as hearings conducted by Portland City Council and by Metro Council. In August 2010, the PSC voted unanimously to recommend that the replacement bridges be constructed with 10 lanes and full shoulders. For more information regarding the number of lanes decision making process, see Chapter 2 (Section 2.7) of the FEIS.

P-053-003

A supplemental bridge was studied in the EIS. See Chapter 2 of the FEIS, as well as the Record of Decision, for a discussion of why a supplemental bridge is not part of the preferred alternative.

P-053-004

Many ideas involving low investment in highway alternatives were considered during the early evaluation of alternatives. See Chapter 2 of the FEIS. In the DEIS and FEIS, Alternatives 4 and 5 put much more emphasis on high capacity transit and TSM/TDM and much less on highway improvements. These alternatives had only one new auxiliary

Hines, Maurice

From: Gerald Fox [gdfox@q.com]
Sent: Thursday, October 20, 2011 10:37 AM
To: Columbia River Crossing
Subject: CRC

Categories: Red Category

P-053-007

The CRC project makes much of the "Trade Corridor" from Canada to Mexico, on which the CRC is supposedly a barrier and embarrassment. Except that it isn't. Through traffic on I-5 is routed onto I 205 around Portland, because I-5 through Portland has numerous choke points. The CRC is only one of them, and the source of only a small percentage of the daily freeway delays in Portland. If the CRC is built, through traffic will still be routed round I-205, because there will still be no more capacity at all the other choke points, regardless of how many lanes there are on the $4.0 billllion bridge.

I haven't seen this disclosed anyewhere.

Gerald Fox

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lane in each direction across the river, had double the HCT service levels, and had higher highway tolls. Modeling indicated significantly worse congestion with these alternatives and only slightly better transit ridership. Transit cost effectiveness was much poorer for these alternatives than for the other build alternatives in the DEIS.

P-053-005

Multiple methods have been used to engage the public so as to address the needs of a wide variety of people in the project decision-making process. Public feedback has helped guide the outreach effort. Examples include workshops with facilitated small-group discussions, open houses where participants can talk one-on-one with staff, public hearings, presentations and discussions at community and neighborhood-sponsored meetings (often at the group's request), and advisory group meetings where CRC seeks recommendations from a citizen committee. These events and meetings have taken place at a variety of locations, days of the week, and times of the day to meet the needs of the entire community. For more information on the project's public outreach, please see Appendix B (Public Involvement) of the FEIS.

P-053-006

The supplemental river crossing would not substantially improve congestion over No-Build, would maintain some substandard and unsafe design features, and would not be substantially cheaper to construct than a replacement river crossing, as originally believed. See the discussion of seismic safety issues of the existing bridges in the following reports available through CRC: Columbia River Crossing, Panel Assessment of the Interstate Bridges Seismic Vulnerabilities, December 2006; DGES Inc., ODOT - Interstate 5 Bridges over Columbia River Seismic Evaluation of Lift Span Unit, December 1994; DGES Inc., ODOT - Interstate 5 Bridges over Columbia River Seismic Retrofit of Truss Span Pier Foundations Conceptual Design and

Hines, Maurice

From: Gerald Fox [gdfox@q.com]
Sent: Thursday, October 20, 2011 10:43 AM
To: Columbia River Crossing
Subject: CRC

Categories: Red Category

P-053-008

The CRC project claims it will cut congestion, which will reach 15 hours a day if we don't build the Big Bridge.. Which is odd, because there is nowhere for any more peak hour traffic to go. According to Metro, Light Rail is supposed to carry 37% of peak hour trips across the bridge by 2030. And I-5 will presumeably carry pretty much what it carries today, at least beyond Columbia Boulevard.

So why not just build a supplementary bridge to relieve I-5, to carry local traffic, transit, and bikes at far less cost, and with far less environmental damage?

Gerald Fox

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Estimate, February 1995; DGES Inc., ODOT - Interstate 5 Bridges over Columbia River Seismic Retrofit of Truss Span Bearings Conceptual Design and Estimate, March 1995.

P-053-007

The Vancouver-Portland region is a trade hub, acting as a gateway and distribution center for domestic and international markets. The region has become a trade hub, in large part, because of its direct access to the freeway system, navigable rivers, rail lines, and international air shipping. The region's continued competitiveness as a trade hub is dependent on the ability to efficiently move freight on and between these transportation facilities. Though I-205 is a convenient, cost-effective route for some freight trips, it cannot replace the role of I-5 as a freight route. For many freight trips, I-205 would be out of direction, adding to travel time and shipping costs. In addition, trucks will travel on I-5 because it is shorter and faster than I-205. In 2005, the I-5 Interstate Bridge carried approximately 3,240 more trucks per day or 42 percent more than the I-205 Glenn Jackson Bridge. Trucks try to avoid congestion and travel during uncongested periods, and because the travel distance on I-5 from junction to junction is only 19.3 miles compared to 25.5 miles on I-205, trucks will travel on I-5. Increased shipping costs can have a significant impact on the overall costs of doing business in our region, making us less competitive and threatening our status as a trade hub.

P-053-008

By 2030, the region's population is expected to increase by one million people. This increase will result in more people needing to travel between home, work, school, recreation, etc. In 2005, 135,000 vehicles crossed the Columbia River on the Interstate Bridge each weekday, which led to 4-6 hours of congestion. By 2030, 184,000 vehicles are predicted to cross the river each weekday, which would lead to 15 hours of daily congestion if no action is taken.

Hines, Maurice

From: Gerald Fox [gdfox@q.com]
Sent: Thursday, October 20, 2011 10:52 AM
To: Columbia River Crossing
Subject: CRC

Categories: Red Category

P-053-009

The CRC is said to reduce air pollution, greenhouses gases, and congestion, compared to the **No Build** alternative.

Unfortunately for the region and the local taxpayers, the Project manipulated the process to avoid studying an alternative based on Alternative Transportation. For instance of the 5 alternatives studied in exhaustive detail, two were simply using bus transit instead of rail for the purpose of distracting study participants, and claiming that surely 5 alternatives were enough. Of course an Alternative Transportation alternative would have accomplished the project "Purpose and Need" with less impacts, and a fraction of the cost, undermining the DOTs desire to build a really big bridge!

Time to stop this nonsense, and fix the disastrous proposals now before us.

Gerald Fox

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Congestion occurs when vehicle demand is greater than a transportation system's capacity. It results in slower speeds and increased travel times. CRC defines congestion as vehicles traveling less than 30 mph. The Columbia River Crossing project uses information gathered from Metro's nationally-recognized travel demand models to determine the project's effect on congestion. These models predict trip frequency, types or modes of transportation, destination, and time of day. Transportation planners use these models to analyze the effects of such factors as increased population and employment, transportation improvements, and new developments on the transportation system.

Based on the Metro model's past ability to predict transportation effects, the CRC project is confident in the data received from Metro and uses it to determine what impact the project will have on congestion. The improvements proposed by the project to the highway and seven interchanges will help better accommodate increased future vehicle traffic. New auxiliary lanes and longer on/off ramps will allow safer and more efficient merging and weaving to enter or exit the freeway. Narrow lanes and shoulders will be widened to current standards. Shoulders will be added where they are currently missing. All of these changes will improve the flow of traffic in the bottleneck area of the Interstate Bridge.

Issues related to a supplemental bridge are addressed above.

P-053-009

See response to the comment above regarding the problems with the proposals that relied mostly or solely on alternative transportation to address the multiple transportation needs in the project area.

Hines, Maurice

From: Gerald Fox [gdfox@q.com]
Sent: Thursday, October 20, 2011 11:03 AM
To: Columbia River Crossing
Subject: CRC

Categories: Red Category

P-053-010 The CRC is supposed to generate thousands of much-needed jobs. Originally 20,000 jobs were claimed, but when that was challenged, the number became 2,000. And that doesn't count the hundreds of jobs lost because the project will destroy numerous businesses in Vancouver and Hayden Island. And that assumes the project will actually survive legal challenges, lack of money, and eventually the ballot box, and get built.

P-053-011 Many well informed critics have advocated an alternative based on Alternative Transportation principles. This will of course generate many jobs, as well as reduce the jobs lost through business destruction. And because such an approach will include several components, such as an improved railroad bridge, and a supplementary street bridge, it will likely come to construction sooner.

And because the Alternative Transportation alternative will cost less, it won't suck up all the available descretionary funds (and the jobs they could generate) elsewhere in the states of Oregon and Washington.

Let's get past this inappropriate project, and get on with something the will relieve congestion, and actually get built.

Gerald Fox

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P-053-010

It is fairly standard to express projected employment from capital investments in terms of "job years". The early CRC estimate that it would generate about 20,000 jobs (job years) has not changed. What has changed is that the estimate has been broken down into the number of estimated full time employees per year (jobs per year) rather than the total number of job years for the full duration of project construction.

P-053-011

See responses above regarding alternative transportation proposals.

Hines, Maurice

From: Dennis Ghormley [dennis.ghormley@comcast.net]
Sent: Monday, October 24, 2011 5:28 PM
To: Columbia River Crossing
Subject: Fiscal Accountability

P-054-001

There should be a transparency in the fiscal accountability on this CRC and any public project. From what I have been able to determine, transparency is no where to be found!

Dennis Ghormley

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P-054-001

The project is willing to meet and discuss detailed questions. The project can also send detailed financial information if requested.

Hines, Maurice

From: halverbk@comcast.net
Sent: Sunday, October 23, 2011 8:58 PM
To: Columbia River Crossing
Subject: Comment from CRC Submit Comments Page

From: Brad Halverson
E-Mail: halverbk@comcast.net
Comment or Question:

P-055-001

Thank you for completing the EIS! I endorse the modifications that have occurred since the DEIS was published. I do hope that if construction of some elements is deferred that their priority will be reassessed at that time so the problems left by their deferral will be dealt with in a logical progression.

Sincerely,

Brad Halverson
CRC Task Force member

P-055-001

If some elements of the project need to be phased, those decisions will include consideration of the timing of benefits and the effects that would have.

Hines, Maurice

From: Daniel Hoyer [lunch.rider@gmail.com]
Sent: Monday, October 24, 2011 4:48 PM
To: Columbia River Crossing
Subject: CRC

P-056-001

I want to add my voice to the people commenting on this project.
The EIS is flawed
The basic premis of the need for a new and larger bridge is flawed
Just build a simple bridge to Jansen Beach for non freeway traffic and TOLL the existing bridge

Daniel Hoyer

Portland

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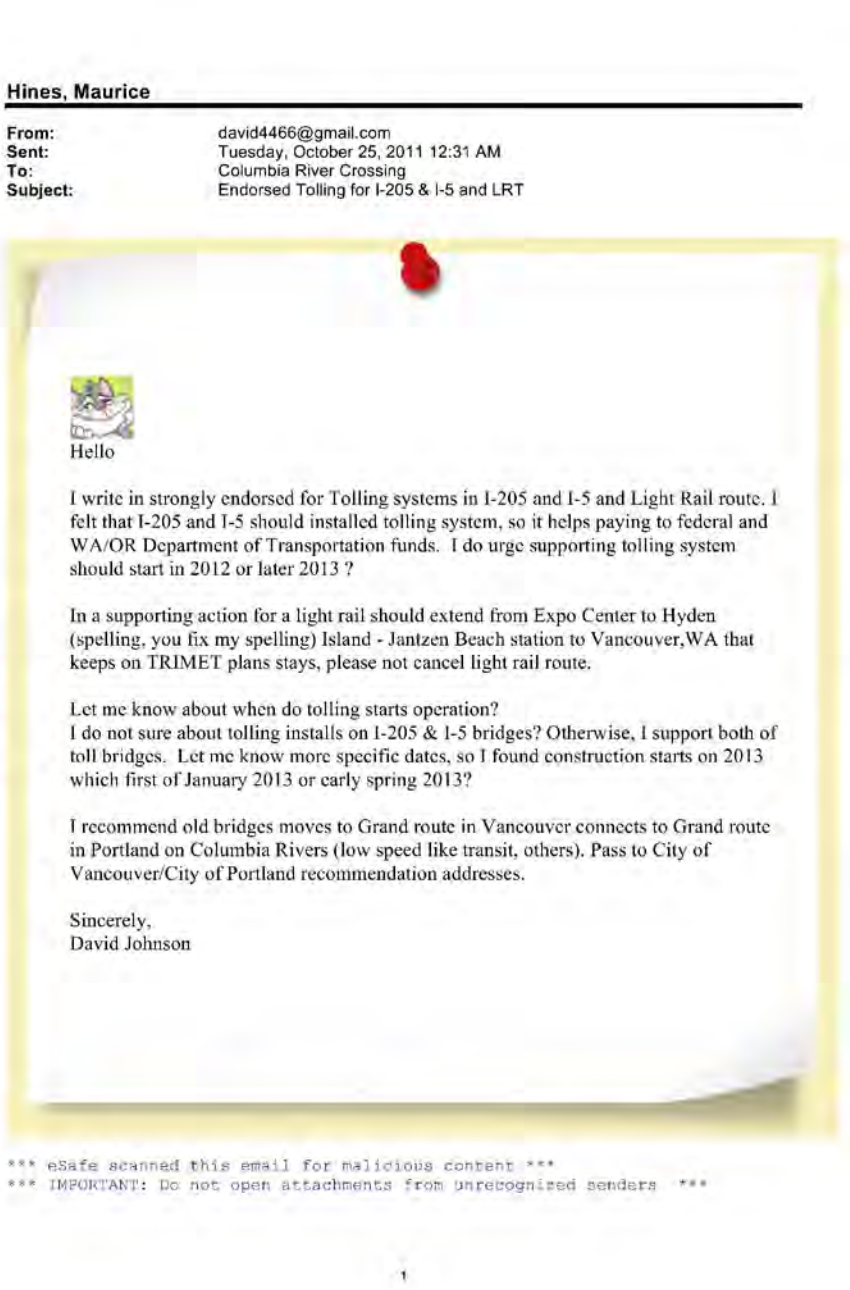
P-056-001

The transportation needs that the project addresses are described in Chapter 1 and further explained in Section 3.1 of the FEIS. The idea Mr. Hoyer mention was considered during CRC project evaluation and screening, as summarized in Chapter 2 of the FEIS.



Hines, Maurice

From: david4466@gmail.com
Sent: Tuesday, October 25, 2011 12:31 AM
To: Columbia River Crossing
Subject: Endorsed Tolling for I-205 & I-5 and LRT

Hello

P-057-001

I write in strongly endorsed for Tolling systems in I-205 and I-5 and Light Rail route. I felt that I-205 and I-5 should installed tolling system, so it helps paying to federal and WA/OR Department of Transportation funds. I do urge supporting tolling system should start in 2012 or later 2013 ?

P-057-002

In a supporting action for a light rail should extend from Expo Center to Hyden (spelling, you fix my spelling) Island - Jantzen Beach station to Vancouver,WA that keeps on TRIMET plans stays, please not cancel light rail route.

P-057-003

Let me know about when do tolling starts operation?
I do not sure about tolling installs on I-205 & I-5 bridges? Otherwise, I support both of toll bridges. Let me know more specific dates, so I found construction starts on 2013 which first of January 2013 or early spring 2013?

P-057-004

I recommend old bridges moves to Grand route in Vancouver connects to Grand route in Portland on Columbia Rivers (low speed like transit, others). Pass to City of Vancouver/City of Portland recommendation addresses.

Sincerely,
David Johnson

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P-057-001

Tolling I-205 is not part of this project, but could be implemented separately. With few exceptions, federal statutes do not permit tolling of an existing interstate highway without associated improvements. FHWA does have pilot programs that allow state departments of transportation to apply for approval to toll a facility.

Some form of tolling prior to constructing CRC may be implemented. The ultimate decision on any tolling options will be made by both the Washington and Oregon Transportation Commissions.

P-057-002

The LPA includes light rail from Expo Center to a terminus near Clark College in Vancouver, with a station on Hayden Island.

P-057-003

Regarding tolling I-205, please see P-057-001.

Modeling has indicated that tolling I-5 without making the improvements that are part of the CRC project would not meet the project's Purpose and Need. This does not mean that some form of tolling prior to constructing CRC couldn't be implemented. The ultimate decision on any tolling options will be made by both the Washington and Oregon Transportation Commissions.

P-057-004

Construction is expected to start in late 2013. See Chapter 2 of the FEIS for additional discussion of the expected construction schedule. The project will actively seek ways to reuse the existing bridges. However, because they include a lift span which impedes river navigation, they may not be used nearby. A separate analysis will start after the Record

of Decision is published, and there will be many alternate uses considered for the bridge.

-----Original Message-----
From: lesliejerryg@aol.com [mailto:lesliejerryg@aol.com]
Sent: Monday, September 26, 2011 9:46 AM
To: Columbia River Crossing
Subject: Comment from CRC Submit Comments Page

From: Jerry Leslie
E-Mail: lesliejerryg@aol.com
Comment or Question:

P-058-001 What is being done about the I-5 near the Rose Quarter. Untill this bottleneck is undone there should'nt be an improvement to make a bigger PROBLEM.

P-058-001

The Oregon Department of Transportation (ODOT) completed Phase I construction of the I-5 Delta Park widening project in fall 2010. Phase I of the project involved widening I-5 and lengthening the entrance and exit ramps at Victory Boulevard and Columbia Boulevard. Phase II involves improving local streets and will begin when funding is secured. Phase I of the Delta Park project widened the current 2-lane segment of southbound I-5 to 3 lanes. There are currently no immediate plans to widen I-5 south of Delta Park. Neither the CRC project nor the Delta Park projects are intended to address the southbound traffic congestion that currently exists near the I-5/I-405 split. However, traffic analyses show the congestion at the split will not be worsened because of the Columbia River Crossing project. The main reason is that fewer cars are expected to cross the river with a project in 2030 than without a project. This is due to the provision of improved transit service and tolling.

Beyond the CRC and Delta Park projects, the I-5 Transportation and Trade Partnership Final Strategic Plan recommended a comprehensive list of modal actions relating to: additional transit capacity and service; additional rail capacity; land use and land use accord; transportation demand/system management; environmental justice; additional elements and strategies (such as new river crossings); and financing. RTC and Metro are tasked with initiating recommendations as part of their regional transportation planning role. Examples of current efforts include RTC's evaluation of future high-capacity transit in Clark County, and evaluation of needs for future river crossings. Regional planners have investigated solutions to existing bottlenecks at the I-5 connections with I-405 and I-84. ODOT is responsible for conducting ongoing studies to identify other congestion problems on I-5 in Oregon that may need to be addressed in the future.

Hines, Maurice

From: Doug Mabry [doug@mabry.org]
Sent: Monday, October 24, 2011 9:48 PM
To: Columbia River Crossing
Subject: feedback

P-059-001 How will businesses be re-imbursed for lost revenue during the building project?

1

P-059-001

Businesses will not be reimbursed for lost revenues, but any business that would be directly displaced would be provided with financial and other relocation assistance. The project will also work with businesses located near construction to support their continued viability. This is discussed in the FEIS, Section 3.4.

Hines, Maurice

From: Doug Mabry [doug@mabry.org]
Sent: Monday, October 24, 2011 9:50 PM
To: Columbia River Crossing
Subject: feedback

P-059-002 What is the impact of repairing the existing structure so it will last for another 50 years?

1

P-059-002

As documented in the Panel Assessment of Interstate Bridges Seismic Vulnerabilities Technical Report (2006), it was determined necessary for any CRC project alternatives that reused the existing I-5 bridges to also seismically retrofit those bridges. The DEIS analyzed a Supplemental River Crossing as a component of two out of the five alternatives studied.

A Supplemental River Crossing, which would retain and seismically retrofit the existing bridges for northbound traffic and add one new bridge to the west for southbound traffic, was not chosen as a part of the Locally Preferred Alternative by the local sponsor agencies. This decision was informed by the DEIS, which found, among other things, that the Supplemental River Crossing would not substantially improve congestion over No-Build, would maintain some substandard and unsafe design features, and would not be substantially cheaper to construct than a replacement river crossing, as originally believed. In addition, the Supplemental crossing could worsen marine navigation by retaining the existing piers, and adding a new set of structures in the water with the new bridge. The US Coast Guard informed the project in a letter dated January 26, 2006, that “retention of one of the existing bridges for travel off Interstate 5 would at best maintain the same degree of difficulty to vessels, especially downbound tows. For that reason I would also not recommend such a plan…”

Although the Supplemental River Crossing would improve the seismic safety of the existing bridges, these findings indicate that it did not meet the project's Purpose and Need as effectively as the Replacement River Crossing. A supplemental bridge that only includes improvements for transit and/or bicycles and pedestrians also does not meet the CRC project's Purpose and Need. As described in Chapter 1 of the DEIS, the project's Purpose and Need "was developed by relying on previous

planning studies, solicitation of public input, and coordination with stakeholder groups."

Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 7:44 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 1

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem
To: feedback@columbiarivercrossing.org
Unanswered excessive cost issue

P-060-001

Please do not approve this project. Here is one fundamental reason why it should be rejected:

In February John **Mica**, chairman of the House **Transportation** and Infrastructure Committee, at a "listening session" in Vancouver Washington. During that meeting, he held up a graph that David Madore passed to him that showed the cost of the CRC Light Rail project as extreme compared to the other recent bridge projects in the country. He asked everyone in the room why this project was off the chart in extreme expense compared to the others. He that it appeared that something was fundamentally wrong with this project that question needed to be answered.

After Mr. Mica returned to Washington, he then praised the project as though he had forgotten the red flag that indicted something was very wrong with the cost. There is no record of the excessive cost being addressed or justified. That is a problem. Such a fundamental red flag should have caused a pause in this project and a clear investigation conducted to determine the source of the anomaly. The NEPA process was not followed because other more practical less costly alternatives were not considered to resolve the prohibitively high cost.

It would be irresponsible to move forward with this project with such a glaring red flag.

Please acknowledge receipt of this letter to:

David Madore
david.m@usdigital
1400 NE 136 Ave
Vancouver, WA 98684
cell: 360-601-3056

P-060-001

Although project expenditures are appropriate for a project of this type - complex, large, and inter-agency - the Project Directors and the leadership of Sponsoring Agencies are mindful of the project's costs, and are working to both reduce costs and find the necessary funding. Based on this comment, it appears that concerns Representative Mica may have had regarding the project were resolved. However, as Representative Mica has not submitted a comment on the FEIS, the project cannot make any definitive conclusions as to his perspective on the project.

Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 8:19 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 2
Attachments: CRC_Financial_Analysis_by_Impresa_Inc.pdf

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem 2
To: feedback@columbiarivercrossing.org
ODOT statements contradict fundamental CRC statements

P-061-001

Please do not approve this project. Here are several fundamental reasons why it should be rejected:

This project is based on a false information. The bridge that this project is to replace has been fallaciously deemed as unsafe when ODOT documentation declares the bridge to be in healthy condition and able to continue serving the public for another 60 years. During the last major upgrade to the existing I-5 Columbia River Bridge, ODOT published the following statements on their official website for the public:

"The two bridges have a full-time crew on deck to keep the aging structures in top operating condition. Only three other Oregon bridges -- all in Astoria -- have a designated maintenance crew.

This personalized care, combined with large maintenance projects, has kept the spans healthy and free of weight restrictions. With ongoing preservation, the bridges can serve the public for another 60 years.

The Interstate Bridges continue to be a vital link between Portland and Vancouver and complement any long-range plans to manage and improve transportation in the I-5 corridor between the two states.

Maintenance and repairs keep the bridges healthy and free of weight restrictions. Some recent bridge preservation efforts have included:
• 1987-90 - Replacement of the lift-cables, drums, expansion joints and deck pavement overlay ($3 million)
• 1995 - Replacement of diesel generator and lift-engine ($120,000)
• 1997 - Replacement of an axle-like steel trunnion, counterweight sheaves and steel ropes ($3 million)
• 1999-2001 - Painting, sub-deck and steel rehabilitation on the northbound bridge ($20 million)
The current project will upgrade and replace significant portions of the electrical systems within the two spans. Transportation funding experts estimate a replacement bridge would cost between $500 million and $1 billion."

P-061-001

The safety needs for these bridges are in relation to traffic safety and seismic safety, as described in Section 1.3.2 of the FEIS. Also see the discussion of seismic safety on page 6-22 of the FEIS. The safety aspect Mr. Madore is referring to is structural integrity. The bridges have adequate structural integrity and are not in danger of any immediate failure, except in the case of a major seismic event.

The estimated cost for the replacement bridges over the Columbia River is within the range noted. The total CRC cost includes much more than the two Columbia River bridges, as described in Chapter 4 of the FEIS.

P-061-001

Notice also that ODOT stated that "Transportation funding experts estimate a replacement bridge would cost between $500 million and $1 billion." Yet the CRC Light Rail project is now stated to cost 4 to 7 times the cost that the experts stated at the time. Prices of materials and services have not grown to explain the inflated costs that the CRC now estimates. Note that the Cortright Report (attached) shows the actual cost of the CRC plan to be $8.7 billion with finance charges. A copy of that report is attached. It shows numerous problems that have not been addressed by the NEPA process.

It would be irresponsible to move forward with this project with such a glaring red flags.

Please acknowledge receipt of this letter to:

David Madore
david.m@usdigital
1400 NE 136 Ave
Vancouver, WA 98684
cell: 360-601-3056

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Plaid Pantries, Inc. - 10025 SW Allen Blvd. - Beaverton, Oregon 97005 - Telephone: 503.646.4246 - Facsimile: 503.646.3071

MEMORANDUM

TO: Senator Peter Courtney, President of the Senate
Senator Richard Devlin, Senate Majority Leader
Senator Ted Ferrioli, Senate Minority Leader
Representative Dave Hunt, Speaker of the House
Representative Mary Nolan, House Majority Leader
Representative Bruce Hanna, House Minority Leader
Members Oregon Legislative Assembly

COPY: Mr. Ted Wheeler, Oregon State Treasurer
Columbia River Crossing Project Sponsors Council

FROM: Chris Girard, President & CEO, Plaid Pantries, Inc.

DATE: October 4, 2010

RE: Columbia River Crossing

Ladies & Gentlemen:

P-061-001 Enclosed is a professional analysis of the economics of the current proposed Columbia River Crossing Bridge Project. I commissioned this study, and as a small business operator, I am respectfully requesting that you invest the time to read and understand the information in this analysis. It is not just about the proposed Columbia River Crossing (CRC) itself, but the likely negative impacts for Oregon's overall finances, taxpayers, and businesses, especially small business.

The report documents the unfortunate fact that the proposed CRC project's real costs are more than double the widely-accepted figure of $3.6 billion. In reality the current design for the project will cost in the range of $8 billion to $10 billion, or more, and there is no available source of revenue to pay for it. The financing plan is a guess at best, and the revenue projections are significantly flawed with bad assumptions and unacceptable risk at every step. The numbers and analysis underpinning this project simply do not add up to a happy ending.

This report also includes new analysis relating to the Governors' Independent Review Panel Report. The realities of our situation demand additional critical analysis before we proceed past a point of no return. There is a very real danger that we will create an irreversible multi-generational financial disaster. The current proposal is a "debt-bomb" that blows up well after all the consultants, planners, and engineers have moved on to their next projects. Only the State and its taxpayers will be saddled with the ultimate responsibility, creating serious implications for Oregon's overall finances, small businesses, our customers, and all Oregon taxpayers.

P-061-001

There is no doubt that we need to address the congestion on the I-5 system, and the ultimate solution probably involves one or more new river crossings. But the plan must be realistic, affordable, financially sound, and phased to allow for financing contingencies. The current CRC proposal fails these criteria in every respect.

I initially became involved with the CRC Project due to potential impacts on three of our company's stores. As I learned more about the project, and realized the full scope and costs of this mega-project, I developed a broader concern because the economic analysis seemed flawed. In particular I began to doubt that we could pay for it. My research led me to others who shared my concerns, including Mr. Joseph Cortright of Impresa, Inc., who had conducted an earlier analysis of the project. Mr. Cortright is a widely-published leading economic analyst, an expert in regional economic analysis and development, and a Nonresident Senior Fellow at the Brookings Institution. I retained Mr. Cortright to update and expand on his earlier work, and the attached report is the result.

Please take the time to understand this report, and I urge you to take whatever action is within your power to help ensure that we avoid a very big mistake. We need to come up with an affordable, responsible, and buildable solution that works for Oregon and its taxpayers, especially small businesses, and all stakeholders who depend on a well-functioning I-5 system.

Respectfully Submitted,



William C. (Chris) Girard, Jr.
President & CEO
Plaid Pantries, Inc.
503-526-8300
chrisg@plaidpantry.com

IMPRESA
ECONOMICS

Financial Analysis of the Columbia River Crossing

Joseph Cortright,
Impresa, Inc.,
October 2010

Prepared for Plaid Pantries, Inc.

Executive Summary

P-061-002

This report analyzes the forecast accuracy, financial costs, and financial risks associated with the proposed Columbia River Crossing Project. It reaches three principal conclusions: 1) the traffic forecasts on which project finances are based are inaccurate and unreliable; 2) the thirty-year cost of building and operating the CRC will be at least double the $4 billion estimated and could reach $10 billion or more; 3) the project will necessitate a huge increase in bonded public debt and poses substantial additional financial risks including mega-project cost overruns.

1. CRC traffic forecasts are inaccurate.

CRC forecasts grossly over-estimate the traffic growth on the I-5 Columbia River Crossing. These forecasts are critical because they provide both the justification for the sizing of the project (number of lanes and size of interchanges), and because they underpin the financing of the project through toll backed bonds.

The CRC forecasts that traffic over I-5 will grow at an average of 1.3 percent per year from 2005 to 2030, from 135,000 vehicles per day in 2005 to 184,000 vehicles per day in 2030. But in fact, traffic on the I-5 bridges has declined every year after 2005.

Traffic levels in the nearly five years since CRC forecasts were completed have declined by about 7,000 vehicles per day, rather than increasing by about 7,000 vehicles per day as forecast by the CRC. In the five years prior to the CRC forecast (1999-2004) traffic increased on the bridges at only about 0.6 percent annually. The CRC forecasts assumed that traffic growth on the I-5 crossing would accelerate from 0.6 percent annually to 1.3 percent annually. But instead of growing at an accelerating rate, the volume of traffic crossing the bridges has declined every year after 2005, and the traffic growth rate has been decelerating systematically over the past 15 years.

The effects of this forecasting error are significant. In order to reach the 2030 predicted level of traffic in the no-build scenario, traffic growth rates would have to reverse their current decline and then accelerate to 1.8 percent per annum for the next 20 years.

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Portland, OR 97212
503.213.4443
www.impresaconsulting.com

P-061-002

The October 2010 letter from Mr. Cortright attached to Mr. Madore's comment letter was originally sent as an attachment to an October 2010 letter from Mr. Chris Gerard to members of the Oregon legislature. A response to those comments was provided in a January 21, 2011, letter from the ODOT Director to Oregon legislature members. The response letter addresses and refutes the inaccuracies in Mr. Cortright's letter. The response letter is available on the CRC website at: http://www.columbiarivercrossing.org/FileLibrary/Memorandums/PlaidPantry_Response.pdf

P-061-002

CRC forecasts are flawed for a variety of reasons. Most importantly, they are outdated (based on 2005 estimates and a 1994 survey of travel behavior), they use estimates for the value of time that are inaccurate, thereby systematically underestimating likely diversion in the face of tolls. In addition, the estimates contain errors of arithmetic calculation, and were "post-processed"--a euphemism for CRC planners substituting their judgment about appropriate values in place of model outputs to produce higher levels of traffic on the I-5 crossing. The result of this one change was to raise forecast traffic (and associated toll revenues) 6 percent above those produced by unaltered Metro model results.

The inaccuracy of these traffic forecasts casts serious doubt on the findings contained in the environmental impact analysis, because these forecast traffic levels are used as the baseline for calculating the net environmental impacts of build alternatives. Inaccurate traffic forecasts also cast doubt on the financial analysis. If the bridge has less traffic than forecast, toll bonds will not produce the projected levels of revenue, and the project will experience significant revenue shortfalls that could produce bond defaults or require additional state subsidies. The overestimates also mean that both the DEIS traffic analysis and the URS traffic analysis (which uses the same forecast volumes) are leading to an oversized facility relative to likely demand.

2. Total 30-year CRC costs will total nearly $10 billion.

The total 30-year cost of the Columbia River Crossing is likely to approach $10 billion (measured in year of expenditure dollars). In addition to the construction cost of the project, currently estimated at upwards of $3.9 billion, the project will necessitate additional expenditures over the next 30 years estimated as follows:

$3,875 million in construction costs, plus:

$2,700 million in interest payments,
$1,700 million in toll collection costs,
$1,300 million in supplemental project costs,
$ 275 million credit card, sales tax and bond issuance costs
$ 175 million incremental transit operating costs

$10,025 million total 30-year cost

Because the financing for the project requires borrowing in advance of the receipt of federal, state and toll revenues, the CRC will have to borrow money to pay interest while the project is being constructed, and will effectively have to pay interest on top of interest. The scale of the project imposes major opportunity costs on the region—the loss of benefits from other projects that could be financed with this stream of revenue. In addition, because the region's commuters will be paying additional costs, through tolls and taxes to pay for the project, this will reduce consumer income available for spending in the local economy, resulting in a loss of jobs and tax revenues for state and local governments.

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3. The CRC poses major financial risks

P-061-002

The Columbia River Crossing poses a major financial risk to transportation finance in the Portland metropolitan area, and to the state. For this type of project, there is a very high likelihood of cost overruns. The multi-billion dollar scale of the CRC qualifies it as a "mega-project." Given the history of similar scale projects, both nationally and internationally, the likelihood of cost overruns is on the order of 90 percent. Cost escalation for the two most recent large scale projects undertaken by ODOT exceed 200 percent from the DEIS stage (the current stage of the CRC) to current estimated completion cost. While responsibility for cost overruns has not been established, it is likely that these costs would have to be borne by Oregon and Washington, and could be on the order of additional hundreds of millions to billions of dollars. Once construction is commenced, there would be few ways to mitigate or reduce these risks.

The Independent Review Panel criticized cost estimates for the project, observing that the estimates were based on a now discarded design and that they don't address key risks. The panel labeled the cost estimates "problematic" and warned that unless corrected, they would have a "dramatic effect" on the ability of the project to obtain funding.

There is also a considerable risk associated with traffic and toll projections, which have regularly proved to be over-optimistic in practice. The CRC assumes that even with tolling, traffic on I-5 will increase dramatically faster than it has for the past decade. The project's debt service payments are "back-loaded" meaning that the project pays a higher and higher payment each year. As a result, the ability to pay for the project is highly dependent on a sustained high level of traffic growth and regular toll increases. If traffic growth is only half as fast as forecast—for example, 0.8 percent per year during the 2020s, compared to the 1.75 percent increase forecast by the CRC—the project would experience a $1 billion shortfall in net revenues available to pay debt service. There are interest rate risks as well; although current borrowing rates are relatively low, they may increase substantially when bonds are actually issued, three to five years from now.

There are major risks to accomplishing the Columbia River Crossing project according to the schedule proposed by project sponsors. Delay is significant because it is likely to increase the total cost of the project, both due to inflation in the cost of materials and labor, but also due to the interest cost associated with a longer construction period. Special factors—like the need to time in-water construction to avoid salmon migration—can have the effect of magnifying the impact of even minor schedule delays.

The Columbia River Crossing runs the real risk of a financial collapse because it relies on over-optimistic traffic and revenue projections, and downplays the real risks of cost overruns, revenue shortfalls and project delays. There is a significant likelihood of concurrent problems resulting in a situation in which project costs exceed the amounts now estimated, federal and state contributions are less than hoped, and traffic volumes are dramatically less than forecast. Because such a significant portion of the cost of the bridge must be borrowed, these fiscal shortfalls would lead to a cascade of events: the project would deplete borrowed project reserves and would be forced to further increase tolls, which is likely to have the effect of driving traffic levels lower. When reserves are exhausted bond covenants would likely require that the two states make good on any toll revenue shortfalls, either by diverting money from other projects or raising taxes.

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P-061-002

This report was prepared by Impresa, Inc., based on documents obtained from the Columbia River Crossing, and other pertinent information identified in the reference section of this document. Analyzing the financial status of the project is complicated because the CRC is behind schedule in completing important financial planning tasks, and because it has provided some key documents only in response to formal public records requests. We have relied on several documents obtained through a public records request filed by the Pacific Environmental Advocacy Center. Among other things, these documents identify the dollar amount of total interest costs, toll collection costs and pay by plate surcharges that are revealed nowhere in the public presentations of project costs by the CRC. While the project's official schedule (dated November 30, 2009) called for several key financial documents, including a Financial Plan, Financial Risk Analysis and State Funding Documents to be completed in January and February of 2010, we were told by project officials in July that copies of these documents could not be produced because they had not been completed. The fact that significant portions of project costs have been largely unavailable for public review, and key financial planning documents remain incomplete underscores the concerns raised in this report about the level of risk and uncertainty surrounding this project.

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1. CRC Traffic Forecasts Are Inaccurate.

P-061-003

Both the need for the CRC and the financing plans for the CRC depend directly on the accuracy of the traffic forecasts for the I-5 river crossing. The Draft Environmental Impact Statement projects that between 2005 and 2030, traffic crossing the I-5 bridges would rise from about 130,000 vehicles per day to 184,000 vehicles per day. If these traffic forecasts are incorrect, then there would be less need for the capacity provided by the CRC, and the financial contribution estimated to be provided by tolls will not be realized. The CRC traffic projections are directly contradicted by recent trends in traffic in the I-5 corridor.

1.1 CRC traffic forecasts have already proven to be inaccurate

The base year for the forecasts of future traffic for the Columbia River Crossing is 2005. The CRC forecasts that traffic in the no-build scenario on the I-5 bridges will be 184,000 vehicles per day in 2030.

We now have nearly five years of experience—about 20 percent of the planning period--since the base year of the CRC traffic forecasts. How well have their estimates been born out by actual experience?

The Oregon and Washington Departments of Transportation collect data that track the average level of traffic volumes on I-5 across the Columbia River. These data are reported by the Southwest Washington Regional Transportation Council. Data are from the council website: http://www.rtc.wa.gov/data/traffic/brdgawd.asp "Columbia River Bridges." The following table shows average annual traffic over the I-5 Columbia River Bridges for the past 15 years. It also displays the annual growth rate of traffic each year, compared to the preceding year, and the average annual growth rate for three five-year periods.

P-061-003

Please see responses to Joe Cortright's letter (P-047).

P-061-003

Average Daily Traffic, I-5 Bridges,

Year	Average Daily Traffic	Annual Growth Rate
1994	112,988	
1995	116,589	3.2%
1996	118,558	1.7%
1997	120,644	1.8%
1998	124,516	3.2%
1999	126,589	1.7%
2000	126,903	0.2%
2001	125,652	-1.0%
2002	128,162	2.0%
2003	129,657	1.2%
2004	130,279	0.5%
2005	132,603	1.8%
2006	131,916	-0.5%
2007	130,389	-1.2%
2008	126,278	-3.2%
2009	125,436	-0.7%
Annual Average Growth (Five-year Periods)		
1994-1999		2.3%
1999-2004		0.6%
2004-2009		-0.8%

This data shows several key trends. First, for the past four years, average traffic levels on the I-5 bridges have been declining, not increasing. Second, the growth rate in traffic on the I-5 bridges has been decelerating for the entire period shown in this table. Growth rates averaged 2.3 percent per year during the late 1990s, only 0.6 percent per year in the next five year period through 2004, and traffic decreased at an average rate of 0.8 percent per year for the past five years. Third, the slowdown in traffic growth rates and the annual decline in traffic clearly preceded the recession that began in December 2007.

It is apparent that the baseline forecast for growth of I-5 traffic included in the Draft Environmental Impact Statement assumed a very dramatic acceleration in traffic growth from historical trends. To grow from a 2005 level estimated at 134,000 to a projected 2030 level of 184,000 in the DEIS base case, I-5 traffic would need to increase 1.3 percent per year over the 25-year period, 2005 to 2030. That would require more than doubling the rate of growth actually observed in the 1999-2004 period (0.6 percent). And as illustrated above, the historical data show that the rate of traffic increase has been decelerating (and now declining) and not increasing, as forecast in the DEIS. The DEIS and the traffic projections offer no explanation as to why the rate of increase of traffic should more than double from this long term trend.

Figure 1 shows the actual level of traffic reported by the Regional Planning Council (from the table above), and the forecast level of traffic growth required to achieve the 2030 projection of 184,000 vehicles per day. The actual level of traffic recorded in 2009 was roughly 14,000 vehicles less than the more than 140,000 vehicles per day implied by the

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P-061-003

CRC traffic forecasts. Whereas the CRC forecast implied that traffic over the I-5 bridges (in the no build scenario) would increase by almost 7,000 vehicles per day; in reality, the number of vehicles crossing the bridge declined by 7,000.

Figure 1: I-5 Bridge Traffic: Actual v. Predicted

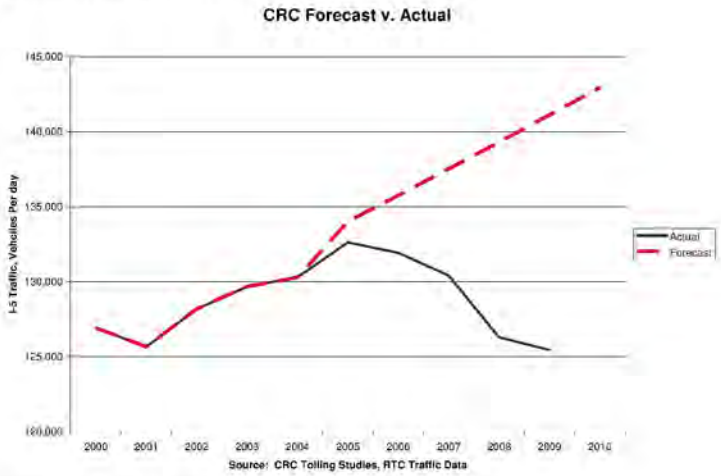
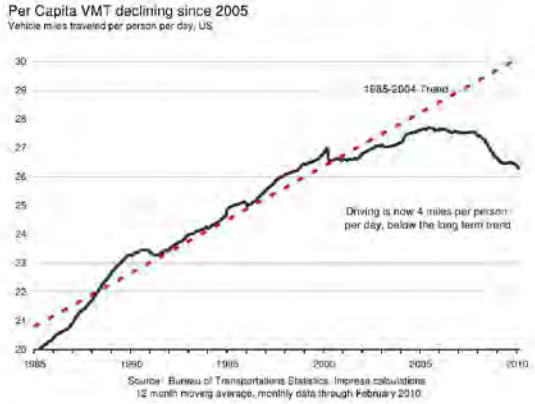


Figure 2: National Trends in Vehicle Miles Traveled



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P-061-003

As Figure 2 makes clear, travel demand estimates based on pre-2005 trends are very likely to overestimate travel demand growth. Following the big increase in gas prices after 2004, American citizens began driving less. That trend has persisted over the past five years.

It might be argued that the past four years of declining traffic are a temporary aberration, and that in the longer term, forecast growth will make up for these declines. This is unlikely to be true for three reasons. First, as noted above, the trend has been for a decelerating rate of growth over the past 15 years. Second, as discussed below, changes in gas prices and consumer behavior that are very long term in nature are behind the decline in CRC traffic. And third, the departure from forecast experienced so far means it is likely impossible to make up the shortfall over the remaining time in the forecast period. In order to reach the expected No-Build 2030 traffic volumes of 184,000 from the actual 2009 level of traffic, traffic would have to increase by 1.85 percent per year for each of the next 20 years. That is a growth rate about forty percent faster than the 1.30 percent forecast in the DEIS, and two and a half times faster than the 0.7 percent growth rate actually observed over the fifteen year period 1994 to 2009. The CRC project materials provide no basis for believing such a dramatic increase in driving will occur.

The tendency to overestimate future traffic levels in mature travel corridors is also apparently an endemic problem with the current methodology used to predict future transportation demand. After a careful review of the literature, the Government Accountability Office found:

> . . . current travel demand models tend to predict unreasonably bad conditions in the absence of a proposed highway or transit investment. Travel forecasting, as previously discussed, does not contend well with land-use changes or effects on nearby roads or other transportation alternatives that result from transportation improvements or growing congestion. Before conditions get as bad as they are forecasted, people make other changes, such as residence or employment changes to avoid the excessive travel costs.
> (Government Accountability Office, 2005)

The weakness of transportation models in accurately predicting future traffic levels is a continuing problem. So it is not merely the CRC traffic projection model that is problematic; rather the entire class of four-step models (trip generation, assignment, mode, routing) have proved inaccurate in practice. After an exhaustive review of the state of the art, the Transportation Research Board of the National Academies wrote:

> "In 2005, as has been true for the past four decades, these models could not provide accurate information to inform decision making on many transportation and land use policies or traffic operation projects."
> (Committee for Determination of the State of the Practice in Metropolitan Area Travel Forecasting, 2007)

P-061-003

While technology has allowed for faster computation, and more detailed mapping, they conclude:

> "The practice of metropolitan travel forecasting has been resistant to fundamental change. Every 10 years or so there begins a cycle of research, innovation, resolve to put innovation into practice, and eventual failure to affect any appreciable change in how travel forecasting is practiced."
> (Committee for Determination of the State of the Practice in Metropolitan Area Travel Forecasting, 2007) pages 123-124.

As a result of over-forecasting, the size of the CRC may be much larger than needed. Traffic volumes are falling, even without tolls. If the I-5 crossing were tolled, many fewer vehicles would cross, depressing traffic levels still further and revenue would be correspondingly less than forecast.

The no-build scenario serves as the base case for evaluating all of the other alternatives—to the extent that the no-build scenario is flawed, the traffic estimates for the build alternatives are also similarly flawed.

Even the traffic analysis by URS, which served as the basis for a recommendation to reduce the bridge from 12 through lanes to 10, is predicated on the flawed DEIS forecasts. A more accurate forecast of future travel volumes would indicate that much less capacity is needed over the Columbia River.

1.2 CRC traffic forecasts do not account for higher gas prices

CRC traffic forecasts appear to be badly out of date, and there is no evidence that they have been adjusted to deal with current gasoline prices or development trends. The CRC traffic forecasts are poorly documented, and don't indicate what baseline data were used, what assumptions were made, and what error and uncertainty factors are associated with these estimates. It appears from the documents included in the Draft Environmental Impact Statement that traffic projections were made in 2007, based on 2005 data. The key measures of traffic activity (184,000 crossings of the I-5 bridge in the no-build, and 178,000 in the build alternatives), have remained essentially unchanged for several years. (See for example, Draft Environmental Impact Statement, Summary, Exhibit 26 Summary of Transportation Effects and Cost for Each Alternative, Page S-30). The forecast documents, including those released in 2010, use the same numbers (184,000 in the no-build, and 181,000 for the LPA) as the project has publicly quoted since the DEIS was released in 2008. The forecast documents refer to the "current year" for traffic purposes as "2005." The modeling was based on Metro's transportation model (Columbia River Crossing, 2010f). The Metro model was calibrated based on behavioral data collected in 1994 and assumes that real gasoline prices would not increase at all, i.e. that gasoline prices increase no faster than the rate of inflation (Higgins, 2008).

P-061-003

There is clear evidence that the persistently much higher level of gas prices since 2005 has produced a sea change in consumer behavior. Nationally, per capita driving has been in decline since 2004, and is now at 1999 levels. (See Figure 2 on page 6.)

Consumers are not only driving less, but are scrapping cars faster than they are buying new ones. Nationally, the number of vehicles in operation declined by four million in 2009 (Brown, 2010). In Oregon, vehicle registrations have declined by 30,000 compared to the previous year (Har, 2010).

The rise in gasoline prices and a growing interest in alternatives to car-dependent living has triggered a shift in housing markets within metropolitan areas. The biggest price decreases in housing and the highest foreclosure and default rates have been recorded in outlying suburban locations (Cortright, 2008).

The CRC's transportation model is based on observations made in 2005, and assumes the consumers will continue to behave as they did in 1994 (when gasoline cost $1.10 gallon). As a result CRC predicts the rate of increase of vehicle travel will be double that of the previous decade. This is highly suspect in a world where gasoline prices have more than doubled, where driving is in decline, and consumer behavior patterns are obviously changing.

1.3 CRC traffic forecasts are outdated

The traffic forecasts used to justify the need for the project, estimate its environmental impacts, and develop its financial plan appear to be significantly outdated.

The materials documenting these forecasts do not clearly reveal the dates on which they were prepared, or the vintage of the data used to estimate key variables. The base year for the forecasts in the DEIS and in subsequent financial planning documents is 2005. It is apparent that the toll revenue forecasts relied on the same forecasts shown in the DEIS, i.e. total levels of traffic in the no-build scenarios match the forecasts in the DEIS, exactly: 184,000 vehicles per day in the no-build replacement bridge scenario. Data for 2010: Traffic Effects for Tolling Scenarios, (Columbia River Crossing, 2010f); data for 2008: Traffic Technical Report, Exhibit 4-1 (Columbia River Crossing, 2008b). The traffic technical report is dated January 2008, and the text of the report indicates that many technical reports were completed in "late 2007." Again, this report describes 2005 as the "current year" for traffic comparison purposes.

Neither the DEIS, the traffic technical report to the DEIS, or the subsequent documents available for this review indicate the year in which traffic forecasts for the project were undertaken. It appears from these documents that the forecasts were made in 2006, using a base year of 2005. The forecasts also appear to rely on a Metro regional transportation model that was calibrated based on the household travel survey conducted in 1994 .

P-061-003

1.4 CRC forecasts inflated I-5 traffic estimates using "post processing"

While the CRC traffic forecasts based their initial estimates on the regional transportation model, they adjusted these estimates to shift some forecast traffic from I-205 to I-5. The authors of the study labeled this manual adjustment "post-processing"—but it simply means that they used their own judgment to select higher values for I-5 than those produced by the regional transportation model. The reasonableness of this adjustment is debatable. The CRC claims that an analysis of 2005 actual traffic data shows that actual traffic on I-5 was underestimated, relative to I-205 by the regional model. The authors made no apparent attempt to see if their adjustment was supported by data in any subsequent year. But each year after 2005, traffic volumes have been proportionately higher on I-205 than I-5, undercutting the stated basis for this "post-processing" adjustment.

According to the report, the effect of the "post-processing" adjustment was to increase traffic volumes assigned to the I-5 bridges by 6 percent over the levels predicted by the regional transportation model without this modification.

The report concedes:

> However, the post processing methodology forecasts less traffic diversion from I-5 to I-205; forecasted 2030 average weekday volumes on the I-5 Bridge are about 6 percent higher with the post-processing methodology than with the regional travel demand models.
> (Columbia River Crossing, 2010b).

The effect of this adjustment is to understate the amount of diversion that will occur to I-205, even with the relatively high value of time estimates used in the travel demand model.

Despite its technical sounding name "post-processing" really represents a judgment on the part of the CRC to disregard the outputs of the Metro travel demand model, and to manually choose the values for traffic.

1.5 CRC forecasts over-estimate the value of travel time, under-estimating toll diversion, and over-estimating revenues

The toll revenue forecasts estimate traveler response to tolls by estimating the value that travelers attach to time savings, and then translating the cost of tolls into a time equivalent penalty. For example, the toll study estimates that travelers value their time at about $18.89 per hour, meaning that a toll of $2.00 has the same effect on travel behavior as a 6 minute delay. (Here's the math: at $18.89 per hour, each minute saved is worth about 31 cents. At this rate, two dollars would be equal to about 6.3 minutes of time). Since travel models are used to predict traveler behavior based on travel time between

P-061-003

points, these delay values can then be incorporated into travel demand models and used to predict changes in travel behavior.

Use of a single amount for the value of time for all commuters is inappropriate and underestimates the effect of tolls especially on lower income households. At least 7,000 Clark County residents who commute to Oregon, according to the Census Bureau, earn less than $1,250 per month at their primary job. Most of these persons earn $10 per hour or less. The transportation literature suggests that most such workers value travel time at one-half their wage rate. For these low paid workers, their value of travel time is likely to be $5 per hour (or less) and not $19 per hour. Consequently, tolls are much more likely to reduce commuting (and Oregon job holding) by lower income residents. This is not analyzed in the financial projections or the DEIS.

This shortcoming has both financial and equity considerations. For lower income travelers (and those who place a lower value on their time), the toll has a much larger impact on travel behavior. For travelers who value their time at $5 per hour, a toll of $2.50 is the equivalent of 30 minutes delay in terms of shaping travel behavior. The CRC analysis assumes that all travelers treat the toll as having a six minute time penalty.

The estimate of $18.89 per hour as the value of time for all commuters is shown in *Description of Revised Toll Model and Traffic and Gross Revenue Projections for Tolling Scenarios* (Columbia River Crossing, 2010b).

> Two different VOTs, peak and off-peak, were assumed for passenger cars in the Metro modeling:
> Peak periods (AM and PM): $18.89 (2009 $) which equates to $13.33 (1994 $)
> Off-Peak periods: $12.57 (2009 $) which equates to $10.38 (1994 $)

Value of time estimates are a critical part of tolling assumptions. Independent analysts of toll revenue forecasts routinely call for a deep discount to value of time estimates in evaluating the credit-worthiness of toll forecast estimates. Fitch's criteria for stress testing toll revenue forecasts call for re-computing revenue estimates after reducing the estimated value of time 50 percent to 75 percent (Seattle-Northwest Securities Corporation & Montague DeRose and Associates, 2007). Such a stress test is an integral part of preparing what is referred to as an "investment grade" revenue forecast. In the case of the Columbia River Crossing, this would require reducing the value of time to between $4.72 and $9.45 for peak hours and $3.33 and $6.67 for non-peak hours.

The Independent Review Panel noted that an investment grade analysis has not been undertaken, and that one will be required:

> It is clear that if tolling is to be part of the investment package, where tolls are the source for paying back revenue bonds, an investment grade analysis will have to be conducted. Such an analysis will have to be at a much higher level of specificity, for example, knowing what the tolling schedule will be. This investment grade analysis will include another travel demand analysis, most likely requiring a more up-to-date database upon which to calibrate the model. Project financiers typically

P-061-003

> will only accept as investment-grade quality work that is performed by certain entities who typically have proven experience in conducting such studies. Independent Review Panel 2010, page 176.

Using a lower value of time has a direct effect on the traffic and toll revenue estimates prepared for the Columbia River Crossing. A lower value of time would mean fewer trips over the I-5 bridge and more diversion to alternative routes, especially in the event that the I-205 bridge is not tolled. It would also mean that the I-5 bridge tolls would produce lower levels of revenue.

In addition to the problems in the estimation of travel times overall, and for low income travelers, there is also an obvious math error in the computation of the inflation-adjusted value of time. The value of time calculations are adjusted to different year's dollars based on two different indices: at least one is in error. On pages 3-1 through 3-3, the report claims that a wage of $18.86 in 2009 dollars is worth $10.38 in 1994 dollars and that a wage of $12.57 2009 dollars, is worth $10.38 in 1994 dollars. The first calculation implies a 1994 dollar is equal to .71 2009 dollars, the second implies a 1994 dollar is equal to .83 2009 dollars. One must be wrong.

1.6 Inaccurate toll forecasts threaten CRC financial viability

Traffic forecasts underpin both the rationale for building a larger capacity crossing over the Columbia River and the financial plan for paying for the project. If traffic levels are less than forecast, as is already apparent, then a key part of the plan for financing the project is compromised.

The CRC toll bonds are planned to have a highly back-loaded amortization schedule (Columbia River Crossing, 2010c). This means repayment depends heavily on sustained annual increases in traffic and regular toll increases. If traffic levels do not increase as fast as projected, it would trigger a significant revenue shortfall. To calculate the sensitivity of toll revenue estimates we modified the CRC forecasts to assume a 50 percent lower rate of traffic growth than that used by CRC. (From 2020 to 2030, CRC assumes that traffic will increase about 1.75 percent each year, and 1.0 percent thereafter). We examined the effect of annual increases of half that amount, starting from the opening year (2018) estimate used by CRC. Reducing the growth rate (in the 2020's, for example to 0.875 percent per year), has the effect, over the 30-year life of the bonds, of reducing gross toll revenue by about $1.24 billion, and reducing net toll revenue (the amount available after collection costs available to make debt service payments), by slightly more than $1 billion.

This is not merely a theoretical problem. Predicting net revenues for tolled facilities, especially when there is no recent history of tolling in the area, is even more difficult than predicting future traffic volumes. Experience in Washington State shows that faulty forecasts can easily and quickly produce revenue difficulties for toll bridges. In 2007, WashDOT completed a second Tacoma Narrows bridge, and imposed tolls to finance the

P-061-003

cost of construction. In 2007, just prior to opening the Tacoma Narrows Bridge, WSDOT forecast that revenues in FY 2010 would be $62,937,827 (Washington State Department of Transportation, 2008). In a more recent forecast, updated through April, 2010, however, WSDOT forecast that FY 2010 revenues would be about 25 percent less, $45,207,519 (Washington State Department of Transportation, 2010a). The toll revenue shortfall was a result of lower than anticipated traffic and slower than anticipated increases in toll levels. Political opposition to higher tolls prompted the state to defer the toll increases that were assumed in the project's original financial plan.

One way forecasters attempt to deal with uncertainty is to develop alternative scenarios. The CRC has failed to undertake any serious sensitivity or alternatives analysis. They applied a "15 percent bandwidth" to their estimates, i.e. computing the effect of a 15 percent smaller volume of traffic and a 15 percent higher volume of traffic than called for in their forecast. They provide no basis for assuming a 15 percent error factor is sufficient. It is already the case, as illustrated in Figure 1 that the forecast for the year 2010 has an error of more than 10 percent in total traffic volumes in just four years. And, as indicated above, the Tacoma Narrows Bridge experienced a 25 percent shortfall in revenue from forecast over a period of just two years.

The CRC financial plans assume that the authority setting the tolls for the Columbia River Crossing is willing and able to increase tolls each year by at least the rate of inflation (assumed to be 2.5 percent per year). If the authority fails to increase tolls by this amount, or delays the increases, the project will experience a shortfall in revenue. Indeed, this has been a contributing factor to revenue shortfalls for the Tacoma Narrows project.

2. Total 30-year CRC Costs will total nearly $10 billion.

P-061-004

How much will the Columbia River Crossing project cost? Widely distributed public materials circulated by the Oregon and Washington Departments of Transportation state the project will cost between $2.6 billion and $3.6 billion . (See for example "Project Fact Sheet" (Columbia River Crossing, 2010d). That number is just the up-front construction cost and does not include the cost of financing, including interest, or the cost of operations, especially toll collection. Many of these costs will be incurred over a period of decades, rather than being paid "up-front." This memorandum compiles the additional costs not included in the construction-only cost estimate.

The actual cost of the Columbia River Crossing is difficult to portray because many of the costs will be paid over a number of years. To provide a fuller and more complete picture of project costs, we have developed a set of estimates of the 30-year costs associated with constructing and operating the Columbia River Crossing.

This task is further complicated because the financial plans for the Columbia River Crossing have not been fully worked out. Project sponsors are assuming that most of the money will come from state and local governments, and the remainder from toll-backed bonds. About $400 million would need to come from earmarked federal funds from a yet-to-be-enacted federal transportation bill, and related federal gas tax increase.

CRC documents show plans to borrow $1.3 billion over 30 years, to be repaid by future toll revenues. When we compute the total cost of the project over the next 30 years, the total price tag will more than double.

Thirty-Year Estimate of Columbia River Crossing Costs

Category	Thirty Year Cost, Millions, Year of Expenditure Dollars
Construction Cost	3,875
Interest Cost	2,700
Toll Collection Cost	1,700
Credit Card Cost	142
Sales Tax	117
Bond Issuance Cost	16
Transit Operating Cost	175
Added Project Costs	1,300
TOTAL	10,025

The $2,700 million is the interest (excluding principal repayment) over the 30-year life of the $1,300 million bonds; the $1,700 million is the cost of building and operating an electronic transponder and billing system to collect tolls. Credit card fees are what CRC will pay banks to process electronic payments. The bond issuance costs are the fees (and discount) the bankers will charge for preparing and issuing bonds.

IMPRESA

P-061-004

The cost of financing is not relevant to environmental and NEPA review. However, see the finance plan in Chapter 4 of the FEIS for related information. Also, for a response to the letter from Plaid Pantry expressing concerns regarding construction costs, traffic modeling, and financial risks, please see the January 21, 2011, letter from Matt Garrett, ODOT Director, to members of the Oregon legislature. That letter can be found on the CRC website at: http://columbiarivercrossing.com/FileLibrary/Memorandums/PlaidPantry

Also see the March 25, 2011, letter from Matt Garrett to Chris Gerard, President of Plaid Pantry, available from the project office.

In addition, see the responses to Mr. Cortright's FEIS comment letter (P-047) regarding traffic forecasting, financing and other related issues.

P-061-004

One technical note: These figures are in terms of year of expenditure dollars (i.e. not adjusted for future inflation). These amounts are taken directly from budget and amortization schedules that estimate these costs in the dollars of the year in which they will be spent.

Toll bonds might appear to some to be inexpensive up front, but roughly speaking, each $1 of the project financed by toll bonds results in an additional 30 year cost to bridge users of more than $3.00, about $2.00 for interest and about $1.00 for toll collection costs. In other words, bridge users will have to pay a total of $4.00 in tolls for each $1.00 of bridge construction costs that are financed by toll bonds.

2.1 Construction Cost

No one is certain how much the Columbia River Crossing will cost to build. There is still considerable debate over what form the project will take.

Publicly, the CRC promotional materials claim that the cost of constructing the Columbia River Crossing, as currently proposed, is between $2.6 billion and $3.6 billion (Columbia River Crossing, 2010d). Specifically, CRC states:

> Based on fall 2009 design refinements and additional engineering, construction is expected to cost $2.6 to $3.6 billion (in year of expenditure dollars). Funding is expected from federal and state sources and tolling.

These estimates are subject to considerable uncertainty and risk. The project scope may be changed—discussions are currently underway to dramatically alter the project's profile on Hayden Island—and there are a series of other sources of risk—described in Section 3. It is also clear from the wording of the fact sheet "construction is expected to cost $2.6 billion to $3.6 billion" that these numbers do not include costs for financing, collecting tolls, and operating the project.

However, the $3.6 billion cost estimate is based on a bridge design (closed-box segmental girder) that has now been discarded in favor of a double-decked open web design. The new design has not been subjected to a detailed Cost Estimate Validation Process. According to the Independent Review Panel, because the open web design has never been built at this scale, the cost could be much higher than the box girder design (Independent Review Panel, 2010).

According to materials presented to the Independent Review Panel, the project may cost as much as $3.877 billion. These estimates are based on the so-called 90 percent probability that costs will not exceed this amount and are for the "full" project. See Independent Review Panel, 2010, page 173. We adopt this figure as our baseline estimate of construction costs.

2.2 Interest Cost

Neither Oregon nor Washington have $3.9 billion on hand for this project, and as a result will have to borrow a significant portion of the funds needed to finance construction. Both states will incur significant interest and finance charges to borrow the money needed

P-061-004

to pay for the bridges. These interest and financing costs are not included in the CRC's estimate of a $2.6 to $3.6 billion price tag for the bridge.

This is disclosed in the report on toll financing:

> The use of toll bonds will increase the total costs paid during and after construction due to the added interest and issuance costs. However, these financing costs are treated separately from the project capital cost during construction.
> (Columbia River Crossing, 2010e)

The CRC's need for borrowing—and the attendant financing and interest costs—will be driven by the mismatch between the time it receives its revenue (from tolls and from federal and state sources) and when it needs to pay contractors who will build the project. The project will need to pay its construction costs prior to the time the bridge opens.

At a minimum, the CRC will pay interest on the bonds that are to be repaid from future toll revenues. It is also possible that the project will have to borrow additional money against future payments of state and/or federal revenues earmarked for the project. Project funding has not been approved by either state or by the federal government, and as a result, the payment schedule and amounts of funding to be provided from state and federal sources are unknown. It is likely that construction will commence before all projected federal and/or state revenues are in hand, so in order to finance construction it would be necessary for Oregon and Washington to issue bonds, and pay interest, in order to build the project. The Draft Environmental Impact Statement anticipates the possible use of so-called "GARVEE" bonds (grant anticipation revenue vehicle bonds). These bonds would enable the state to spend money now against anticipated future federal grants (Columbia River Crossing, 2008a). Oregon has also bonded money from vehicle registration fee increases in order to be able to accelerate timing of its bridge repair program. In all of these cases, the amounts paid in interest on bonds reduce the amount of money available to pay for transportation projects.

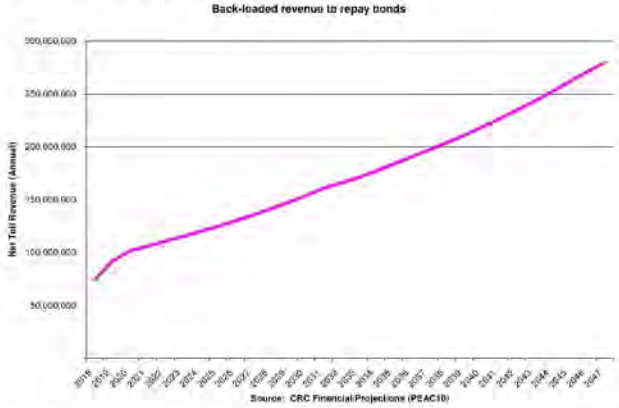
Our baseline estimate of interest costs is $2.7 billion, based on the project's own estimates of thirty-year interest payments on toll-backed bonds (Columbia River Crossing, 2010c).[1] This estimate is based on issuing $1.4 billion dollars of bonds, in three series. This high interest cost is the product of a complex financing structure. First, money has to be borrowed several years in advance of completion of the bridge, so the project has to borrow additional funds to cover "capitalized interest"—i.e. an additional $112.6 million to pay interest on the bonds during the period before toll revenues are expected to start flowing. Second, the amortization and payment schedule for the bonds is "back-loaded"—rather than having the same payment each year, the bond repayment amounts increase each year (based on the assumption that both traffic and toll rates will increase each year). Debt service payments start out (following bridge opening) in 2018

[1] The total amount of interest payments associated with toll-backed revenue bonds has not been disclosed in any publicly available reports issued by the Columbia River Crossing. These statistics were obtained from a report released in response to a public records request, and identified by CRC as PEAC-54.

P-061-004

at less than $60 million annually and escalate steadily to more than $250 million per year at the end of the repayment period in 2047.

Figure 3: Debt Repayment Schedule



The combination of carrying capitalized interest during construction and back-loading amortization dramatically increases the total amount of interest paid compared to the kind of garden variety borrowings with which most consumers are familiar. In effect, the CRC borrows money to make interest payments while the project is under construction, and ends up paying interest on top of interest. For example, if one could borrow $1.3 billion over 30 years, with a level repayment schedule (like a home mortgage) this would necessitate annual payments of about $93.5 million per year for a total of $2.8 billion in repayments over 30 years (30 * 93.5 = 2,805). Over the life of the bonds, $1.3 billion would be attributable to principal, and the remainder--$1.5 billion—represents interest costs. In rough terms, the additional interest associated with construction period financing and back-loading amortization works out to an added cost of $1.2 billion over the cost of a simplified mortgage like borrowing arrangement.

In addition, depending on the timing of payments from state and federal governments, the project could need to borrow larger sums to finance construction, and incur additional interest costs as a result. The CRC financial analysis assumes that federal and state contributions are available, in full, in the early years of project construction, and that issuance of toll-backed bonds (and accruing interest costs on these borrowings) can be postponed to later years.

> Toll bond proceeds are assumed to be received in the middle and latter years of construction to maximize their funding contribution, and other funding sources are assumed to cover construction costs in the initial years.
> (Columbia River Crossing, 2010e)

IMPRESA

P-061-004

If federal and state money is available later, or spread over a period of years (as is likely) this will further increase interest costs. In addition, the two states may issue bonds to finance their portions of the project costs against future revenues (such as gas taxes or vehicle registration fees), and these sources will also involve additional interest costs beyond those calculated here.

Interest costs could be considerably higher, and bond funding proceeds could be lower, for a variety of reasons. First, the interest rate charged on bonds could be higher than 6 percent, the amount assumed in the toll revenue analysis. The toll revenue analysis examined the effect of 7 percent interest, plus a higher level of debt service coverage, if the bonds were issued solely as revenue bonds, guaranteed by the tolls, with no state guarantee. In this case, the net amount of revenue likely to be lent declined by almost half. The non-recourse debt structures yield only between 50 percent and 55 percent of the amount yielded by state-backed debt (Columbia River Crossing, 2009b).

2.3 Toll Collection Cost

The CRC will need to build and operate a system for collecting tolls from bridge users. The CRC anticipates building a barrier-free tolling system. Most users would buy electronic transponders (small radio receiver/transmitters) that record travel across the bridge and bill users automatically. Those who didn't have a transponder would have their license plates photographed and would be billed through the mail using a system called "pay by plate." This system will require motorists to buy transponders, and for the states to build and operate a system for monitoring and billing transponder users, and for reading license plates, preparing and mailing bills, and collecting bills. All of these costs would be passed on to bridge users through the toll system. Transponder users would pay a standard toll rate (that would include the cost of operating the transponder system), and pay-by-plate users would pay the standard toll, plus a surcharge of $1.00 to 1.25 to cover the added costs associated with billing. The costs of operating this toll collection system are not included in the $2.6 to $3.6 billion construction cost of the CRC.

According to documents released by the CRC, the annual costs of operating the collection system would be $27 million in 2018 rising to $90 million in 2047 (Columbia River Crossing Toll Bond Program, Scenario 1 - Base (DEIS) Toll on I-5 Only: (Baseline (Post Processed) Forecast) State-Backed Bonds - 30 Year Term, (Columbia River Crossing, 2010c)). Over the first 30 years of project operation, the estimated total cost of operating the toll collection system would be $1,695 million. This is our baseline estimate of toll collection costs.

2.4 Bond Issuance Cost

The states of Oregon and Washington will have to issue bonds to raise the funds needed to pay for the construction of the CRC. In addition to the interest costs associated with repaying the bonds, the two states will have to pay financial and legal costs associated with bond issuance. According to documents released by the CRC, the costs of such

P-061-004

issuance are estimated at 0.8 percent of the face amount of bonds issued (Columbia River Crossing, 2007). This reflects the bond underwriters discount and the costs of legal and other work in association with bond issuance.

In its analysis of bond financing costs, the CRC estimates a cost of $15.6 million for issuance expenses in the DEIS base case scenario. Columbia River Crossing Toll Bond Program, Scenario 1 - Base (DEIS) Toll on I-5 Only: (Baseline (Post Processed) Forecast) State-Backed Bonds - 30 Year Term. (Columbia River Crossing, 2010c). We use this as our baseline estimate of financing costs. As with interest costs, the amount could be higher depending on the timing of state and federal payments for the project.

2.5 Credit Card Cost

It is anticipated that a majority of those who use the CRC will pay for tolls by using debit or credit cards. The CRC will have to pay processing fees to banks and credit card companies associated with accepting these payments. According to documents released by the CRC, (Columbia River Crossing, 2010b), the annual costs of credit/debit card processing would be $2 million in 2020 rising to more than $5 million in 2035. Over the first 30 years of project operation, the estimated total cost of processing credit and debit card payments would be $142 million.

2.6 Sales Tax Cost

Washington construction projects are subject to state sales taxes. It is not clear from the DEIS that the project sponsors have made any allowance for the cost of paying these sales taxes to the state of Washington. Sales taxes do not appear to be included in the cost estimate. A search of the Columbia River Crossing website found no references to sales taxes to be paid on the construction of the bridge itself (Google search for "sales tax" site:www.columbiarivercrossing.org).

In the case of other major projects, such as the proposed 520 bridge in Seattle, the state has allowed for a sales tax deferral, i.e. allowing the sales tax to be paid after the bridge is constructed, out of toll revenues. For the 520 bridge, with a total price of $4.6 billion, the amount of the sales tax deferral is $300 million (Washington State Department of Transportation, 2010b). This works out to 6.5 percent of the cost of the project. If 50 percent of the CRC is in Oregon and not subject to the tax, then sales tax would apply only to the Washington portion. With a total construction cost of $3.6 billion, the Washington sales tax liability would be (.065*.5*3,600 million) or $117 million.

Based on this analysis, we use $117 million as our estimate of the cost of sales taxes due to the State of Washington for the CRC. This number could be higher or lower depending on the portion of the project built in Washington.

2.7 Supplemental Project Cost

In addition to the direct cost of constructing and operating the Columbia River Crossing,

P-061-004

it is likely that the traffic generated by this project will necessitate further expansions of the freeway system in Portland. The Oregon Department of Transportation has already identified the need for capacity expansion between the Fremont Bridge and I-84, a need that will be substantially increased by the construction of the Columbia River Crossing. ODOT estimates that such a project would cost between $780 million and $1.3 billion over and above the cost of the CRC (Tindall, 2008). In addition, since this would have to be financed exclusively by Oregon (i.e. no toll revenues, federal earmarks or Washington contribution), it would require a financial contribution from the State of Oregon in addition to the state's share of the CRC project.

The need for this expansion was confirmed by the URS analysis of the Columbia River Crossing—the effect of building the CRC is to move the traffic bottleneck on I-5 from the existing Columbia River Bridge, to the Rose Quarter area. The URS report concludes that without a change to the Rose Quarter, the effect of the CRC project will be to reduce travel times only one minute compared to the no-build.

> Compared with the No-Build conditions, the LPA Full Build and Phase 1 would reduce the average travel time during the two-hour peak period within the bridge influence area (BIA) from 19 minutes to 18 minutes (A.M. peak) and on I-5 northbound from 14 minutes to 6 minutes (P.M. peak). The relatively small travel time reduction on I-5 southbound is mostly due to the bottleneck around the I-5/I-405 split. (URS, 2010).

The Independent Review Panel convened to examine the project reached the same conclusion. Unless the chokepoint at the Rose Quarter is fixed, the utility of the entire CRC investment is jeopardized. They write:

> "Questions about the reasonableness of investment in the CRC bridge because unresolved issues remain to the south threaten the viability of the project." (Independent Review Panel Report, 2010, page 112).

The panel recommends a new set of traffic studies to test whether the CRC will simply shift the bottleneck south, and call for ODOT and the City of Portland to "fully develop a solution for I-5 from I-405 to I-84" and to program that solution in conjunction with the phasing of the construction of the CRC (page 113).

The Chokepoints report published by TRIP, a Washington DC based road advocacy organization, identified the I-5/I-405/I-84 exchange, that portion of the I-5 system between the Fremont Bridge and I-84, as the second most severe bottleneck in the Portland metropolitan area (TRIP, 2010). It actually carries more traffic than the I-5 bridges (135,000 vehicles per day vs. 127,000 for the I-5 bridges). According to the Chokepoints report, this project will require $800 million to $1.3 billion and $300 to $350 million for improvements to Broadway-Weidler and widening I-5 to 3 lanes in each direction (TRIP, 2010).

Based on the information in the 2008 ODOT report and the 2010 Chokepoints report we use a figure of $1.3 billion as the cost of supplemental projects that will be necessitated to

P-061-004

improve traffic flow on I-5 in the wake of the CRC project. The actual cost could be higher or lower depending on the scope of supplemental projects actually undertaken to address traffic congestion in this corridor.

2.8 Negative Economic Impact Costs

In addition to tax revenues, the project assumes that a portion of the project revenues will come from tolls levied on traffic using the I-5 bridge. The toll payments are estimated to be $120 million annually when the bridge opens to traffic, and rising to $220 million annually in 2030. These amounts include both the direct amount of tolls, as well as the $1.22 (2015) surcharge that will be levied on bridge users who do not purchase transponders. Money spent on tolls will largely be from local households and businesses, and represents money that would otherwise be spent elsewhere in the local economy. Again, the DEIS does not consider the economic or environmental impacts of shifting $100 million or more annually from consumer and business spending to toll payments. These impacts are likely to include lower levels of purchases of goods and services from local businesses, an associated reduction in employment at such businesses, and a loss of tax revenues from a lower level of business activity.

There will be significant economic impacts to the region from spending this $4 billion in construction costs, plus toll payments of $100 million or more annually indefinitely. The DEIS does not consider the impact of these diversions of money from other uses, and therefore omits a significant impact.

We have not undertaken an input-output analysis to compute the exact impact on sales and jobs, but we use as a rule of thumb that each $1,000,000 in consumer and business income diverted to pay for tolls produces a loss of ten jobs. This means that the project would result in the loss of 1,200 jobs initially rising to 2,400 jobs by 2030. While the project would result in temporary job creation during construction, this long term job loss would continue over the life of the project.

2.9 Transit Operating Costs

CRC's proposed Columbia River Crossing includes a light rail transit line extending the existing Max Yellow Line from the Expo Center in North Portland to a northern terminus in Vancouver. A portion of the costs of this line would be paid from fare box revenue, but in general, operating costs of light rail facilities exceed passenger fares. According to the Draft Environmental Impact Statement, the net incremental increase in operating costs for light rail above transit service that would be provided in the no-build case would be $2.96 million annually in 2010, with that amount expressed in 2007 dollars. The DEIS does not provide a year-by-year breakdown of net incremental operating costs. To estimate the 30-year cost of transit operations, we use the $2.96 million per year figure for each year, and convert it to year of expenditure dollars. The total 30-year incremental cost of transit is approximately $175 million.

2.10 Opportunity Cost

P-061-004

Opportunity cost is a term used by economists to describe the idea that if resources are used for one purpose, they cannot be used for some other purpose. Resources used to construct the Columbia River Crossing, for example, cannot be used for other transportation projects in the Portland metropolitan area. In the specific case of the Columbia River Crossing, there are opportunity costs for all of the transportation funds that would be shifted to pay for this project that could otherwise be used for other transportation projects in the Portland metropolitan area. There are three specific areas in which the region would be likely to experience significant opportunity costs in association with the Columbia River Crossing: federal earmarks, federal new starts funding, and state funding allocations.

Earmark Opportunity Costs. Federal earmarks or allocations for the CRC will reduce revenue available for other projects in the region. Like most other states, the State of Oregon used its political clout to get a special allocation of federal funds, or earmark. Virtually every state's delegation seeks and receives similar earmarks based on their delegation's priorities.

If the state makes the CRC its priority, it forgoes its opportunity to seek funding for other eligible projects that would provide statewide benefits. For example, in the last round of federal transportation funding, the state relied on earmarked federal funds to underwrite a significant portion of the cost of repairing state highway bridges. If the state seeks earmarks for the CRC, it will not be able to obtain those same earmarked funds for other projects.

CRC proponents have claimed that CRC earmarks will not reduce funding for other projects because the CRC is a "project of national significance" that would qualify for a separate source of funding. But in fact, the legislation that would allocate the next round of transportation funding has not been passed by either house of Congress, so no such program or source of funding now exists. And the leading proponents of transportation reauthorization such as Representative James Oberstar have specifically rejected the idea of earmarking funds in the next transportation bill. And while the proponents of the project regard it as having national significance, there is no evidence that anyone outside the region shares their view. Every region regards its projects as having national significance.

New Starts Opportunity Costs. The CRC anticipates that some $750 or $850 million of the project cost will come from federal "new starts" rail funding. But there is a limited amount of such funding, and historically, the Portland metropolitan area has gotten a disproportionate share of such funding. The region has another major project underway—the Milwaukie light rail line—which would also be funded from this same New Starts program. Funding for the light rail portion of the CRC project will compete for a limited pool of funds for new rail starts from which the region is asking for funding for the Milwaukie light rail.

IMPRESA

P-061-004

State Funding Opportunity Costs. The project will jeopardize state funding for other projects in the Portland metropolitan area. The Columbia River Crossing will be perceived by state policymakers as a project benefiting the Portland metropolitan area, and will jeopardize the ability of the region to get state funding for other projects in the region. In 2009, when the State Legislature identified a list of projects to be funded with increased gas taxes and vehicle registration fees, the Portland metropolitan area got a far smaller share of total funding than its share of population. It is likely that any state earmarks of funding for the CRC would reduce the likelihood that state funds would be allocated to the Portland area for other projects.

In the funding plan provided to the Independent Review Panel on June 17, 2010, the CRC makes it clear that it is counting on diverting funds from existing state and federal programs to pay for the costs of the project. The document "Funding Report" shows that federal money from "Safety-LU and federal interstate maintenance funds (both of which could be invested in other projects) have been used to pay for Columbia River Crossing planning (Columbia River Crossing, 2010a). Similarly the Oregon Transportation Commission allocated $30 million from House Bill 2001 to pay for Oregon's share of transportation planning costs, reducing funding available for other projects in Oregon.

3. The CRC Poses Major Financial Risks

P-061-005

The preceding section identifies the costs of the Columbia River Crossing, assuming that everything goes as currently planned. But there are considerable risks and uncertainties associated with the cost estimates outlined above. It is possible that a number of factors could cause the project costs to be considerably higher than the baseline estimates presented in Section 1.

3.1 Cost Overrun Risk

The project is at risk for substantial cost overruns. These costs would have to be met by the states.

The Independent Review Panel expressed grave doubts about the reliability of the current cost estimates. While the CRC has subjected the project to a "Cost Estimate Validation Process (CEVP)", the review looked at a different design from that now proposed. In addition, there have been other significant changes to the project features since the last detailed cost estimates were prepared. In the view of the IRP, uncertainty about the constructability of the novel open web design, the much more restrictive in-water work windows, changes to the alignment across Hayden Island, and the delay in deciding the number of lanes to be built, together effectively invalidate the cost analysis done to date, and mean that cost estimates can't be relied on in putting together a funding plan.

> Until these changed conditions are considered in conjunction with the other risks included in the CEVP, the credibility of the cost basis for the project as a means for communicating the needed funding and financing is problematic.
> Using data and information in the Base Estimate and funding/finance models that are not current and accurate can lead to potential delays in the review and approval process and receipt of a ROD. However, more serious is the concern that the Base Estimate and completion dates could be potentially so significantly different from that currently incorporated into the Final EIS, that seeking the necessary financing may be complicated and/or hindered since the confidence level would be significantly lower than would otherwise be expected with a risk based estimate that is based on the conceptual design and proposal included in the Final EIS. To the extent that the Base Estimate upper range potentially increases when the inputs and assumptions are revised to reflect information contained in the rest of the package, this could have a dramatic effect on the ability to finance the project and may also seriously impact the tolling policies under discussion. (Independent Review Panel, 2010, page 168).

There are substantial risks that construction cost estimates will be exceeded. ODOT's track record in estimating the cost of large highway construction projects suggests that the actual costs of the Columbia River Crossing may be much higher than the current estimates. Consider the two largest projects underway or in the late planning stages in Oregon: the Highway 20 widening in Lincoln County, and the Newberg-Dundee Bypass.

P-061-005

Please see the response to comment P-061-004 above.

P-061-005

ODOT's largest current project—a 7-mile long rebuild of U.S. Highway 20 between Corvallis and Newport—is more than 100 percent over budget. When it was planned in 2003, the project was supposed to cost about $110 million. The original design-build contract awarded in 2005 was valued at $129.9 million. After construction problems emerged, ODOT subsequently agreed to add $47 million to the contractor's compensation. Costs have continued to increase and the project is still incomplete.

By comparison, the amount the Oregon and Washington Departments of Transportation have spent on planning the CRC (roughly $130 million) is the same order of magnitude as the original budget for the U.S. 20 widening. The construction budget for the CRC—about $3.8 billion—is more than ten times larger than the U.S. 20 widening. Despite entering into a public private partnership that was supposed to insulate it from the risks of cost-overruns, the US 20 project, originally budgeted for $110 million, is currently budgeted for more than $230 million, and will take about two years longer to complete than originally planned.

In 2003, the forecast cost of the US 20 project was $110 million.

> "The estimated cost of the Pioneer Mountain to Eddyville project is $110 million dollars (2003 dollars). Construction is anticipated to begin in 2005 and take about 4 years to complete."
> (Federal Highway Administration and Oregon Department of Transportation, 2003)

Today, the project is not complete and has expended more than $234 million—more than double the original estimate (AASHTO, 2010).

And the effect of these overruns has been to take money that would otherwise be used for other transportation projects.

> Will the cost overruns of the Highway 20 project at Pioneer Mountain affect future state highway projects? It's possible, but it's too early to tell, said a spokesman for the Oregon Department of Transportation.
>
> "The fiscal effect is unknown at this time, but we know we're going to go above the $130 million construction budget," said Joe Harwood, an ODOT spokesman in Springfield. "We have a finite amount of money. Depending on how big a hit we take ... there's a very good likelihood we'll see projects delayed. In extreme circumstances, we might see projects canceled."
> (Rollins, 2007).

The next large project in ODOT's pipeline is the Newberg-Dundee bypass. Its cost has also more than doubled as it has moved through the planning process. At the time of the Draft Environmental Impact Statement on the proposed Newberg-Dundee bypass (2003), total project costs were estimated at $222 million. Just two years later, after additional, more precise engineering analyses, the cost had ballooned 40 percent, to more than $311 million (Oregon Department of Transportation, 2005). Today, it is estimated that

P-061-005

completing this project may require between $752 and $880 million (Federal Highway Administration and Oregon Department of Transportation, 2010).

Cost overruns would jeopardize future transportation investments. It has not been determined who would be responsible for cost overruns on the Columbia River Crossing.

> "WSDOT, ODOT, C-TRAN, TriMet, and possibly the Cities of Vancouver and Portland, must prepare agreements on roles and responsibilities for project development, construction, and capital funding that address such issues as project management and decision-making, capital cost sharing, how potential cost-overruns are managed, and contracting procedures."
> (Draft Environmental Impact Statement, page 4-42)

Cost overruns are a real concern in major transportation projects in the Pacific Northwest. For the proposed deep bore replacement for Seattle's Alaskan Way Viaduct, the State Legislature required the City of Seattle to pay for any cost overruns. In the case of the Columbia River Crossing, it is clear that the additional resources would be diverted from other transportation priorities in the state and the region. And once ODOT and WSDOT have embarked on bridge construction, it is clear that completing this project—regardless of its final cost—would absorb resources that would otherwise be available for other transportation projects.

3.2 Mega-project Risk

The sheer scale of the Columbia River Crossing increases the likelihood that actual costs will be much higher than currently forecast. The CRC is a mega-project. Mega-projects are defined as major investments that cost several hundred million to several billion dollars. Careful studies of such projects around the world show that in ninety percent of such projects costs are underestimated. For bridge and tunnel projects, average cost overruns were 33.8 percent (Flyvbjerg, 2009) Mega-projects have been consistently shown to suffer from "optimism bias": the tendency of project sponsors, operating in a political environment, to overestimate benefits, and underestimate costs and risk to build public support for a massive undertaking. The CRC modeling has not considered mega-project risk.

With its official price tag of $2.6 to $3.6 billion, the CRC is more than ten times larger than ODOT's current largest construction project (the Highway 20 project mentioned above). If ODOT had a well-established track record of building multi-billion dollar highway and transit bridge projects, one could look at past experience, and estimate the probability of realizing projected costs levels (and as the Highway 20 and Newberg Dundee Bypass histories show, costs are likely to be under-estimated). The much larger size of the CRC makes it even more likely that the project will experience substantial cost overruns.

Given the scale of the project, a typical mega-project cost overrun of about 33.8 percent would work out to more than a billion dollar cost overrun.

3.3 Housing Market Distortion Risk

P-061-005

Tolling will dramatically shift the demand for housing in Clark County. The DEIS contains no analysis of the impact of tolls on housing markets in the metropolitan region. The DEIS uses the same land use patterns (distribution of households and businesses in 2030) in all scenarios, and only varies the trip distribution of these households, given that land use pattern. But imposing peak hour tolls will shift the demand for housing in Clark County and also on the Oregon side of the river.

In effect, for workers who must cross the bridge on a daily basis for work, the value of the tolls is the equivalent of a financial penalty or tax on housing on the opposite side of the river. The capitalized value of the toll penalty associated with commuting to Portland from Clark County will be equal to between $30,000 and $40,000 in housing value: a person working in Oregon could afford a house worth $40,000 more than they could afford in Clark County, once one adjusts for income lost to tolling. The same is true of the much smaller number of workers living in Oregon and working in Washington: they will find it much more attractive to buy a house in Washington, than live in Oregon.

The effect of tolling will be two-fold. First, it will tend to lower housing values in Clark County, affecting both the home equity of Clark County home owners, and tax revenues paid to local governments in Clark County. Second, it will tend to reduce the amount of commuting between Oregon and Washington. These long term effects of the "toll penalty" are not explicitly addressed in the traffic modeling for the Columbia River Crossing, which assumes a fixed distribution of households and trip attractions. Over time the toll penalty will change both the location of households and trips, and the rate of travel between the two states.

3.4 Competing Bridge and Cross Subsidy Risk

The presence of the I-205 crossing greatly complicates plans to finance the I-5 bridge with tolls. It is an open question as to whether it is financially viable or practical to only toll one of the two crossings. Because this issue has not been resolved, it constitutes a risk to successfully completing the project.

The tolling plan for the CRC has not been finally determined. One set of alternatives involves tolling both the I-5 and I-205 crossings. For traffic management and financial reasons, it may be necessary to toll both bridges. If one bridge is tolled and the other bridge is not, there is a substantial danger of very significant diversion of traffic to the non-tolled bridge, with consequent increases in congestion. In its testimony on the project, Clackamas County has formally objected to tolling only I-5 because of the negative consequences for I-205 (County Chair Lynn Peterson Letter to Independent Review Panel, May 20, 2010).

Resolving the tolling regime for I-205 is essential to finalizing financing plans for the CRC. One factor that bond underwriters consider in evaluating toll-backed bonds is the presence of competing, non-tolled facilities (Seattle-Northwest Securities Corporation &

P-061-005

Montague DeRose and Associates, 2007). The presence of a non-tolled I-205 bridge poses a significant financial risk to the holders of bonds backed by tolls on the I-5 bridge. The dangers are that the I-205 bridge would encourage substantial diversion of traffic that would otherwise cross the I-5 bridge and pay tolls, and would also greatly limit the ability to increase toll rates in the future (because increasing I-5 tolls would simply divert more traffic to I-205). These considerations prompted one Independent Review Panelist, Dr. Michael Meyers, to candidly label the failure to toll both bridges as "stupid." (Independent Review Panel Meeting, June 17, 2010). For these reasons, it is likely that bond underwriters will push strongly for tolls on I-205 as well as I-5. In the absence of tolling both bridges, bond underwriters are likely to deeply discount the amount of debt that can be issued against future I-5 toll revenues. The financial analyses prepared by the Columbia River Crossing do not address this issue.

It may not be legal for the CRC to use toll revenues from the I-205 bridge to retire debt for the construction of a new I-5 bridge. According to the Federal Highway Administration, it is not legal for a state to use toll revenues from an interstate project to pay for a different project. According to FHWA, "The Interstate System Reconstruction and Rehabilitation Pilot Program requires that revenue from tolls be used only to improve the tolled facility . . . FHWA rejected Pennsylvania's request to use the money for other projects, because ". . . the application did not meet the federal requirement that toll revenues be used exclusively for the facility being tolled" (Federal Highway Administration, 2010).

As noted in section 1 of this report, there are serious flaws in the traffic projections prepared to date. In particular, the over-estimation of traffic under current non-tolled conditions, the very high value assumed for travel time, and the decision to manually adjust traffic model outputs to shift more vehicles to the I-5 crossing all inflate estimates of toll revenue. In reality, total traffic volumes may be much less, and diversion to the I-205 bridge is likely to be much higher than CRC projections estimate.

Tolling I-205 will require specific permission from the Federal Government, and may be illegal under federal law. And if I-205 is tolled, toll revenues from that bridge may not be legally available to pay costs associated with construction of the CRC. The uncertainty surrounding the toll regime, and potential revenues available for the CRC is a major risk to the project.

P-061-005

3.5 Unconditional Guarantee Risk

The states of Oregon and Washington would likely be required to offer an unconditional guarantee to bond holders, exposing the states to the risks of revenue shortfalls and cost-overruns. For example, if the cost of the project exceeded the $3.6 billion now estimated for the revised project, the two states would be liable for these costs. If the toll revenues from the project were insufficient to repay the bonds and interest, the two states would be legally bound to divert other revenues or raise taxes to repay bond holders. The financial plan does not estimate the costs to the states from these guarantees.

The likelihood is that additional funds will be needed. As noted earlier, 90 percent of mega-projects experience cost-overruns. Other sources of revenue may fall short of targeted contributions to the project either initially or over time. Bond rating agencies are likely to say that the project will support a smaller level of borrowing than the amounts estimated by the CRC. In addition, if traffic levels fall short of forecasts, it may be impossible to generate additional toll revenues by raising toll rates, because toll increases will trigger additional diversion of traffic, and lower traffic volumes will more than offset revenue gained from higher rates. It is also possible that federal funding may be less than expected, or may arrive more slowly than anticipated. All of these events have the effect of triggering additional liability for project guarantors.

The likelihood that the states will be called upon to guarantee bond purchasers against the effects of cost-overruns and revenue shortfalls has an added negative effect on the due diligence bond purchasers would otherwise provide for the project. If their financial return is guaranteed by the full faith and credit of the two states, investors have no reason to insist on a careful review of project forecasts. Under normal circumstances, lenders will provide a valuable service by independently evaluating key project assumptions. A guarantee undercuts this added review, and in effect represents a moral hazard in the construction and operation of the project, as bond holders have no incentive to offer strong oversight of the project because they are guaranteed repayment by the state whether or not the project succeeds.

3.6 Foregone Road Pricing Revenue Risk

Establishing tolls for the I-5 bridge may foreclose the opportunity to apply road-pricing to other segments of the highway system in the Portland metropolitan area. One reason that travelers will be willing to pay a toll to use a new I-5 bridge is that they are not charged a toll for using any of the highways that lead to I-5.

For the past several years, Oregon has been investigating comprehensive systems of road pricing. The 2009 Legislature adopted HB 2001 that requires a pilot congestion pricing program in the Portland metropolitan area not later than 2012 (Section 3). As gas prices rise, and as vehicle fuel efficiency improves and as alternative fuel vehicles emerge, it is

P-061-005

apparent that the gasoline tax may need to be replaced as a means of financing the transportation system.

Tolls assessed for crossing the I-5 bridges do not solely reflect the value travelers attach to the bridge, but reflect the value of the other infrastructure that enables travel to the bridge. Once the two states start collecting in excess of $100 million per year from travelers crossing the bridge, they will find it extremely difficult to persuade users to pay additional fees for using other parts of the highway system that function as bridge approaches. Those who purchase bonds secured by toll-revenues on the I-5 bridge may want assurances that the two states do not establish tolls or road pricing on the approaches to the bridge, because this would have the effect of lowering traffic on the bridge, and also lowering the willingness of travelers to pay higher tolls over time to use the bridge.

3.7 Federal Earmark Shortfall Risk

The CRC financing plan assumes a massive and politically uncertain level of federal earmarks. The CRC has asserted that the region can expect $400 million in federal earmarks for this project, and that because of the project's alleged unique characteristics these monies will be over and above federal revenue that the region could expect to get in the future.

But this level of earmarks dwarfs what has gone to any single project. And the climate for earmarks has changed dramatically from the last transportation bill in 2005. Senator Patty Murray—chair of the transportation subcommittee of the appropriations committee—has warned against expecting big funding for this project (Hamilton, 2008).

While the public statements of the CRC imply that this project can expect some special funding, the reality is quite different. The "Corridors of the Future" program which CRC implies is a special category, is defined to include freeway mileage that carries fully one-third of the nation's traffic, and is a bureaucratically created program of the Bush Administration, funded at a total of only $66.2 million nationally (U.S. Department of Transportation, 2008).

It is apparent that that the CRC will compete for virtually every federal dollar flowing into the region. In the text of the DEIS, the CRC makes it clear that every other source of federal money flowing to Oregon and Washington for transportation is fair game for the CRC, including monies dedicated to preservation and maintenance of the highway system (DEIS, Section 4-3).

In documents released to the Independent Review Panel, it is apparent that the Columbia River Crossing will compete for existing "formula" funds that are distributed to the states, and that are available for a wide range of transportation projects (Columbia River Crossing, 2010a).

P-061-005

3.8 New Starts Funding Shortfall Risk

The project's financing plan assumes that the federal government will provide $850 million in federal transit administration funding for the construction of light rail as part of the project.

There is a $100 million discrepancy between the project budget reviewed by the Federal Transit Administration and the amount of funding projected to be received from FTA. The FY 2011 New Starts report indicates that the CRC has requested $750 million for transit (Federal Transit Administration, 2010). The funding plan CRC submitted to the Independent Review Panel indicates that the project will receive $850 million in New Starts Funding from FTA (Independent Review Panel 2010, page 173).

The project assumes a very high rate of federal match, which may not be realistic. According to the FTA, the CRC project funding assumes that federal funds will cover 79 percent of the cost of the transit portion of the CRC (Federal Transit Administration, 2010). This is the second highest level of federal match anticipated by any project; most projects are asking for federal funding of 50 percent or less. The project competes with projects in other regions, and locally, including the Portland-Milwaukie Light Rail line, which has a higher priority in the New Starts evaluation process, and which is being funded at a 50 percent level of matching.

According to the IRP, it is uncertain whether the project will successfully compete for new starts funding, and if it does, whether it will receive the requested level of funding. In its evaluation, the FTA questioned the project's local funding support and its operating cost support. As a result, the IRP concluded:

> In the FY2011 New Starts Report, FTA noted concerns relative to the assumptions affecting the capital finance plan and the operating finance. Should the New Starts ratings decrease as a result of changes in assumptions, or as a result of economic conditions, or as a result of changes in project definition, or escalation of project costs, the project's ability to maintain the Medium rating needed to advance through the New Starts process [to] secure a recommendation for a FFGA (full funding grant agreement) could be at risk.
> (Independent Review Panel, 2010, page 181).

3.9 Schedule Delay Risks

Many of the costs associated with the Columbia River Crossing are influenced by how well the project can execute scheduled tasks. There are a variety of cost risks associated with delay. In the event of price inflation, a delay can produce higher prices, for labor or for materials. Delays also have a financial cost; if project completion is delayed, then interest expense rises and net revenue from tolling will be reduced.

IMPRESA

P-061-005

The size and complexity of the Columbia River Crossing makes it difficult to accurately estimate project schedules. The record of the project's planning stages clearly illustrates these difficulties. The project has repeatedly fallen behind its stated schedule in achieving key planning milestones. For example, in December 2006, the CRC predicted it would issue a Final Environmental Impact Statement in September 2008 (Columbia River Crossing, 2006).

In May, 2009, the CRC schedule indicated that the Final Environmental Impact Statement would be issued in February, 2010 (Columbia River Crossing, 2009a).

Other special considerations make the project vulnerable to delays. Not only does the project involve managing construction in a heavily traveled interstate highway corridor, it also takes place in an environmentally significant area. The seasonal migration patterns of Columbia River Salmon—some of them listed as threatened or endangered species—require that in-water work be done only at certain times when fish are unlikely to be present. Small delays can be magnified if the project misses an opportunity to do construction in one of these available "in-water windows." According to the Independent Review Panel, the existing project schedule assumes that construction will be able to take place year-round, with no requirements to suspend in-water work during migration periods. However, it now appears that Endangered Species Act protections will require that in-water work take place only in four-month windows, rather than year-round. This seriously jeopardizes the ability of the project to be completed according to the current schedule.

> The IRP also understands that upon completion of the ESA draft that the in-water time period to perform work is a specific four-month window and there is no probability that it can potentially be eight months or even the entire year, thus severely restricting when in-water works can be performed. (Independent Review Panel, 2010, page 168).

Construction delays are a regular occurrence in such projects, as the experience with ODOT's largest current construction project, the U.S. 20 Pioneer-Mountain to Eddyville project indicates. The project is years behind schedule, having been delayed by previously unidentified geological problems, and a contractor's failure to adequately protect salmon habitat. Most recently, ODOT announced that construction is being suspended on four of the bridges that are part of the project because of concerns about geological stability. A routine examination found two bridge columns out of plumb in February, 2010, leading ODOT to suspend construction in June. It is not known when construction will resume on these bridges (Oregon Department of Transportation, 2010).

Conclusion

P-061-006

As currently proposed, this project faces three broad areas of very significant risk.

The cost of the project, as determined from CRC documents, is more than double the widely-publicized $3.6 billion construction-only costs. CRC's financial projections indicate that over thirty years, total costs of building and operating the project will exceed $8 billion dollars. Supplemental costs for related improvements, as recommended by the Independent Review Panel, will push costs to $10 billion, possibly more. Yet additional costs from potential and probable "mega-project" cost-overruns are unquantifiable.

The projected revenue from tolls is significantly overstated due to errors in the underlying traffic assumptions. These errors exaggerate expected cash-flow, and overstate the project's ability to service debt. Because no serious, independent investment grade analysis of tolling has been undertaken, the project's ability to secure favorable bond ratings and obtain the amount of debt needed is highly doubtful.

The project relies on funding from multiple federal programs, and it is highly improbable that all programs will be available, or that they will produce the optimistic levels of funding projected for each program, for the period of time that the funds will be required.

Each factor separately poses significant risk for Oregon's finances, since only the two states can fill the gaps caused by increased costs, toll revenue shortfalls, and unfavorable federal funding actions and timing. Together these risk factors compound to create virtually certain additional demands on the states' finances that have not been adequately addressed or analyzed.

Proceeding with this project based on the unreliable and highly over-optimistic work done to date exposes the region to enormous financial risks. Just as one would insist on an independent certification that the bridge's physical design was sound, decision-makers should insist that the financial plan for the Columbia River Crossing is not one which is so poorly designed that it is liable to collapse. Before taking any further steps which would commit to this risky course of action, the region's leaders should insist on a careful, professional and completely independent review of the project's financial plan.

P-061-006

This comment summarizes the above comments. Please see the responses to comments above.

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Executive Summary 1
1. CRC Traffic Forecasts Are Inaccurate 5
1.1 CRC traffic forecasts have already proven to be inaccurate 5
1.2 CRC traffic forecasts do not account for higher gas prices 9
1.3 CRC traffic forecasts are outdated 10
1.4 CRC forecasts inflated I-5 traffic estimates using "post processing" 11
1.5 CRC forecasts over-estimate the value of travel time, under-estimating toll diversion, and over-estimating revenues 11
1.6 Inaccurate toll forecasts threaten CRC financial viability 13
2. Total 30-year CRC Costs will total nearly $10 billion. 15
2.1 Construction Cost 16
2.2 Interest Cost 16
2.3 Toll Collection Cost 19
2.4 Bond Issuance Cost 19
2.5 Credit Card Cost 20
2.6 Sales Tax Cost 20
2.7 Supplemental Project Cost 20
2.8 Negative Economic Impact Costs 22
2.9 Transit Operating Costs 22
2.10 Opportunity Cost 23
3. The CRC Poses Major Financial Risks 25
3.1 Cost Overrun Risk 25
3.2 Mega-project Risk 27
3.3 Housing Market Distortion Risk 28
3.4 Competing Bridge and Cross Subsidy Risk 28
3.5 Unconditional Guarantee Risk 30
3.6 Foregone Road Pricing Revenue Risk 30
3.7 Federal Earmark Shortfall Risk 31
3.8 New Starts Funding Shortfall Risk 32
3.9 Schedule Delay Risks 32
Conclusion 34
References 35

IMPRESA

Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 8:40 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 3

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem 3
To: feedback@columbiarivercrossing.org
Unanswered excessive cost issue

P-062-001

Please do not approve this project. Here are fundamental reasons why it should be rejected:

The CRC Light Rail project fails to solve the fundamental transportation problems for our region. The most obvious bottleneck of the I-5 corridor lies 2 miles south of the Columbia River at the Rose Quarter where the freeway necks down to 2 lanes in each direction. Congestion at that location is easily verified by showing the traffic flow as displayed by Google Traffic history for the region. If a fundamental goal that the CRC project is to improve traffic flow, improve congestion, and make the I-5 safer in this region, then the CRC project misses the choke point by several miles.

Not only does the project miss the target, with much of the expense and work focusing several miles north of the river, it also fails to improve the actual bottleneck. The plan does not include fixing that most obvious chokepoint. The work north of the river does not include adding lanes and therefore wastes resources on a problem that does not exist north of the river. The problems are south of the river.

The CRC's own documentation shows that after the multi-billion dollar project is complete, the average commuter will save 1 to 2 minutes. The CRC documentation also show that the corridor will still be full and congestion will still be a problem. Instead of actual construction or freeway improvements relieving congestion, the plan calls for reducing congestion be discouraging drivers by charging tolls. This will be an especially frustrating situation for drivers who will be stuck with billions in debt, tolls in place of a freeway, and continued aggravating congestion.

It would be irresponsible to move forward with this project with such glaring red flags.

Please acknowledge receipt of this letter to:

David Madore
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1400 NE 136 Ave
Vancouver, WA 98684
cell: 360-601-3056

P-062-001

The Oregon Department of Transportation (ODOT) completed Phase I construction of the I-5 Delta Park widening project in fall 2010. Phase I of the project involved widening I-5 and lengthening the entrance and exit ramps at Victory Boulevard and Columbia Boulevard. Phase II involves improving local streets and will begin when funding is secured. Phase I of the Delta Park project widened the current 2-lane segment of southbound I-5 to 3 lanes. There are currently no immediate plans to widen I-5 south of Delta Park. Neither the CRC project nor the Delta Park projects are intended to address the southbound traffic congestion that currently exists near the I-5/I-405 split. However, traffic analyses show the congestion at the split will not be worsened because of the Columbia River Crossing project. The main reason is that fewer cars are expected to cross the river with a project in 2030 than without a project. This is due to the provision of improved transit service and tolling.

Beyond the CRC and Delta Park projects, the I-5 Transportation and Trade Partnership Final Strategic Plan recommended a comprehensive list of modal actions relating to: additional transit capacity and service; additional rail capacity; land use and land use accord; transportation demand/system management; environmental justice; additional elements and strategies (such as new river crossings); and financing. RTC and Metro are tasked with initiating recommendations as part of their regional transportation planning role. Examples of current efforts include RTC's evaluation of future high-capacity transit in Clark County, and evaluation of needs for future river crossings. Regional planners have investigated solutions to existing bottlenecks at the I-5 connections with I-405 and I-84. ODOT is responsible for conducting ongoing studies to identify other congestion problems on I-5 in Oregon that may need to be addressed in the future.

Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 9:13 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 4

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem 4
To: feedback@columbiarivercrossing.org
The NEPA Process was not followed since a 3rd bridge was wrongfully excluded

P-063-001

Please do not approve this project. Here are fundamental reasons why it should be rejected:

The CRC Light Rail project fails to solve the fundamental transportation problems for our region. The I-5 Corridor has historically included and still includes a much broader region including the I-205 and several miles east and west of the I-5 and I-205 Bridges across the Columbia River.

The region's traffic problems in the I-5 corridor are due in large part to funneling interstate traffic across only two bridges, the I-5 and the I-205. The NEPA process requires practical and appropriate fit for function solutions for the region to be seriously considered. The NEPA process was effectively voided by excluding the most obvious alternatives of constructing a 3rd bridge in the region. The exclusion is so obvious that it ignores the 20 year plans that were already adopted by the transportation authorities. Those plans show a 3rd bridge at NE 192nd Ave, 4 miles east of the Glenn Jackson Bridge and another bridge further west of the I-5 Bridge.

The exclusion of a 3rd and 4th Bridge flies in the face of common practice for cities around the US that typically include one or and two freeway rings that route traffic around the heart of cities. Yet the CRC plan does not even allow one ring to bypass the region's heaviest traffic. This is a fundamental flaw and demonstrates the shortsighted and incompetence of the planners for this project.

Not only was a 3rd bridge not properly included in the possible solutions as the NEPA process requires, but the extreme cost of this project essentially eliminates the practical possibility of constructing a 3rd bridge in the future because the CRC project consumes all available resources and adds hopeless debt that will continue to consume all available funds for at least 3 decades to come.

Adding a 3rd Bridge at NE 192nd Ave (192nd Ave Bridge), 4 miles east of the Glenn Jackson Bridge and connecting at I-84 at exit 13 would allow the already congested Glenn Jackson Bridge to be relieved. This would also relieve congestion and improve safe traffic flow along the I-5in the region due to the new route that drivers can choose as they approach the I-5 / I-205 split southbound on north of Vancouver and northbound south of Portland. As drivers approach those decision points, electronic signs can inform drivers of the approximate times to take each route.

The 192nd Ave Bridge would unload the Glenn Jackson bridge without having to create a new corridor. It simply connects the existing corridors of the I-84 and SR-14. The newly relieved

1

P-063-001

Third crossing locations were considered and dropped because they could not meet the purpose and need for the project, as described in Chapter 2 of the FEIS. Please see responses to Mr. Madore's other FEIS comment letters and the response to letter P-077 regarding bypass and new crossing options.

P-063-001

Glenn Jackson Bridge would naturally attract more drivers as they are informed of the faster I-205 from the I-5.

This most obvious solution would be lower cost and simpler that then CRC project would relieve the I-5 congestion and ensure safer more efficient traffic throughout the region. The NEPA process was not followed when this obviously more practical solution to the region's traffic needs was excluded.

It would be irresponsible to move forward with this project with such glaring red flags.

Please acknowledge receipt of this letter to

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Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 9:35 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 5

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem 5
To: feedback@columbiarivercrossing.org
The NEPA Process was not followed by failing to in a very low cost BNSF lift span

Please do not approve this project. Here are fundamental reasons why it should be rejected:

P-064-001

The existing I-5 Bridge has a lift span and a light span. The bridge operator keeps a manual log that records the date, time of each lift and the type of vessel that requested the lift. The CRC neglected to disclose that the majority of bridge typical lifts is for personal recreational sailboats with very tall masts. The NEPA process requires that all practical alternatives that can solve the major problem. This NEPA process was not followed for this project because a simple low cost program could provide sailboat owners the means to equip their sailboats with masts that can be lowered in order to clear the bridge without a lift.

Most of the time, commercial vessels can safely pass under the high span of the bridge and not require a lift. Exceptions occur sometimes when the river flow is fast. When that happens, even though those commercial vessels can fit through the high span, the fast river flow does not allow them to safely make the sharp S-curve to navigate to the BNSF railroad turnstile at the north bank of the river. A low cost solution would be to add a lift span to the BNSF railroad bridge near the center of the river. Adding that lift span (costing less than $60 million) would allow those commercial vessels to navigate a near straight line through the high span without requiring a lift. That would eliminate most lifts for commercial vessels during those fast river flow periods.

That low cost system level alternative was not included as a viable alternative as the NEPA process required.

It would be irresponsible to move forward with this project with such glaring red flags.

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P-064-001

Eliminating bridge lifts would provide a safety improvement. Relocating the BNSF railroad bridge swing span could reduce the number of times the I-5 bridge would need to lift, but it would not eliminate the need for bridge lifts. The I-5 bridge would still need to lift for regular monitoring and maintenance and for occasional taller vessels such as construction barges and high-mast recreational vessels. More importantly, simply moving the BNSF swing span, which is private property, would address only a small portion of the identified traffic safety issues, and almost none of the other stated Purpose and Need for the proposed action as described in Chapter 1 (Section 1.3) of the DEIS and FEIS.

Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 9:39 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 6

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem 6
To: feedback@columbiarivercrossing.org

P-065-001 The NEPA Process was not followed by failing to include an option without light rail

Please do not approve this project. Here are fundamental reasons why it should be rejected:

The NEPA process requires all viable alternatives to be considered for major projects. The CRC project failed to include an bridge without light rail. This is in clear violation of the NEPA process. It fails to comply with the law especially since opposition to light rail is a primary reason why Clark County residence oppose this project.

It would be irresponsible to move forward with this project with such glaring red flags.

Please acknowledge receipt of this letter to:

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cell: 360-601-3056

P-065-001

The EIS included alternatives that had bus rapid transit, rather than light rail, as the primary high capacity transit mode. Alternatives without high capacity transit were considered in the early alternatives analysis but they were unable to meet important elements of the purpose and need.

Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 9:58 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 7

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem 7
To: feedback@columbiarivercrossing.org
The NEPA Process was not followed by conducting design and studies to run concurrently

P-066-001

Please do not approve this project. Here are fundamental reasons why it should be rejected:

The NEPA process is a clear simple concise process defined by law to ensure that major projects are practical and logically proceed in a sequence that best meets the needs of citizens by evaluating all viable options before resources are consumed on design and construction plans before the vetting process selects a clear choice.

The CRC project violated the NEPA process in an unprecedented way. Except in emergency situations such as the Minneapolis bridge collapse to build the I-35W, no other project in the US has proceeded with the vetting process in parallel with the design process as the CRC project has. The reason is that it violates the intent of the NEPA process which is intended to vet all the choices first to determine which one is the best fit for function. The CRC project proceeded for 4 years consuming over $100 million with a bridge design before the alternatives were properly vetted. As a result of the haste and incompetence, the bridge design was scrapped within 4 weeks after it was made public. The violation of the NEPA process resulted in substantial loss and waste. The project should have been stopped and investigation conducted and corrective measures should have been taken to bring the project into compliance. That never happened. The project has continued to flounder as a result of improper sequences that continue to comply with the NEPA process.

It would be irresponsible to move forward with this project with such glaring red flags.

Please acknowledge receipt of this letter to:

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P-066-001

The approach was consistent with NEPA requirements. Developing some level of design for the alternatives is necessary to complete the NEPA review. The DEIS did not propose a particular bridge type. It defined the bridge in terms of vertical and horizontal parameters, capacity, and pier configuration. Some potential bridge types were conceptualized early and those were shown to the public. Well after the DEIS was issued, one bridge type (open web box) emerged as the likely preferred approach. The Bridge Expert Review Panel recommended that the project instead select one of three other bridge types, which the project did (selecting a composite deck truss). The composite deck truss bridge type fits within the parameters of the design and impacts evaluated in the DEIS, and was one of the bridge types that had been considered earlier in the process. The bridge type evaluation process is described in Chapter 2 of the FEIS.

Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 10:16 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 8

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem 8
To: feedback@columbiarivercrossing.org
The NEPA violated obvious logic for political reasons

Please do not approve this project. Here are fundamental reasons why it should be rejected:

P-067-001

The CRC was based on obvious fallacious logic by adopting a solution that was clearly violated common sense.

Years ago, we could have started a $5 billion experiment. Rather than spending 1/10 of that cost to widen their freeways, Portland could construct light rail on a grand scale throughout their city to relieve their traffic congestion. They could build a blue line, red line, a green line, and a yellow line.

They could clearly prove beyond a shadow of a doubt that spending gas taxes on light rail instead of highways would obviously solve their congestion problem.

When the I-205 was constructed, Glenn Jackson left a wide swath of green grass in the middle, enough to add multiple lanes in each direction to accommodate future demand and relieve congestion as needed. The experiment could include consuming that space with light rail instead. As Clark County drivers entered Portland, they could zip through congestion free and celebrate the success of the light rail experiment. Or they could sit there in stop and go traffic congestion with plenty of time to evaluate the failure of the experiment. In time, real world results would speak for itself.

Welcome to the year 2011 when we are clearly in a position to objectively evaluate Portland's $5 billion experiment. The $5 billion question is this: Has light rail solved their congestion problem? Is their traffic congestion much better or much worse than Clark County, where zero dollars were spent on light rail?

If light rail solved Portland's congestion problem, then Clark County should catch up and invest billions to bring it to our side of the river. If Portland's traffic congestion is a disaster, then wouldn't we be blind fools to squander our gas taxes on such a boondoggle in Clark County? After all, who could argue with a real world $5 billion experiment?

It would be irresponsible to move forward with this project with such glaring red flags.

Please acknowledge receipt of this letter to:

David Madore

1

P-067-001

Light rail transit alone is not intended to address the congestion-related need defined for the CRC project. Modeling indicates that some trips will shift from auto to transit, some trips will not be taken because of the toll, and highway improvements will provide additional congestion reduction.

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Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 10:26 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 9

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem 9
To: feedback@columbiarivercrossing.org
The CRC Project has many symptoms that indicate the high likelihood of organized crime

P-068-001

Please do not approve this project. Here are fundamental reasons why it should be rejected:

Forensic Accountant Tiffany Couch has investigated and found numerous red flags indicative of fraud, corruption and organized crime. Her credentials as a nationally respected expert in the field of fraud and corruption, as well as her experience as an investigator and instructor speak of her competence. The mismanagement and the failure for the CRC project staff to account for over $15 million indicate that an investigation is in order and the project should held until a thorough investigation can be conducted to determine if organized crime is involved in this project.

It would be irresponsible to move forward with this project with such glaring red flags.

Please acknowledge receipt of this letter to:

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Vancouver, WA 98684
cell: 360-601-3056

P-068-001

The Record of Decision concludes the environmental, and alternatives analysis. It indicates which alternative has been selected by the federal government, and allows for the continued design and eventual construction of that alternative. The Locally Preferred Alternative is supported by local, regional, state, and federal agencies and has been selected following an exhaustive analysis and public involvement program.

The project takes the issues of financial management very seriously. Project staff have provided Ms. Couch and Mr. Madore with considerable records and reports and has responded to their inquiries. The project is currently developing new financial reporting mechanisms and has started providing monthly reports on the web. The project will continue to work with the public to improve transparency and an understanding of the resources required for an undertaking of this scale.

Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 10:30 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 10

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem 10
To: feedback@columbiarivercrossing.org
The NEPA Process was not followed

P-069-001

Please do not approve this project. Here are fundamental reasons why it should be rejected:

The NEPA process requires that the FEIS approval process is to include public testimony and allow the public to have a voice in the process. The public was not allowed to have a voice in that process at the Vancouver City Council meeting or at the C-Tran meeting where the board members voted to give their final approval to this project.

It would be irresponsible to move forward with this project with such glaring red flags.

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P-069-001

The National Environmental Policy Act (NEPA) and its regulations do not require a public hearing on a Final EIS (FEIS). Comments on the FEIS were accepted for more than 30 days following its availability and four public meetings were held during that period to provide opportunities for the public to comment and ask questions.

Any concerns about procedures at C-TRAN Board meetings or City of Vancouver Council meetings should be addressed with those agencies.

Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 10:35 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 11

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem 11
To: feedback@columbiarivercrossing.org
No funding for light rail operations and maintenance

Please do not approve this project. Here are fundamental reasons why it should be rejected:

P-070-001 The CRC project includes the construction of light rail. Yet this project has no provision for funding the operation and maintenance of light rail. A vote is promised for next year. Clark County has had 2 light rail votes in the past and both failed. There is still a strong opposition to light rail. A vote for light rail O&M next year is likely to be fail again. Current law does not allow tolls to be used for light rail. It would be poor stewardship to construct a light rail line that has no funds to operate it. It is a fundamental flaw that calls for this project to remain unapproved as long as no O&M funds are available to fund light rail.

It would be irresponsible to move forward with this project with such glaring red flags.

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P-070-001

A public vote on funding for C-TRAN's portion of the light rail operations is anticipated for 2012.

From: Martin_Thomas [mailto:martt906@hsd.k12.or.us]
Sent: Friday, October 07, 2011 2:46 PM
To: Columbia River Crossing
Subject:

P-071-001

Hi, my name is Tommy martin from century high school and I'm doing a research paper on the CRC and was wondering if the febery,23 draft of the 17th street max line draft was the final draft for the line, and if not I was wondering if It was possible to get the final copy of the draft for the paper.

P-071-001

Mr. Martin received a response from CRC staff on October 11, 2011.

Hines, Maurice

From: Kathleen Meunier [kmeunier1@aol.com]
Sent: Sunday, October 23, 2011 6:20 PM
To: Columbia River Crossing
Subject: feis comments
Attachments: Mom_CRC_comments-1.odt

document is attached and below.

P-072-001

As a physician I am deeply concerned about the health consequences that will be suffered by the residents of Hayden Island Manufactured Home Community (HIMHC) if the CRC project goes forward as proposed in the FEIS.

The residents of the HIMHC are of low income. It is well documented that low income populations are less healthy than wealthy communities. Less healthy individuals are more likely to become ill and/or die when exposed to threats to their health, than healthier persons. More low income residents will become ill and/or die when their health is threatened than would a healthier wealthier community.

The residents of the HIMHC are primarily elderly, 60% are 65 years or older. The community also includes about 100 children. It is well documented that the segments of society most likely to become ill and/or die when their health is challenged are the young and the old. A threat to health that the general population can tolerate with minor transitory diminished health, can kill the young and the old.

The HIMHC residents compound the intolerance for health risks known to be found in low income populations as well as the intolerance for health risks known for the young and old segments of society. A low income population which is also composed of the elderly, as well as children, maximizes the inability of the group to tolerate challenges to their health without suffering illness and death.

In the HIMHC, in addition to the well documented diminished capacity to tolerate health challenges found in the low income populations as well as found in the young and old segments of society, there is already established illness present, including those with respiratory illness, so severe they are already requiring home supplemental oxygen treatment. The HIMHC residents are not a typical community and are not adequately protected by mandated minimum environmental standards.

The CRC would be hard pressed to find a population more at risk to suffer significant adverse consequences from the CRC construction than the HIMHC. Members of the HIMHC will become ill and die if the CRC project proceeds as planned, especially if it uses the Thunderbird Hotel site, which is immediately adjacent to the HIMHC.

Standards for air quality, and other environmental factors assume a typical demographic which has the capacity to withstand health challenges. The CRC is choosing to site the project directly impacting a low income community of the young and old with preexisting significant illnesses and physical limitations, the HIMHC. Therefore the allowable air quality and other environmental factors must be tailored to the much much stricter criteria of what a low income young and/or old person with preexisting significant illness can tolerate without increased ill health. Either the project should be maximally moved away from the known location of these low income young and old or the CRC should be held to meet strict environmental standards that a low income young and/or old person with preexisting illness can tolerate without increased ill health.

There are alternatives, rather than what the CRC proposes, which would move the main construction away from the HIMHC, a community which will suffer significant adverse outcomes, including death, disproportionate to what virtually any other population would experience if exposed to the same assault to their health and well-being. An example of such an option is Jim Howell's "Common Sense Alternative."

The threat to the health and well-being of the HIMHC is not limited to the decrease in air quality, the noise and vibration, the disruption of utilities in a population uniquely dependent on access to utilities for the

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P-072-001

You have asserted that if the CRC project proceeds as planned it will result in the illness and death of some residents of the Hayden Island mobile home community. The analysis of air quality, noise, and other impacts that can affect health indicate that the project will not result in any violations of air quality standards, can mitigate most long-term noise impacts (to fewer noise impacts than occur under existing conditions), and can keep construction-related air and noise impacts below standards established to protect human health. You note that a larger threat to health from the project is chronic stress. The effects of the project on chronic stress of residents were not specifically evaluated for the FEIS. However, the project has committed to staging construction and mitigating construction impacts as much as practicable (measures are listed in the FEIS and in the mitigation commitments included in the ROD) in order to minimize disturbance and inconvenience to nearby residents.

P-072-001

operation of medical equipment. The larger threat to the health, well-being and lives of the HIMHC residents as a direct result of the CRC project are the well documented significant adverse health consequences of chronic stress. Chronic stress increases the atherosclerotic plaques of vascular disease. Vascular disease is the #1 cause of death in the United States of America. Chronic stress depresses the immune system, reducing a person's ability to resist infection and cancer. Chronic stress increases irritability which correlates with isolation which correlates with decreased health. Chronic stress correlates with shallow respirations which decrease oxygenation as well as leaving the dependent portions of the lung unexpanded and therefore predisposed to developing pneumonia. Pneumonia frequently results in death in elderly people. The chronically stressed person holds him/herself more stiffly and is less able to concentrate. The chronically stressed elderly person is more likely to fall and break their hip. There is a high incident of death in the six months following a hip fracture suffered from an elderly person.

80-90% of patient visits to a primary care doctor are regarding stress related symptoms. Chronic stress is a very real threat to health and well-being. The very real significant adverse and well documented consequences of chronic stress will be especially devastating to the residents of HIMHC as they have the diminished capacity to tolerate challenges to their already fragile health status being of the compounded high risk groups of low income and the elderly and/or young.

The intensity of adverse health consequences of chronic stress correlates with a person's sense of powerlessness. The poor and the elderly and the young lack a sense of power. The CRC has made it clear they do not regard the HIMHC as having any real input into the CRC project thereby maximizing chronic stress in the HIMHC.

What the CRC proposes would subject the HIMHC's fragile citizens to at least 10 additional years of unrelenting high chronic stress. Many will become ill. Many will die. Illness and death that will happen as a direct result if the CRC project goes ahead as planned.
The CRC should have to acknowledge and adequately accommodate the fragile health of HIMHC or move their project distant from this endangered low income elderly community.

The CRC should acknowledge the highly toxic consequences of chronic stress and that the CRC project has been posing a very real threat to the health of HIMHC residents for several years already by invoking chronic stress in the HIMHC residents. The CRC should immediately being offering weekly sessions on abating the consequences of chronic stress that are taught at HIMHC by qualified instructors on a variety of practical techniques that can decrease the highly adverse health impacts the CRC is already inflicting on this low income elderly population.

There are alternatives to what the CRC is proposing. There is no necessity to cause avoidable illness and death in a low income elderly population. If a wealthy community was situated where the HIMHC is situated, the site would never have ever been considered. Don't we have laws about not taking advantage of disadvantages groups like the poor and the elderly? Shouldn't they apply here?

I am deeply concerned.

Sincerely,

Kathleen Meunier, M.D.

P-072-001

As a physician I am deeply concerned about the health consequences that will be suffered by the residents of Hayden Island Manufactured Home Community (HIMHC) if the CRC project goes forward as proposed in the FEIS.

The residents of the HIMHC are of low income. It is well documented that low income populations are less healthy than wealthy communities. Less healthy individuals are more likely to become ill and/or die when exposed to threats to their health, than healthier persons. More low income residents will become ill and/or die when their health is threatened than would a healthier wealthier community.

The residents of the HIMHC are primarily elderly, 60% are 65 years or older. The community also includes about 100 children. It is well documented that the segments of society most likely to become ill and/or die when their health is challenged are the young and the old. A threat to health that the general population can tolerate with minor transitory diminished health, can kill the young and the old.

The HIMHC residents compound the intolerance for health risks known to be found in low income populations as well as the intolerance for health risks known for the young and old segments of society. A low income population which is also composed of the elderly, as well as children, maximizes the inability of the group to tolerate challenges to their health without suffering illness and death.

In the HIMHC, in addition to the well documented diminished capacity to tolerate health challenges found in the low income populations as well as found in the young and old segments of society, there is already established illness present, including those with respiratory illness, so severe they are already requiring home supplemental oxygen treatment. The HIMHC residents are not a typical community and are not adequately protected by mandated minimum environmental standards.

The CRC would be hard pressed to find a population more at risk to suffer significant adverse consequences from the CRC construction than the HIMHC. Members of the HIMHC will become ill and die if the CRC project proceeds as planned, especially if it uses the Thunderbird Hotel site, which is immediately adjacent to the HIMHC.

Standards for air quality, and other environmental factors assume a typical demographic which has the capacity to withstand health challenges. The CRC is choosing to site the project directly impacting a low income community of the young and old with preexisting significant illnesses and physical limitations, the HIMHC. Therefore the allowable air quality and other environmental factors must be tailored to the much much stricter criteria of what a low income young and/or old person with preexisting significant illness can tolerate without increased ill health. Either the project should be maximally moved away from the known location of these low income young and old or the CRC should be held to meet strict environmental standards that a low income young and/or old person with preexisting illness can tolerate without increased ill health.

There are alternatives, rather than what the CRC proposes, which would move the main construction away from the HIMHC, a community which will suffer significant adverse outcomes, including death, disproportionate to what virtually any other population would experience if exposed to the same assault to their health and well-being. An example of such an option is Jim Howell's "Common Sense Alternative."

The threat to the health and well-being of the HIMHC is not limited to the decrease in air quality, the noise and vibration, the disruption of utilities in a population uniquely dependent on access to utilities for the operation of medical equipment. The larger threat to the health, well-

P-072-001

being and lives of the HIMHC residents as a direct result of the CRC project are the well documented significant adverse health consequences of chronic stress. Chronic stress increases the atherosclerotic plaques of vascular disease. Vascular disease is the #1 cause of death in the United States of America. Chronic stress depresses the immune system, reducing a person's ability to resist infection and cancer. Chronic stress increases irritability which correlates with isolation which correlates with decreased health. Chronic stress correlates with shallow respirations which decrease oxygenation as well as leaving the dependent portions of the lung unexpanded and therefore predisposed to developing pneumonia. Pneumonia frequently results in death in elderly people. The chronically stressed person holds themself more stiffly and is less able to concentrate. The chronically stressed elderly person is more likely to fall and break their hip. There is a high incident of death in the six months following a hip fracture suffered from an elderly person.

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I am deeply concerned.

Sincerely,

Kathleen Meunier, M.D.

Hines, Maurice

From: Kelly Meunier [kmeunier@willamette.edu]
Sent: Sunday, October 23, 2011 2:44 PM
To: Columbia River Crossing
Subject: Final Environmental Impact Statement comments
Attachments: Kelly CRC comments.docx

P-073-001

Attached and below are my comments to the FEIS.

HIMHC – Hayden Island Manufactured Home Community – on western Hayden Island

EJ – Environmental Justice Community

FEIS – Final Environmental Impact Statement

CRC – Columbia River Crossing

NEPA – National Environmental Policy Act

EO - Presidential Executive Order 12898

LPA – Locally Preferred Alternative

GHG – Green House Gases

Hot Spot – testing for carbon monoxide and particulate matter

NPDES – National Pollutant Discharge Elimination System

As a resident of Portland it is unavoidably clear to me that Hayden Island Manufactured Home Community (HIMHC) qualifies as an environmental justice (EJ) community. HIMHC is a low income community, predominately composed of elderly residents on social security as well as approximately 100 children. The methodology used by the CRC to determine the demographic characteristic of HIMHC was undeniably different from the rest of the areas evaluated by the CRC. CRC intentionally chose a different methodology when looking for low income in Oregon (census tracks) than in Vancouver (block groups). Interestingly, CRC used block group data when looking to see if minorities were disproportionately impacted in both Oregon and Washington. It seems that CRC uses whatever methodology gives the desired results.

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P-073-001

The demographic data presented for the Hayden Island Neighborhood in Chapter 3 (Section 3.5) of the DEIS was taken from the 2000 U.S. Census and cut to the neighborhood boundaries. The U.S. Census estimated a total of 2,071 residents on the Island, which is in-line with the population estimate of 2,155 residents conducted in 2007 by the City of Portland for the Hayden Island Planning process. In an effort to more accurately reflect the Island population, the FEIS assessment is based on data from the 2010 Census, the American Community Survey, and a project-specific survey of potentially displaced households. Updated population and demographic information can be found in Chapter 3 (Section 3.5) of the FEIS.

The displacement survey (which focused on the most directly impacted households) was undertaken in response to assertions that the Census data misrepresented the affected community. The U.S. Census data indicate that, as a whole, the Hayden Island neighborhood has a lower proportion of minority and low income households than in the City of Portland, Multnomah County, or in the project study area. Hayden Island ranks near the lower end of the spectrum in both minority and low income household composition when compared with all other neighborhoods in the study area. Households within the Hayden Island Manufactured Home Community (HIMHC) were not surveyed; but these households also will not be displaced. There are many neighborhoods within the study area that will be adjacent to construction and impacted by construction activities. Many of these neighborhoods will also be directly impacted by residential displacements, although there will be no households displaced from the HIMHC. The project has not found that the impacts experienced by residents of the HIMHC would be disproportionately more severe than those experienced elsewhere in the project area. However, the project recognizes that there are low income and minority households on Hayden Island. And the project will remain open to the potential for specific, vulnerable populations to be present in

P-073-001

Executive Orders 12898 and 12948, requires each federal agency to make achieving environmental justice part of its mission "by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

Based on EO 12898 and NEPA requirements the CRC is obligated to determine low income and minority populations within the project area that will be disproportionately and highly adversely affected. Low income and minorities populations tend to cluster. The sample size used to determine low income or minority populations, if constructed to include only a portion of the population concerned or made sufficiently large to include non-pertinent populations, will deliberately obscure the identification of a true environmental justice community. The use of census track data instead of block group data on Hayden Island gives the appearance of a blatant effort by the CRC to mask what is undoubtedly an environmental justice community, HIMHC, within the project area.

The CRC's arbitrarily narrowed drawing of the project boundaries again gives the appearance of a deliberate effort to exclude additional environmental justice communities that are well-known to be present within the North Portland area. Moreover, clearly the environmental impact of this project will not only effect the very narrowly CRC identified corridor/parameters, but will further extend into the North Portland area that is home to minority and low income populations.

It is my stance that NEPA requires CRC to make a good faith effort to meet the requirements of EO 12898. This requires CRC to accurately evaluate the project area by not only considering direct impacts of construction on the immediate surrounding area but also to consider air quality impacts which will affect a greater area. North Portland which is currently surrounded by the filth of highway pollution, pollution from waste facilities, toxins from industrial facilities, I-205 which is home to a growing minority population as they are being economically forced from inner NE Portland, I-84 which is already heavily congested will have even greater congestion as a result of this project, are being completely excluded from the DEIS and FEIS when evaluating CRC's environmental impact. **This is gerrymandering.**

Using a census track to determine low income in Oregon instead of block group data, which was used for all other EJ testing, shows a conscious intent on CRC's part to masks the true nature of the HIMHC community. Portland has a higher cost of living than some other states, so

the HIMHC. The project has worked closely with the community on Hayden Island to identify unique impacts and develop mitigation. The implementing federal and state guidelines on Environmental Justice have and will guide the project's consideration of, outreach to, and mitigation of impacts for these households.

P-073-001

using the federal poverty line is absolutely inappropriate as a comparison. HIMHC is significantly low-income relative to the City and County median household income. Even using the inapplicable comparison of the federal poverty line, if a proper income survey was done at HIMHC it would have been unavoidably clear that HIMHC is a low income community qualifying for environmental justice status. HIMHC was not surveyed, although such a survey was done in other communities. Being a low income community means that HIMHC deserves environmental justice (EJ) status under NEPA. The FEIS failed to identify HIMHC as an environmental justice community. **This is gerrymandering**. HIMHC is due EJ status and all the protections that come with it. Until CRC makes HIMHC an EJ community it is in clear violation of NEPA requirements.

The DEIS and FEIS exemplify CRC's effort to manipulate data and statistics so as to exclude valid environmental justice communities within the project area, if it were properly drawn. Do not let them get away with it by approving this inefficient, grossly overpriced project that will harm Oregon and Washington, both economically and socially. I vehemently oppose the CRC project in its current form. The CRC project in its current form is unnecessary and it ignores the decrease in traffic and most importantly ignores the will of the people. We want more bridges, more options over the river, save money not spend in a bad economy, we need better schools, better paid teachers, earthquake upgrades for all bridges in Portland not just I-5. We want improved public transportation. Re-working I-5 is the least of our concerns. There is more than one way to fix the congestion on the I-5 bridge. Please do not approve this project and force Oregonians and Washingtonians to pay a 10 billion dollar bill that we the tax payers will have to pay. I want better schools not a big fancy bridge that will simply displace congestion from the Columbia River to the downtown Portland I-84 area. This project does not resolve the bottleneck traffic problem; it just moves it further south. Downtown Portland already has harmful levels of pollution in the air and this project will only exacerbate our air quality. Additionally, this bridge will have the exact same problem in 30 years. Construction will take 10 years. It is not worth it.

Financially the CRC project is not worth it. Ethically what CRC is doing is wrong. The financial, emotional, psychological, physical, and livability impact that will be suffered by HIMHC is disproportionate, highly adverse and appreciably more severe than to the residents of the rest of the project area.

P-073-001 Low income populations, as a group, have poorer health than wealthy communities. As a result of this less sound state of health, they suffer ill health and death from challenges that more healthy populations can tolerate. Ill health and death are significant adverse impacts.

The very old and very young are the segments of society that are most likely to become ill and or die from health challenges that the majority of the population can tolerate.

The HIMHC compounds the fragile health risks of low income as well as those of the very old and the very young. The HIMHC is a high risk group for significant adverse impacts from health challenges. This is a community most likely to suffer appreciably more injury from; expose to toxic substances, decreased air quality, the chronic stress incurred by on-going noise and vibration insults to their known lesser capacity to tolerate such exposure. **This is the type of community most likely to suffer ill health and probable death as a direct consequence of the impact of the CRC project**. Every effort should be made to move every aspect of the CRC project as far away from HIMHC community as possible and to maximize mitigation efforts.

The HIMHC residents now live in a relatively tranquil environment with fresher air from the Columbia air currents. However, polluters on the river and onshore currently harm Hayden Island air quality. Once CRC construction starts, HIMHC's living environment will change dramatically and make their environment one of on-going noise, vibration, and air polluted with particles and toxic substances. Instead of a health supporting, tranquil environment, it will become an environment of on-going, inescapable chronic stress; both psychological as well as in the form of more direct physical health challenges. The combination of on-going mental psychological stress and known physical toxic exposure on a population already at high risk for significant adverse impact to health challenges makes it a foregone conclusion that decrease in well-being, ill health, and probable death will occur in this select population if the CRC project proceeds as planned (stages at Thunderbird hotel). Despite awareness of the illness that will result in the HIMHC as a direct result of CRC construction, the CRC plans would also limit this community's timely access to emergency vehicles during the CRC project. **How can the CRC have such blatant disregard for the lives and well-being of this segment of society?**

The significant adverse impact suffered by the residents of the HIMHC is an obvious predictable consequence. It cannot be claimed to be unforeseen. Knowing the unacceptable significant adverse impact the HIMHC residents will predictably suffer; the onus is on the CRC to earnestly explore other alternatives with less impact on this fragile community. One option

P-073-001

that would seem to minimize the HIMHC exposure is Jim Howell's common sense alternative option. The common sense alternative by Jim Howell is a 6 minute YouTube video, watch it.

Below are known concerns of HIMHC that have been knowingly overlooked. I have been present at CRC Q&A sessions and it disgusted me to watch CRC people answer questions with an evasive and non-responsive answer. It was offensive and it demeaned members of the HIMHC community's valid concerns. Inability to be "plain and concise" in person just shows that CRC, in person as well as in the DEIS and FEIS failed to be "plain and concise" another violation of NEPA. How many times can CRC violate NEPA and still be approved?

P-073-002

A. SAFEWAY CONCERNS

- It is critical for the health of the low income residents of HIMHC to have fresh food available within walking distance. The only store that meets this requirement is the existing Safeway. 30% of HIMHC residents do not drive, 60% are 65 or older, several require mobility assistance (walker/wheelchair) and therefore cannot walk far. Removing the Safeway will have a highly adverse and disproportionate impact on the well-being of HIMHC.

- The alternative grocery stores listed in the FEIS are all several miles away and are not accessible to a non-mobile community. The FEIS states that people with disabilities or mobility limitations that live near Safeway will suffer a greater impact because they will have to travel farther to get fresh food. The projected transportation improvements do not address or acknowledge the financial and physical limitations of this low income community. These alternatives are 4 miles away, which means that an elderly disabled resident will travel roundtrip over 8 miles, heavy bags in hand to gain access to vital resources like fresh vegetable, meats and fruits.

Below are the FEIS listed alternatives that are unacceptable and do not mitigate:

- Cash in Carry is for restaurants and only sells in bulk
- Fred Meyers in Vancouver – 4 miles away and requires residents to pay a toll.
- New Seasons – 3.6 miles = expensive

5

P-073-002

The project has endeavored to avoid the displacement of any business, although it is not possible to do so within the densely developed corridor. The project will continue to look for ways in which impacts can be minimized and avoided. The displacement of Safeway is documented in the FEIS. Mitigation for this impact is governed by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended). The project will suggest that Safeway relocate on Hayden Island, but cannot require them to relocate in any specific location. Relocation decisions are business decisions that will be made by Safeway.

There is currently a Target store being built on the island, and this store will include both groceries and a pharmacy.

P-073-002

- Fred Meyers 3.9 Miles – 4 miles, each way = 8 miles carrying heavy food
- Home delivery= expensive= requires internet, computer, credit card, bank account
- A store equivalent to Safeway, within walking distance of an elderly population must be maintained. Improving vehicle mobility from the island does not help people who depend on walking to get their groceries.

- The FEIS claims that grocery store delivery service is an acceptable mitigation to the loss of Safeway. This alternative presumes the financial resources to be able to afford a computer, the monthly internet fees, a bank account, good credit, a credit card and money to pay for a home delivery fee. This alternative is expensive and completely ignores the financial reality and limitations of HIMHC. This is not an acceptable form of mitigation

- Taking away access to fresh food from a low income community of elderly, disabled residents, and children is a direct assault on the health of HIMHC, a population already at risk. The cost of ill health is the largest drain on U.S. economy. It is clearly not in the best interests of the public to promote ill health, especially to children and elderly citizens. HIMHC will suffer a disproportionate impact compared to other communities specifically because this community is composed primarily of the very young and very old who are the most vulnerable segments of society.

- At the end of section 3.5, under question 2 it states "Does the project affect a resource that is especially important to a low income population" FEIS answered no. The FEIS is wrong. HIMHC residents have continually vocalized concern about losing access to the only on island location for fresh fruit, meats, and veggies; Safeway. The fragile health of HIMHC will suffer a disproportionate impact if denied fresh food. The very young and very old are less able to respond to challenges to their health. The harm ranges from vitamin deficiencies, diminished capacity to healing from surgery, and diminished capacity to fight infections including even the common cold which will in some instances progress to pneumonia and death.

- At the end of 3.5, Question 4 "would the project result in disproportionately high and adverse impacts on a low income population that would be appreciably more severe or greater in magnitude than the impact that would be suffered by non-minority and non-low income populations?" FEIS answered no. FEIS is wrong. The more affluent, eastern side of Hayden Island can get their groceries delivered. The western side is poor. It is well documented that the poor have less vigorous health. Moreover, HIMHC is composed of children and the elderly, which again are the well documented segments of society most at risk from health challenges. This is a population least able to tolerate inability to have access to fresh food. Therefore there is no doubt that HIMHC will have a highly adverse

P-073-002

and suffer a disproportionate impact if their health is further diminished by removing access to fresh foods.

- FEIS lists a Washington Fred Meyer's location as mitigation for the loss of the Safeway. Shopping at this location would force HIMHC residents to travel over 8 miles round trip and pay a toll. Is it unreasonable to expect HIMHC, a low income community to pay a toll every time they need fresh produce and meat.

P-073-003

B. BRIDGE & UTILITIES

- 60% of the residents of HIMHC are 65 or older. In order to avoid a highly adverse and disparate impact against this population the local access bridge must be built in the first phase of the project to ensure efficient emergency access.

  The residents of HIMHC are older, in poorer health in comparison to the general population and thus will have a greater need for rapid access to emergency vehicle medical care. Every second counts for heart and brain injuries. **Any delay in the arrival of medical emergency vehicles will result in permanent injuries and potentially death.** Not only is it morally irresponsible, it is fiscally irresponsible because due to preventable delay in timely access to emergency medical care a greater number of elderly individuals will no longer be able to live independently and will be force to shift to state supported living facilities. This is a hidden cost that must be publicly addressed, in terms of not only dollars, but loss of life, quality of life, and autonomy. Initial construction of the local access bridge to Hayden Island to allow timely rescue and removal by emergencies vehicles is vital to the health and safety of HIMHC. Option A of the LPA, the local access bridge to Hayden Island must be built in the first phase of CRC construction.

- The FEIS included an LPA "option B" which does not provide a local access bridge to Hayden Island. Option B was not included in any alternatives presented in the DEIS and thus excluded the public from discussion and participation regarding the option, contrary to the requirements of NEPA.

- On 10/20/2011 Nancy Body did a question and answer session with HIMHC residents. In this discussion it became alarming clear that LPA Option A is not in any way the committed choice for CRC construction. **It is unacceptable that CRC has not made a commitment on the bridge design when releasing the FEIS**. Giving the public 30 days to comment is abhorrently meaningless when the real decisions are made after the close of the comment period thus eliminating any opportunity for community input on the CRC design. The CRC project is stated to be for the benefit of the public and it is

7

P-073-003

The project is eager to work with emergency service and utility providers as the design for the LPA and the approach to construction is further refined. The project has already made commitments to maintaining 3 through lanes, and to construction-period transit enhancements. The possibility of early construction of the local multimodal bridge will continue to be a consideration by the project as project sequencing is refined. Although it is not appropriate to describe the early construction as mitigation, it is discussed as something we will explore as we further refine construction staging. Specifically Section 2.3.1 of the FEIS states:

> Similarly, the Marine Drive interchange construction would need to be coordinated with construction of the southbound lanes coming from Vancouver. While this interchange can be constructed independently from the work described above, the completion and utilization of the ramp system between Hayden Island and Marine Drive requires the work to occur in the same period. Early construction of the local multimodal bridge between Marine Drive and Hayden Island, so that it can be used as an alternate access route during the remaining construction period, will be analyzed during final design. The interchange reconstruction also needs to occur so that Marine Drive can be elevated, allowing the light rail extension to cross under Marine Drive. The Marine Drive interchange is expected to take a little more than 3 years to construct, including work at the Victory Boulevard interchange.

P-073-003

counterintuitive to ignore and remove the public's ability to participate. The public is footing the bill and their input must be directly and satisfactorily addressed.

- The FEIS failed to inform HIMHC that during construction their vital utilities, such as water, sewer, and electricity will be shut off for indeterminate amounts of time. This reality was not in the DEIS or any other document previous to the release of the FEIS. It is unacceptable that CRC did not explore the potential consequences to a population with fragile health, of elderly residents and children. The loss of these vital utilities, even temporarily could potentially have a dire effect. The onus is on the CRC to explore and then mitigate the shutdown of these utilities. Without knowing the current and foreseeable future medical equipment needs in this population CRC cannot determine if any interruption in utilities can be tolerated by HIMHC.

  Did CRC consider that HIMHC residents might use breath apnea machines, run oxygen tanks, kidney machines for home dialysis, using IV medications (morphine pump, or medicinal pump that needs to stay plugged in), or have babies with SIDS – sudden infant death syndrome? Older people use monitors in case they fall; this signal is weak and needs electricity or phone lines to work effectively.

- The CRC acknowledges in the FEIS that it is "especially aware of the sensitive circumstances on Hayden Island" in regards to the shut off of vital utilities. It is knowable that there will be increased illness and death in the HIMHC community as a direct result of the CRC project; Illness and death that would not necessarily occur in a more typical demographic population. CRC has made no commitment nor any statement at all in the FEIS as to what mitigation will be undertaken by CRC to ensure the health and well-being of HIMHC while their vital utilities are shutoff. CRC has not mentioned any financial responsibility in the FEIS as to any mitigation that will be required to protect this community, such as generators or water tanks. The CRC has acknowledges a highly adverse and disparate impact on HIMHC. NEPA requires mitigation steps be taken. Merely acknowledging the hardship the CRC will place on HIMHC is not mitigation. The FEIS is deficient because it fails to state how it will mitigate against the loss of vital utilities.

- **The FEIS does not acknowledge or quantify the illness and death it will cause in an elderly population, in particular HIMHC, as a direct consequence of the project.**

P-073-004

C. AIR QUALITY MONITORING

- A definitive staging site was **not** selected in the FEIS. The FEIS cannot accurately determine the effects to air quality and health consequences to local residents without

8

P-073-004

The project is considering different contracting methods, and which specific bridges, roadways, etc., will be part of each contract. There are five possible staging areas identified in the FEIS. These staging areas could be used by a contractor, or they may choose their own. This is typical during the planning and NEPA environmental impact assessment stage. A contractor will determine the exact activities that will occur on any of these sites, or any other site to be used for staging or casting. The contractor, working closely with the DOTs, will need to ensure compliance with NEPA and any other applicable federal, state and local regulations.

The project did assess and report the greenhouse gas emissions from the project. The FEIS also provides considerable detail about other emissions and air quality impacts. The air quality evaluation presented in the DEIS assessed how emissions would be expected to change by 2030 and how the project would affect emissions of pollutants regulated by state and federal standards as well as vehicle emissions that are not regulated. Oregon and Washington, as well as the federal government, have established ambient air quality standards for criteria pollutants. These standards are based on human health risks. The DEIS evaluation included an analysis demonstrating that the CRC project would allow the region to retain conformity with state and federal air quality standards for relevant criteria pollutants. See the Air Quality Technical Report for a detailed explanation of the state and federal regulations concerning air quality and the evaluation of how the project complies with relevant air quality regulations. See Section 3.10 of the FEIS for an updated explanation of the pollutants regulated by state and federal law.

The DEIS also evaluated how the project alternatives would affect emissions of mobile source air toxins (MSATs) from I-5 traffic. MSAT emissions from vehicles are not currently regulated. The evaluation in the DEIS found "that future (no-build or build) emissions of all pollutants

P-073-004

specifying where the CRC will be bringing and introducing into the air, water, soil, ect. hazardous substances.

- In the FEIS it says that local and regional air quality standards will be met. The FEIS does **not** address how big of a contributor the CRC will be in greenhouse gas emissions (GHG) emissions and other pollutants. Public participation includes informing the community accurately on the expected emissions of GHG's, carbon monoxide, particulate matter, toxic and hazardous substances and other pollutants that will result from the CRC project.

- The FEIS **failed** to state how much pollution the CRC anticipates releasing into the environment. The FEIS failed to address how much release of pollutants are anticipated. There are no graphs or charts with the real numbers as to expected pollution, contamination, and release of toxins into the environment as a result of CRC construction. There is no description of the worst case scenario of maximum exposure. This information is critical for a low income elderly infirm population.

- **The stated pollution plan in the FEIS is extremely inadequate.** The FEIS failed to take into consideration all pollution and only considered pollution and emissions that come from motor vehicles, deliberately choosing to ignore all other present pollution in the project area. For the local residents of HIMHC the air quality health impact will be directly related to the total pollution level that they are forced to endure. It is therefore critical that the current level of pollution, prior to the initiation of the CRC construction project, be accurately and continuously assessed, posted publicly in a timely manner, and satisfactorily addressed. If the current pollution level is already high then there may not be the available margin to accommodate **any** increase in pollution without extremely adverse and disproportionate consequences to the low income elderly and infirm population at HIMHC.

- **The CRC has not done adequate testing of pollution.** It is critical that accurate levels of exposure to current pollution are assessed as soon as possible. Cumulative impacts are unknowable without first ascertaining the current level of pollution. It is outrageous and unconscionable that the CRC, represented by Nancy Boyd, stated on 10/20/2011 at a meeting with HIMHC residents that the **CRC's position is that there is no value in knowing the total pollution levels the HIMHC residents are subjected and no value in having on-site monitoring of pollution. This is a blatant disregard for the health, well-being, and survival capacity of HIMHC, a low income community.** It is clear that the CRC is not only disinterested but not concerned about the health of HIMHC residents who are currently exposed to significant levels of pollution. To not test the HIMHC community for current levels of pollution is blatant disregard for human life. It is absolutely necessary to provide HIMHC and the public with proper testing. **Proper testing necessarily includes testing all of the project area for current levels of ALL pollution prior to initiation of construction**. Some areas may have high enough levels

9

would be substantially lower than existing emissions for the region and the subareas" (page 3-277). These reductions in emissions are largely the result of on-going reductions in vehicle emissions that will occur with or without the project, and are based on standard assumptions regarding future vehicles and fuel. The anticipated vehicle emission reductions are based largely on regulation-driven improvements in fleet fuel efficiency standards and cleaner gasoline and diesel fuels. Any extraordinary improvements in fleet fuel efficiency or fuels would result in even greater emission reductions.

Projected reductions in vehicle fleet emissions would result in a 25% to 90% reduction in I-5 related criteria pollutant emissions over existing conditions, even with the anticipated growth in population, employment and VMT. In addition, the build alternatives would provide small further reductions in vehicle emissions at the regional level and for most pollutants in each of the subareas along I-5. CO and NOx emissions would be slightly higher with the project than with No-Build (but still lower than existing conditions) in the I-5 subarea between the SR 14 and SR 500 interchanges, as discussed in DEIS Chapter 3 (Section 3.10) and FEIS Chapter 3 (Section 3.10). The updated analysis conducted for the FEIS resulted in very similar findings to those in the DEIS.

Human Health concerns are the basis of many NEPA studies, including those related to air quality. The project has not elected to conduct a door to door survey of respiratory disease in Portland. Only a survey of this type would provide the data needed to make findings specific to the corridor. And, since the project will improve air quality in Portland, there is little need to dedicate the resources for such a survey.

The FEIS contains a summary of the information obtained during preparation of the Hazardous Materials Technical Report. The Report does have some specific information and research regarding potential contaminants for identified sites. However, it is only for sites identified in

P-073-004

that construction in that area is not possible because it would sacrifice human health, well-being and life. HIMHC demands that for their well-being, and for proper evaluation of the environmental impacts, a full and thorough pollution test must be done of ALL current pollutants in the Portland Vancouver project area before construction. Additionally, the pollution levels must be continuously monitored by on-site equipment that is placed in the most polluted areas during construction to ensure that CRC is aware of the levels and can notify the public promptly and based on knowledge from this monitoring equipment take prompt and satisfactory action to protect human life. Until the CRC adequately assessing the entire project area by determining the most polluted locations and placing equipment in those locations it has not done the proper testing to meet the environmental impact requirements.

- The CRC and thus the FEIS cannot state the project will not exceed state and federal air quality standards until it does a thorough evaluation of the current air quality. Vehicle emissions combine with already airborne pollution to create compounded effects. The CRC cannot adequately evaluate air quality by only considering vehicle emissions in a vacuum. Properly evaluation of air quality includes an assessment of the entirety of existing and potential pollutants in the air. The impact on HIMHC, a low income elderly population, including many already in poor health, cannot be accurately determined without knowing the total level of pollution; therefore it is critical that the total of pollution is clearly and specifically addressed in a quantifiable manner. It was not.

- The CRC failed to adequately assess air quality because it did not specifically address the levels tolerable to an elderly or youthful population. HIMHC is home to over 100 children and 60% of the residents of HIMHC are at least 65 years old. The young and the old have diminished capability to tolerate threats to their health, especially in a low income population. The members of HIMHC is a low income community and live within 100 feet of Thunderbird hotel. Clearly any decrease in air quality will have a disproportionately adverse impact on children and an elderly population. The demographics of HIMHC were not specifically evaluated in the FEIS and this is very concerning when one of the three potential staging grounds is the Thunderbird Hotel.

- Elderly individuals and children exposed to construction, especially HIMHC which is a low-income community, will be adversely and disproportionately impacted given their diminished health capacity and thus suffer more severe health consequence than a community with a more typical age demographic. The CRC failed to analyze and the FEIS failed to state the expected health consequences of the CRC project on local communities. It is predictable that there will be increased illness and death in this low income population of children and the elderly when they are subjected to many years of decreased air quality, as well as the well documented significant adverse health consequences of chronic stress; stress which will be unavoidable living next to a major construction site. The Thunderbird hotel is only 100 feet from HIMHC community. Given the low income status of HIMHC, this group meets the environmental justice test of highly adverse and disproportionate impact. The FEIS failed to state and the CRC failed to analyze how many additional deaths are anticipated as a result of the CRC

regulatory databases, not every property within the corridor. The scope of an environmental impact statement for a large corridor project does not include a specific on-site investigation of every single property; it generally looks at summary information for the entire corridor (i.e., regulatory database, aerial photos, Sanborn maps, and windshield survey) to provide an overview of potential issues and how they could impact the various alternatives. The FEIS recommends environmental site assessments in any case of acquisition or property use, but stops at identifying specific issues on each property because of the nature of the changing design and the scope for HazMat within the FEIS. Site assessments will begin following the Record of Decision. And the project will address any contaminants in strict accordance with federal, state, and local regulations.

P-073-004

project. FEIS failed to inform Oregonians and Washingtonians of how many people will die as a direct result of the CRC project. Apparently the CRC considers the excess deaths in low income populations are considered acceptable. **We demand acknowledgment of these disproportionate impacts that are highly adverse and give HIMHC the environmental justice status is rightly deserves.**

- Low income elderly people and children have a lesser capacity to tolerate any insult to their health and wellbeing. Pollution which a healthy adult "may" tolerate has the significant potential to have highly adverse, devastating consequences to very young and very old residents of the HIMHC. The CRC either did not take this into consideration when listing the Thunderbird as a potential staging site, or does not value the health and life of low income populations.

- There is no CRC data in the FEIS that proves that there are no long-term air quality impacts as a result of the project other than a reference to a Chicago study. The FEIS used the Chicago study to show air quality standards will not be exceeded during CRC construction. The FEIS failed to state exactly how it took into consideration the differences in environment, weather, topography, air movement, as well as other existing pollutants when comparing these two very different locations, Portland/Vancouver and Chicago. HIMHC and the general public cannot be properly informed nor have a true opportunity to participate without valid data regarding long term air quality impacts.

- The FEIS failed to meet the NEPA requirement of explaining the project in plain and concise language. It is unclear what constitutes the CRC's pollution control plan. The FEIS does not state the percentage of pollution the CRC expects to leak into the environment. The public needs to be informed of the expected leaks and exposure of pollution to the local environment. HIMHC, being a low income community of very young and very old residents who are especially vulnerable to harm to their health must be properly informed of the risks CRC is exposing them to.

- The FEIS failed to adequately explain the specifications for adequate containment of dust. The FEIS failed to state how much lack of containment of dust is acceptable. There is no chart, graph or summary in the FEIS that explains what surrounding communities will be inhaling, dust or other harmful substance in addition to dust. The CRC failed to investigate and failed to inform Oregonians and Washingtonians about the possible pollution, toxins or hazardous substances local residents will inhale as a direct result of dust from construction. HIMHC is directly downwind from the Thunderbird hotel and will suffer a disproportionate impact due its proximity and the effects on this community will be highly adverse given their fragile health.

P-073-004

- There is no study on dust that shows the potential health consequences for low income populations, especially children and the elderly, who will be subjected to and inhale uncontained dust. Uncontrolled dust due to construction is a certainty. The study that should have been done would assess consequences based on the maximum possible dust young and elderly populations could be exposed to as well as an analysis of what that dust might contain; addressing toxins already present that will be made airborne and therefore more toxic to the population, as well as additional pollution created by the construction. There are residents of HIMHC with chronic lung disease and asthma who are particularly sensitive to air quality. To date CRC has done no investigation of the current health, in particular respiratory limitation of the current residents. This is a blatant disregard for the health and well-being of a low income community.

- The FEIS failed to state clearly, or in any detail, what is "prompt removal" of dust under the dust control plan. The FEIS also failed to state what kind of chemicals will be used to control the dust. HIMHC has over 100 children and many elderly residents. This community is vulnerable and lack of care in choice of chemicals used to control dust could have dire effects.

- Some of the buildings to be demolished are older than 1980 and are likely to contain asbestos, lead, or other toxic substances in them. The FEIS failed to explain in adequate detail how vulnerable populations, such as low income children and elderly residents of HIMHC, will be protected from this possible exposure. CRC did not analyze how effective the protective steps will actually be for vulnerable local residents. The FEIS does not state the known or suspected percentage of contaminants that will be released into the local environment initiated by the CRC demolition. The CRC project will cause HIMHC harmful health consequences. Who will pay the medical bills for local residents who get cancer as a result of the release of asbestos from this demolition? Who will pay for the hospitalization for HIMHC residents who have asthma attacks precipitated by CRC construction?

- Under the transportation conformity rules (40 CFR 93.123 (c)(5)), carbon monoxide and particulate matter hot-spot analyses are not required to consider construction-related activities which cause temporary increases in emissions. This means any construction that lasts 5 years or less. A hot-spot analysis was not done at the potential staging sites. This is unacceptable given the immediate proximity of HIMHC, a low income community of the very young and very old, who would be less able to tolerate expose to carbon monoxide and particulate matter. HIMHC challenges this exception and demands that the health and safety of local residents requires a carbon monoxide and particulate matter hot-stop analysis be performed and in particular include focused evaluation of the impact in the HIMHC local area.

- It is well known that construction projects rarely conclude within the projected time limits. Given the strong possibility that the staging area could last longer than 5 years,

P-073-004

there should be a carbon monoxide and particulate matter analysis performed at each potential staging area. The lack of this testing is especially mischievous when the FEIS acknowledges that hot-spot testing has already been done as certain locations.

- CRC has not considered the pre-existing hazardous substances already present in the soil, ground water, and environment that will become airborne during construction at the Thunderbird hotel and the project area in general. The HIMHC is low income population directly downwind from this staging area. The children and elderly in this community are particularly susceptible to the adverse impact of toxic substances. This mandates further testing of the staging ground because without knowing what is there how will CRC adequately protect this at risk population.

- Knowing the disproportionate detrimental impact of increased compounded pollution on the low income elderly community HIMHC, the CRC needs to either clean up the Thunderbird Hotel site prior to construction or to use a different site distant from a population with a disproportionate possibility of a high adverse consequence.

P-073-005

D. NOISE/VIBRATION:

- The FEIS states that noise dampening walls will be installed in Vancouver. The FEIS does not state that Portland, in specific Hayden Island, and in particular HIMHC will be protected by a noise wall or any form of sound dampening. It is necessary for specific, adequate noise mitigation on Hayden Island to protect the HIMHC community. The on-going and chronic noise and vibration is going to be a major cause of chronic stress for HIMHC community. The significant adverse effects to health, including death, as a direct consequence of chronic stress are well-known. This impact is highly adverse and disproportionate as compared to the general project area. HIMHC, an elderly population, many in frail health, have a much lesser capability to withstand the health consequences of chronic stress which undoubtedly will result in illness, and will contribute to injuries and deaths. The chronic stress arising as a direct result of CRC construction would be less likely to result in illness, injuries, and death if done at a location with more typical demographics. It is necessary for the health and well-being of HIMHC that an adequate noise wall is built, in addition to other appropriate noise mitigation measures. This is especially true if the Thunderbird Hotel is used as a staging ground given that HIMHC is right next door.

- Knowing the highly adverse consequences to HIMHC if the Thunderbird Hotel is chosen as a staging site, it is unacceptable to even consider the Thunderbird Hotel site as a potential staging area. To use the Thunderbird Hotel as a staging area is blatant disregard for the health and well-being of HIMHC, a low income elderly community. To use the

P-073-005

The noise study in the FEIS was performed in accordance with regulations from the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Oregon Department of Transportation (ODOT), and the Washington State Department of Transportation (WSDOT). The regulations are designed to protect the health and welfare of communities with maximum allowable noise levels from transportation noise. For highway noise in Oregon, the criteria for consideration of noise abatement is a peak hour Leq of 65 dBA. A detailed traffic noise analysis was performed for the nearest homes at the HIMHC represented by receivers PD-9 and PD-10. Under the full Build Alternatives, the future noise levels are predicted at 61 dBA Leq, an increase of 4 to 5 dB over the current levels of 56 to 57 dBA. Therefore the future noise levels are within the regulatory criteria and no noise abatement measures are required. Noise levels in Vancouver, where noise abatement is recommended, range from 66 to 77 dBA Leq or more; therefore, noise barriers are well justified. This is because the residences are as close as 50 feet from the highway, while the residences at the HIMHC are over 500 feet from the new bridge. Also, the noise impact criteria does not differentiate residences based on age, race, religion, or other demographics. All residences are treated equally under the noise impact criteria.

The Noise and Vibration Technical Report, an Appendix of the FEIS, contains a section that is specific to the potential noise related to construction. See Section 5.2, Construction Activities and Section 6.3, Proposed Mitigation for Adverse Effects during Construction. Also, the governing criteria for noise related to construction in the City of Portland can be found in City of Portland Municipal Code Title 18, Noise Control. Chapter 18.10.060 provides the criteria for construction noise. Under the City's noise control ordinance, virtually all major construction projects require a noise variance if work is planned during nighttime hours or on Sundays. Daytime construction activities are limited to 85 dBA at 50 feet

P-073-005

Thunderbird Hotel site as a staging area is tantamount to expressing no regard for the value of lives of low income individuals.

- Vibration and noise, for a prolonged duration is harmful to health. The CRC project would require at least one large site to stage equipment, materials, and a large site for fabricating segments of the new bridges. The Thunderbird Hotel is a potential staging ground and is situated immediately adjacent to HIMHC, a low income community. This proximity exposes HIMHC to the highly adverse and disproportionate impacts of stress as a result of noise and vibration caused by CRC construction. Predictably on-going exposure to this noise and vibration will result in the well documented, numerous, highly adverse health consequences associated with suffering chronic stress.

- The CRC failed to do an analysis on noise and vibration that took into account the decreased health and well-being of the disadvantaged elderly residents of HIMHC community. Proper analysis must specifically investigate and address the effects of noise and vibration, and resulting chronic stress on the HIMHC, given that they will be subjected to prolonged noise pollution.

- The FEIS states that HIMHC will not be subjected to noise and vibration pollution in a disproportion and highly adverse manner. This conclusion is not supported. The CRC failed to specifically detail, with supporting studies, how subjection to prolonged noise pollution would NOT have a highly adverse and disproportionate impact on a low income elderly population.

- The DEQ Noise Source Standards could be exceeded at locations within the adjacent neighborhood due to some staging activities, particular equipment used, and the location of the activities on the staging site. If the Thunderbird hotel is selected for staging activities, additional construction noise monitoring and mitigation measures, beyond those discussed in Section 3.11.5, could be required. There should be additional mitigating measures.

- It is unclear in the FEIS if the CRC has done any studies that evaluate the long-term effects of noise and vibration generated by construction at a staging ground. HIMHC is next to the Thunderbird Hotel, a potential site for noise and vibration pollution. A study evaluating the long-term effects of noise and vibration, in particular the impact on a low income elderly population and in particular the impact on manufactured homes must be done. The CRC's FEIS is incomplete without this evaluation.

14

with the exception of trucks (see Section 18.10.020), pile drivers, pavement breakers, scrapers, concrete saws, and rock drills. The contractor would be required to meet the City of Portland Municipal Code Title 18, Noise Control, if the contractor elects to use the site for a staging area. Section 5.2.2 and Section 6.3.2 of the Noise and Vibration Technical Report provide information on construction vibration. Although there are no City of Portland, State of Oregon, or federal regulations related to construction vibration, the contract specification will have a section that would likely limit the contractor to a maximum vibration level. The majority of major vibration-producing activities will be more than 300 feet from the nearest home at the HIMHC. Therefore, it is unlikely that vibration levels at that distance will be of sufficient magnitude to result in any structural issues, including structural issues for manufactured homes.

P-073-005

- Washington requires that there be a vibration study done evaluating possible impacts on residents from noise and vibration. Even if Oregon law doesn't require it, this should be done so that residents of HIMHC can know the personal costs of having the staging ground right by their doorstep. These costs include harm to physical and psychological health, loss to personal property in and adjacent to the home, vibration damage of the physical structure of homes and out buildings (garage/shed/etc.), and disruption of utilities due to damage to utility pipes resulting from construction related vibration. The CRC cannot claim a lack of knowledge of these financial costs when HIMHC residents have continually informed the CRC of this risk that is already a reality to HIMHC residents due to construction at the Mall. Clearly the proximity of the Thunderbird Hotel staging ground and the construction of the bridge itself, are much closer than the Mall and will result in much greater impacts.

- In the FEIS it acknowledges that HIMHC is concerned about the effects of having a staging area construction site only 100 feet away from their homes, however the only response given is "the project has organized many meetings to hear and address these concerns." These concerns have not been addressed. As an Oregonian, angry at this oversight I demand that specific steps, publicly available, are taken to protect local residents within the CRC project area, in particular HIMHC residents, against harm caused by noise and vibration resulted from CRC construction.

- HIMHC is a manufactured home community; these homes have less insulation and presumably less dampening of noise and vibration pollution. There has not been an assessment of impact of noise and vibration pollution, like pile driving on these types of homes. This must be evaluated to accurately assess the impacts on the health of the residents of HIMHC.

- Along with having less insulation, these homes are not on traditional foundations which will subject the homes to more vibration

- The low income residents of HIMHC will be subjected to a higher level of noise even inside their own homes than would residents of non-manufactured homes. This actual level of noise, which will cause injuries to HIMHC, needs to be determined, taking into account the highly adverse consequences suffered by an elderly community who will be at home all day every day, subjected to unrelenting noise and vibration, in addition to decreased air quality and increased chronic stress. This environment increases the likelihood of injuries, in particular hip fractures given that HIMHC is a low income elderly population. The incidents of deaths within 6 months of hip fractures in an elderly population are high. Hip fractures and death are highly adverse and disproportion impacts that only the HIMHC will suffer, given their demographics and proximity to the CRC project.

P-073-006

E. HAZERDOUS MATERIALS

- No action is being taken to clean up the Thunderbird hotel despite the acknowledgement in the FEIS that this location was a former landfill and the site for a automotive service station. The FEIS also admits that due to the thunderbird's previous use it is known or suspected that this location has pre-existing contamination of soil and groundwater. The FEIS has not done any testing on this site to determine the extent of the contamination of soil and ground water. The toxins in the ground will become airborne as soon as construction starts and HIMHC will be disproportionately exposed to these toxins mixed with dust. HIMHC is only 100 feet away from this building which means that over 100 children and hundreds of elderly residents will inhale this compounded pollution of unknown toxicity to the determent of their health.

- The CRC's stated preferred alternative, the LPA, exposes the project area to higher levels of risk by choosing an alternative that requires more hazardous materials sites than other alternatives. This means that residents within the project area, specifically HIMHC will bear the brunt of greater exposure to more toxins.

- **The CRC has made no commitment to clean up the project area after the bridge is constructed.** This is very concerning given the fact that the CRC will create at least three hazardous materials sites. In addition to adding to pollution will re-expose local residents, in particular HIMHC, to existing toxins, hazardous substances, and pollution that is currently in the ground, soil and water.

- **The CRC did not test the project area for soil contamination thus the CRC will not know how much pollution at the end of the project is a result of building the bridge**. The CRC needs to test the soil and water before constructing the bridge as well as post construction and needs to make a commitment to clean up and undo the contamination CRC will cause while building the bridge. This is especially important for residents in the project area, namely HIMHC whose ground water and soil will be disproportionately impacted.

- The FEIS did not make any statement as to what precautions will be taken to stop soil contamination from reaching groundwater. Water is an extremely valuable resource and every precaution should be made to protect the Columbia River and ground water in the project area. The HIMHC, being directly next to a staging area are extremely vulnerable to any contamination to soil and water.

- **The Thunderbird Hotel should not be considered as a staging site** when there are already seven sites on Hayden Island that have moderate risk of containing and releasing hazardous substances. The Thunderbird hotel additionally should not be considered a staging site since it already has a known risk for containing hazardous substances that will be released during construction if this site is chosen. Moreover, to use the

P-073-006

Please see the response to comment P-073-004. The project will complete a full assessment of the environmental conditions after the Record of Decision and once the property owners grant the project rights of entry. If contaminants are found, the project will handle these in compliance with local, state, and federal regulations.

P-073-006

Thunderbird Hotel site, will have a highly adverse and disproportionate impact on HIMHC, given that they are downwind, are low income, and have children and elderly residents who will have the least capability to withstand this threat to their health and well-being.

- The FEIS failed to mention what kinds of pollution, contamination, and spills of hazardous substances are possible in the project area during construction. Even a remotely possibility is of concern to HIMHC which is a low income community that has a high risk population of the very young and very old which have a limited ability to tolerate any threat to their health.

- The FEIS failed to mention any analysis that was done on the Thunderbird Hotel for asbestos, lead or other toxic substances. HIMHC is directly next to and downwind from the Thunderbird Hotel. Any substances in this building that become airborne during deconstruction will enter their community, their homes, their bodies, and their food. HIMHC is a population of very young and old that will without a doubt suffer a highly adverse impact from inhaling these hazardous toxins. This harm is disproportionate to the rest of the project area as well as disproportionate to what would be experienced by a more typical demographic.

- The FEIS failed to state the exact locations of the 23 properties that are older than 1980 being demolished and most likely contain asbestos and lead. The CRC project has also failed to inform local residents around these locations who will be exposed to these hazardous substances during demolition. One of the potential locations is the Thunderbird Hotel, which is situated next to HIMHC. HIMHC has a right to know what they will be exposed to during deconstruction of this hotel as well as other sites.

- The FEIS failed to state how big the staging area will be at Thunderbird Hotel. The FEIS did not acknowledge how much area will be disturbed at this location. If the staging area is at Thunderbird Hotel and disturbs less than 1 acre and does not discharge storm-water to surface water then the NPDES (national pollutant discharge elimination system) requirements will not be met. For the well-being of HIMHC, this is unacceptable and all permits required under NPDES need to be obtained whether or not the Thunderbird staging area disturbs at least 1 acre or discharges storm-water to surface water.

P-073-007

F. ENVIRONMENTAL JUSTICE

- The FEIS in inadequate because it fails to recognize the Hayden Island Manufactured Home Community (HIMHC) as a low income environmental justice community,

P-073-007

Please see response to P-073-001. The CRC recognizes that there are low income and minority households on Hayden Island. The implementing federal and state guidelines on Environmental Justice have and will continue to guide the project's consideration of, outreach to, and mitigation of impacts for these households.

P-073-007

therefore depriving the residents of the proper Environmental Justice Analysis required by NEPA.

- CRC examined income levels on Hayden Island by using census tract data instead of using the more appropriate block group data. The methodology and unit of analysis used to investigate the possibility of disproportionately impacted low income and minority groups was block group data with the exception of determining low income status in Portland. The use of census tracks instead of block group data when determining low income status in Portland effectively masked the actual presence of an environmental justice community.

- The FEIS wants the public to believe that Hayden Island is not low income; only 9% of the residents qualify under the federal poverty line. East Hayden Island is wealthy. West Hayden Island has a manufacture home community, HIMHC, with over 100 children and mostly elderly residents living on social security, and is undeniable a low income community. The financial reality of each side of this island is drastically different but anyone reading the FEIS would not know this truth. HIMHC's low income status that was covered up by the FEIS has significant consequences for HIMHC because lower income populations tend to have poorer health than more wealthy communities. The effects of CRC construction will have a disproportionate and highly adverse impact on low income children and elderly residents who have less capability to tolerate challenges to their health without dire consequences and lack the financial resources to personally mitigate harm resulting from CRC construction.

- **Through public participation the residents of HIMHC made it clear that their community was EJ and was being overlooked, CRC cannot claim the methodology used was a simple oversight.**

- CRC has failed to use a consistent methodology when identifying low-income and minority communities who would be disproportionately impacted. The use of inconsistent methodologies is suspicious and gives the appearance that CRC intentionally used a different methodology solely for determining low income status in Portlanders with the goal of denying HIMHC their rightful status as an environmental justice community. Using census tracks effectively denied, ignored, and took advantage of HIMHC, a low income elderly population.

- We are all aware that HIMHC community has been targeted due to their low income status. The project staging area was not, and would not be considered in an affluent community like the eastern side of Hayden Island. In the United States of America it is

P-073-007

morally reprehensible to try and hide HIMHC's environmental justice status, a goal that is required by presidential executive order 12898. By using a methodology that would hide their low income status CRC has violated NEPA. Knowing increased death will result in a poor elderly community, where death would not occur in a wealthier and healthier community, CRC has essentially takes the position that the lives of the poor have no value. If this is the position of the CRC it should be stated openly. Value of life should not be measured by socio-economic status.

- The cost of living varies from state to state/city to city, it is higher in OR and WA than many other states and using the federal poverty line covers up low income communities in a state with a higher cost of living. The methodology used by the CRC in determining the demographic characteristic of the community is invalid and masks the true nature of the community as significantly low-income relative to the City and County median household income.

- The CRC has failed to accurately determine low income communities given the outdated data used. Since 2000, unemployment has doubled, availability of jobs has decreased, and the economy is significantly depressed. Using outdated statistical information overstates the current financial reality of HIMHC residents. This is unacceptable given that the CRC surveyed some communities for income levels but did not do so for HIMHC, who continually voiced concern of being overlooked as a low income environmental justice community. The limited date CRC chose to collect, using 10,000.00 increments, effectively masked HIMHC's environmental justice status by forcing residents to claim a higher income bracket that does not accurately reflect financial reality. HIMHC has 1,300 residents which include over 100 children; it would not have been over burdensome to survey the actual income of this community. If such a survey would have been done HIMHC would be considered an environmental justice community.

- One of the aforementioned objectives is to specifically target minority, low-income, and limited English-speaking populations within the project area for stakeholder outreach and feedback. Stakeholders that have been identified are;

Low-income residents, minorities, and people speaking limited English (Spanish, Russian, Vietnamese), as identified in the 2005 demographic analysis for the Bridge Influence Area.
. In the FEIS the CRC states that all NEPA requirements have been met or exceeded for public involvement, including **Executive Orders 12898 and 12948, which require each federal agency to make achieving environmental justice part of its mission "by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on**

P-073-007 **minority populations and low-income populations."** If this is the case, then shouldn't block group date been used on Hayden Island because of the income disparity that exists?

P-073-008 **G. ADDITIONAL ISSUES**

- Jim Howell's Common Sense Alternative was never considered as an alternative in the DEIS or FEIS. This alternative projected to cost half as much as the LPA, 1.8 billion instead of 3.6 billion. This is a significant difference given that the CRC project will actually cost 10 billion once all promissory notes and debts are paid. It is unacceptable that the CRC did not make a good faith effort to consider all alternatives especially since it is the tax payers who will bear the brunt of this debt.

- The CRC failed to consider Jim Howell's CSA which should have been considered because CSA will cost half as much, would not cause a 5-10 year increase in traffic and disruption on I-5 and would not take away the Safeway on Hayden Island, a vital resource for a low income community. Additionally, using this alternative does not focus on an enlargement and shift westward of the I-5 bridge and therefore would not have a highly adverse and disproportionate impact on the low income elderly HIMHC, a community least able to tolerate the effects of CRC construction without severe illness and death.

- The CRC Task Force voted on the LPA before looking at over 15,000 public comments. This is a violation of NEPA which requires public participation. Asking for comments is not enough; the CRC must additionally thoroughly read and respond adequately to these comments to meet public participation requirements.

- It is unacceptable that METRO preapproved the FEIS before it came out to the public. This again is a violation of NEPA because METRO approved the CRC project without even considering public comments and thus did not allow public participation.

- NEPA requires that the DEIS and FEIS be "plain and concise." The average person that has no technical training or special degree will not be able to read the FEIS and understand what this document means. The document as a whole is not plain or concise. The FEIS is not written in plain language that helps a reader understand the FEIS as a whole.

20

P-073-008

Many different options for addressing the project's Purpose and Need were evaluated in a screening process prior to the development and evaluation of the alternatives in the DEIS. Options eliminated through the screening process included a new corridor crossing over the Columbia River (in addition to I-5 and I-205), an arterial crossing between Hayden Island and downtown Vancouver, a tunnel under the Columbia River, and various modes of transit other than light rail and bus rapid transit. Section 2.5 of the DEIS explains why a third corridor, arterial crossing of the Columbia River, and several transit modes evaluated in screening were dropped from further consideration because they did not meet the Purpose and Need. For a general description of the screening process see Chapter 2 (Section 2.7) of the FEIS. It should be noted that every proposal received from the public was considered, and many of the proposals that were dropped from further consideration included elements that helped shape the alternatives in the DEIS.

The Task Force heard testimony and was provided written public comments prior to their recommendation on the locally preferred alternative. The Task Force was a very important advisory group but was not a decision-making group. Their recommendation on the LPA was considered part of the input the project and decision-makers received during the DEIS comment period. Metro approved the FEIS which is not the same as approving the project. The preferences for a replacement crossing and for light rail transit were identified by all six local agencies. Only the agencies in Vancouver—C-TRAN, the City of Vancouver, and RTC—specified a preferred Vancouver light rail terminus. As part of this process, the two regional transportation planning agencies, Metro and RTC, adopted the LPA into their Regional Transportation Plan and Metropolitan Transportation Plan, respectively, in late summer 2008 (Metro 08-3960B; RTC 07-08-10). The CRC project is in the Oregon 2010-2013 Statewide Transportation Improvement Program (STIP), the draft 2012-2015 Oregon STIP, and the Washington 2011-2014 STIP.

P-073-009

CONCLUSION

As a resident of Portland I find it alarming that such a vulnerable community, HIMHC, is being treated with such disregard. This offends me on an individual level, as a human being, and as a citizen of the United States of America. This poor community is being ignored, a sheep thrown to wolves. It is unethical to put a construction site within a stone's throw of a community who will be devastatingly harmed by the well documented severe health consequences; including death caused by chronic stress, unnecessary injuries (hip fractures), increased asthma attacks, difficulty breathing, as well as dust, pollution, leaking chemicals, air borne asbestos/lead, particulate matter from diesel fuel, soil contamination, and water contamination, this list is not exhaustive. Thunderbird Hotel will end up a super fund site because CRC feels free to add to existing pollution without any semblance of responsibility to clean up their mess or the known pre-existing pollution at Thunderbird which will be compounded with new pollution caused by CRC construction.

- Do not let CRC overlook existing and valid environmental justice communities, including HIMHC. HIMHC deserves environmental justice status, and this is not the only group overlooked.
- The Thunderbird Hotel should be removed as an option for a construction staging ground.
- CRC should not be able to let a construction company decide where to place a staging ground in order to pass the buck and blame a private party instead of the real culprit the CRC.
- Nancy Body admitted on 10/20/2011 "there is so much still unknown." How dare the CRC release the FEIS with so many contingencies unknown.

Make CRC go back to the drawing board, be accountable to the public and make actual final decisions like; (1) LPA option A or B, (2) where exactly will the construction sites be, (3) what is the actual total pollution level, (4) including all existing pollutants in the air, not arbitrarily limiting it to vehicle emissions in the project area, (5) determine if we are putting too much pollution into one area, (6) is the project, as currently designed, truly addressing the problem and offering a progressive solution, (7) how much will the tax payers actually have to pay 4 billion or 10 billion, (8) admit HIMHC is an EJ community, (9) keep the Safeway, (10) consider building a new bridge and only upgrade I-5 for earthquake safety, (11) enhance public transportation, put that 4 billion towards education instead of a bridge. RESPECT the voice of the public. Leave I-5 alone.

21

The adoption of the LPA by these local agencies does not represent a formal decision by the federal agencies leading the NEPA process or any federal funding commitment.

The FEIS provides a comprehensive and plainly worded description of the project, the environmental impacts, and the proposed mitigation. It has many details specific to many environmental disciplines. In addition to the document itself, the project has produced fact sheets, an interactive website, and has conducted an extensive outreach program to communicate the findings to the public. Multiple methods have been used to engage the public so as to address the needs of a wide variety of people and the project decision-making process. Examples include workshops with facilitated small-group discussions, open houses where participants can talk one-on-one with staff, public hearings, presentations and discussion at community and neighborhood-sponsored meetings, often at the group's request, and advisory group meetings where CRC seeks recommendations from a citizen committee. These events and meetings have taken place at a variety of locations, days of the week and times of the day to meet the needs of the entire community. For more information on the project's public outreach, please see Appendix B of the FEIS.

P-073-009

Please refer to the detailed responses provided to Ms. Meunier's specific comments, above.

P-073-009

After reading the FEIS I personally feel that CRC should start over. They did a very poor job, CRC over looked important environmental concerns, lied to the community, misrepresented themselves and their intentions, have not made a valid effort to protect minorities and the poor (low income communities) or endangered species. The CRC is taking away over 60 million in annual revenue from Hayden Island, in a bad economy this is a very poor decision. CRC is forcing 643 people onto unemployment benefits, another expense put on the tax payers bill. Do not let the CRC continue to harm Oregon.

Respectfully,

Concerned Oregonian

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P-073-010

HIMHC – Hayden Island Manufactured Home Community – on western Hayden Island
EJ – Environmental Justice Community
FEIS – Final Environmental Impact Statement
CRC – Columbia River Crossing
NEPA – National Environmental Policy Act
EO - Presidential Executive Order 12898
LPA – Locally Preferred Alternative
GHG – Green House Gases
Hot Spot – testing for carbon monoxide and particulate matter
NPDES – National Pollutant Discharge Elimination System

As a resident of Portland it is unavoidably clear to me that Hayden Island Manufactured Home Community (HIMHC) qualifies as an environmental justice (EJ) community. HIMHC is a low income community, predominately composed of elderly residents on social security as well as approximately 100 children. The methodology used by the CRC to determine the demographic characteristic of HIMHC was undeniably different from the rest of the areas evaluated by the CRC. CRC intentionally chose a different methodology when looking for low income in Oregon (census tracks) than in Vancouver (block groups). Interestingly, CRC used block group data when looking to see if minorities were disproportionately impacted in both Oregon and Washington. It seems that CRC uses whatever methodology gives the desired results.

Executive Orders 12898 and 12948, requires each federal agency to make achieving environmental justice part of its mission "by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

Based on EO 12898 and NEPA requirements the CRC is obligated to determine low income and minority populations within the project area that will be disproportionately and highly adversely affected. Low income and minorities populations tend to cluster. The sample size used to determine low income or minority populations, if constructed to include only a portion of the population concerned or made sufficiently large to include non-pertinent populations, will deliberately obscure the identification of a true environmental justice community. The use of census track data instead of block group data on Hayden Island gives the appearance of a blatant effort by the CRC to mask what is undoubtedly an environmental justice community, HIMHC, within the project area.

P-073-010

Please see responses to comments P-073-001 to P-073-009 above.

P-073-010

The CRC's arbitrarily narrowed drawing of the project boundaries again gives the appearance of a deliberate effort to exclude additional environmental justice communities that are well-known to be present within the North Portland area. Moreover, clearly the environmental impact of this project will not only effect the very narrowly CRC identified corridor/parameters, but will further extend into the North Portland area that is home to minority and low income populations.

It is my stance that NEPA requires CRC to make a good faith effort to meet the requirements of EO 12898. This requires CRC to accurately evaluate the project area by not only considering direct impacts of construction on the immediate surrounding area but also to consider air quality impacts which will affect a greater area. North Portland which is currently surrounded by the filth of highway pollution, pollution from waste facilities, toxins from industrial facilities, I-205 which is home to a growing minority population as they are being economically forced from inner NE Portland, I-84 which is already heavily congested will have even greater congestion as a result of this project, are being completely excluded from the DEIS and FEIS when evaluating CRC's environmental impact. **This is gerrymandering.**

Using a census track to determine low income in Oregon instead of block group data, which was used for all other EJ testing, shows a conscious intent on CRC's part to masks the true nature of the HIMHC community. Portland has a higher cost of living than some other states, so using the federal poverty line is absolutely inappropriate as a comparison. HIMHC is significantly low-income relative to the City and County median household income. Even using the inapplicable comparison of the federal poverty line, if a proper income survey was done at HIMHC it would have been unavoidably clear that HIMHC is a low income community qualifying for environmental justice status. HIMHC was not surveyed, although such a survey was done in other communities. Being a low income community means that HIMHC deserves environmental justice (EJ) status under NEPA. The FEIS failed to identify HIMHC as an environmental justice community. **This is gerrymandering**. HIMHC is due EJ status and all the protections that come with it. Until CRC makes HIMHC an EJ community it is in clear violation of NEPA requirements.

The DEIS and FEIS exemplify CRC's effort to manipulate data and statistics so as to exclude valid environmental justice communities within the project area, if it were properly

P-073-010

drawn. Do not let them get away with it by approving this inefficient, grossly overpriced project that will harm Oregon and Washington, both economically and socially. I vehemently oppose the CRC project in its current form. The CRC project in its current form is unnecessary and it ignores the decrease in traffic and most importantly ignores the will of the people. We want more bridges, more options over the river, save money not spend in a bad economy, we need better schools, better paid teachers, earthquake upgrades for all bridges in Portland not just I-5. We want improved public transportation. Re-working I-5 is the least of our concerns. There is more than one way to fix the congestion on the I-5 bridge. Please do not approve this project and force Oregonians and Washingtonians to pay a 10 billion dollar bill that we the tax payers will have to pay. I want better schools not a big fancy bridge that will simply displace congestion from the Columbia River to the downtown Portland I-84 area. This project does not resolve the bottleneck traffic problem; it just moves it further south. Downtown Portland already has harmful levels of pollution in the air and this project will only exacerbate our air quality. Additionally, this bridge will have the exact same problem in 30 years. Construction will take 10 years. It is not worth it.

Financially the CRC project is not worth it. Ethically what CRC is doing is wrong. The financial, emotional, psychological, physical, and livability impact that will be suffered by HIMHC is disproportionate, highly adverse and appreciably more severe than to the residents of the rest of the project area.

- Low income populations, as a group, have poorer health than wealthy communities. As a result of this less sound state of health, they suffer ill health and death from challenges that more healthy populations can tolerate. Ill health and death are significant adverse impacts.
- The very old and very young are the segments of society that are most likely to become ill and or die from health challenges that the majority of the population can tolerate.

The HIMHC compounds the fragile health risks of low income as well as those of the very old and the very young. The HIMHC is a high risk group for significant adverse impacts from health challenges. This is a community most likely to suffer appreciably more injury from; expose to toxic substances, decreased air quality, the chronic stress incurred by on-going noise and vibration insults to their known lesser capacity to tolerate such exposure. **This is the type of community most likely to suffer ill health and probable death as a direct consequence of**

P-073-010

the impact of the CRC project. Every effort should be made to move every aspect of the CRC project as far away from HIMHC community as possible and to maximize mitigation efforts.

The HIMHC residents now live in a relatively tranquil environment with fresher air from the Columbia air currents. However, polluters on the river and onshore currently harm Hayden Island air quality. Once CRC construction starts, HIMHC's living environment will change dramatically and make their environment one of on-going noise, vibration, and air polluted with particles and toxic substances. Instead of a health supporting, tranquil environment, it will become an environment of on-going, inescapable chronic stress; both psychological as well as in the form of more direct physical health challenges. The combination of on-going mental psychological stress and known physical toxic exposure on a population already at high risk for significant adverse impact to health challenges makes it a foregone conclusion that decrease in well-being, ill health, and probable death will occur in this select population if the CRC project proceeds as planned (stages at Thunderbird hotel). Despite awareness of the illness that will result in the HIMHC as a direct result of CRC construction, the CRC plans would also limit this community's timely access to emergency vehicles during the CRC project. **How can the CRC have such blatant disregard for the lives and well-being of this segment of society?**

The significant adverse impact suffered by the residents of the HIMHC is an obvious predictable consequence. It cannot be claimed to be unforeseen. Knowing the unacceptable significant adverse impact the HIMHC residents will predictably suffer; the onus is on the CRC to earnestly explore other alternatives with less impact on this fragile community. One option that would seem to minimize the HIMHC exposure is Jim Howell's common sense alternative option. The common sense alternative by Jim Howell is a 6 minute YouTube video, watch it.

Below are known concerns of HIMHC that have been knowingly overlooked. I have been present at CRC Q&A sessions and it disgusted me to watch CRC people answer questions with an evasive and non-responsive answer. It was offensive and it demeaned members of the HIMHC community's valid concerns. Inability to be "plain and concise" in person just shows that CRC, in person as well as in the DEIS and FEIS failed to be "plain and concise" another violation of NEPA. How many times can CRC violate NEPA and still be approved?

P-073-010

A. SAFEWAY CONCERNS

- It is critical for the health of the low income residents of HIMHC to have fresh food available within walking distance. The only store that meets this requirement is the existing Safeway. 30% of HIMHC residents do not drive, 60% are 65 or older, several require mobility assistance (walker/wheelchair) and therefore cannot walk far. Removing the Safeway will have a highly adverse and disproportionate impact on the well-being of HIMHC.

- The alternative grocery stores listed in the FEIS are all several miles away and are not accessible to a non-mobile community. The FEIS states that people with disabilities or mobility limitations that live near Safeway will suffer a greater impact because they will have to travel farther to get fresh food. The projected transportation improvements do not address or acknowledge the financial and physical limitations of this low income community. These alternatives are 4 miles away, which means that an elderly disabled resident will travel roundtrip over 8 miles, heavy bags in hand to gain access to vital resources like fresh vegetable, meats and fruits.

Below are the FEIS listed alternatives that are unacceptable and do not mitigate:

- Cash in Carry is for restaurants and only sells in bulk
- Fred Meyers in Vancouver – 4 miles away and requires residents to pay a toll.
- New Seasons – 3.6 miles = expensive
- Fred Meyers 3.9 Miles – 4 miles, each way = 8 miles carrying heavy food
- Home delivery= expensive= requires internet, computer, credit card, bank account
- A store equivalent to Safeway, within walking distance of an elderly population must be maintained. Improving vehicle mobility from the island does not help people who depend on walking to get their groceries.

- The FEIS claims that grocery store delivery service is an acceptable mitigation to the loss of Safeway. This alternative presumes the financial resources to be able to afford a computer, the monthly internet fees, a bank account, good credit, a credit card and money to pay for a home delivery fee. This alternative is expensive and completely ignores the financial reality and limitations of HIMHC. This is not an acceptable form of mitigation

- Taking away access to fresh food from a low income community of elderly, disabled residents, and children is a direct assault on the health of HIMHC, a population already at risk. The cost of ill health is the largest drain on U.S. economy. It is clearly not in the best interests of the public to promote ill health, especially to children and elderly citizens. HIMHC will suffer a disproportionate impact compared to other communities specifically because this community is composed primarily of the very young and very old who are the most vulnerable segments of society.

- At the end of section 3.5, under question 2 it states "Does the project affect a resource that is especially important to a low income population" FEIS answered no. The FEIS is wrong. HIMHC residents have continually vocalized concern about losing access to the

P-073-010

only on island location for fresh fruit, meats, and veggies; Safeway. The fragile health of HIMHC will suffer a disproportionate impact if denied fresh food. The very young and very old are less able to respond to challenges to their health. The harm ranges from vitamin deficiencies, diminished capacity to healing from surgery, and diminished capacity to fight infections including even the common cold which will in some instances progress to pneumonia and death.

- At the end of 3.5, Question 4 "would the project result in disproportionately high and adverse impacts on a low income population that would be appreciably more severe or greater in magnitude than the impact that would be suffered by non-minority and non-low income populations?" FEIS answered no. FEIS is wrong. The more affluent, eastern side of Hayden Island can get their groceries delivered. The western side is poor. It is well documented that the poor have less vigorous health. Moreover, HIMHC is composed of children and the elderly, which again are the well documented segments of society most at risk from health challenges. This is a population least able to tolerate inability to have access to fresh food. Therefore there is no doubt that HIMHC will have a highly adverse and suffer a disproportionate impact if their health is further diminished by removing access to fresh foods.

- FEIS lists a Washington Fred Meyer's location as mitigation for the loss of the Safeway. Shopping at this location would force HIMHC residents to travel over 8 miles round trip and pay a toll. Is it unreasonable to expect HIMHC, a low income community to pay a toll every time they need fresh produce and meat.

B. BRIDGE & UTILITIES

- 60% of the residents of HIMHC are 65 or older. In order to avoid a highly adverse and disparate impact against this population the local access bridge must be built in the first phase of the project to ensure efficient emergency access.

  The residents of HIMHC are older, in poorer health in comparison to the general population and thus will have a greater need for rapid access to emergency vehicle medical care. Every second counts for heart and brain injuries. **Any delay in the arrival of medical emergency vehicles will result in permanent injuries and potentially death.** Not only is it morally irresponsible, it is fiscally irresponsible because due to preventable delay in timely access to emergency medical care a greater number of elderly individuals will no longer be able to live independently and will be force to shift to state supported living facilities. This is a hidden cost that must be publicly addressed, in terms of not only dollars, but loss of life, quality of life, and autonomy. Initial construction of the local access bridge to Hayden Island to allow timely rescue and removal by emergencies vehicles is vital to the health and safety of HIMHC. Option A of the LPA, the local access bridge to Hayden Island must be built in the first phase of CRC construction.

P-073-010

- The FEIS included an LPA "option B" which does not provide a local access bridge to Hayden Island. Option B was not included in any alternatives presented in the DEIS and thus excluded the public from discussion and participation regarding the option, contrary to the requirements of NEPA.

- On 10/20/2011 Nancy Body did a question and answer session with HIMHC residents. In this discussion it became alarming clear that LPA Option A is not in any way the committed choice for CRC construction. **It is unacceptable that CRC has not made a commitment on the bridge design when releasing the FEIS**. Giving the public 30 days to comment is abhorrently meaningless when the real decisions are made after the close of the comment period thus eliminating any opportunity for community input on the CRC design. The CRC project is stated to be for the benefit of the public and it is counterintuitive to ignore and remove the public's ability to participate. The public is footing the bill and their input must be directly and satisfactorily addressed.

- The FEIS failed to inform HIMHC that during construction their vital utilities, such as water, sewer, and electricity will be shut off for indeterminate amounts of time. This reality was not in the DEIS or any other document previous to the release of the FEIS. It is unacceptable that CRC did not explore the potential consequences to a population with fragile health, of elderly residents and children. The loss of these vital utilities, even temporarily could potentially have a dire effect. The onus is on the CRC to explore and then mitigate the shutdown of these utilities. Without knowing the current and foreseeable future medical equipment needs in this population CRC cannot determine if any interruption in utilities can be tolerated by HIMHC.

  Did CRC consider that HIMHC residents might use breath apnea machines, run oxygen tanks, kidney machines for home dialysis, using IV medications (morphine pump, or medicinal pump that needs to stay plugged in), or have babies with SIDS – sudden infant death syndrome? Older people use monitors in case they fall; this signal is weak and needs electricity or phone lines to work effectively.

- The CRC acknowledges in the FEIS that it is "especially aware of the sensitive circumstances on Hayden Island" in regards to the shut off of vital utilities. It is knowable that there will be increased illness and death in the HIMHC community as a direct result of the CRC project; Illness and death that would not necessarily occur in a more typical demographic population. CRC has made no commitment nor any statement at all in the FEIS as to what mitigation will be undertaken by CRC to ensure the health and well-being of HIMHC while their vital utilities are shutoff. CRC has not mentioned any financial responsibility in the FEIS as to any mitigation that will be required to protect this community, such as generators or water tanks. The CRC has acknowledges a highly adverse and disparate impact on HIMHC. NEPA requires mitigation steps be taken. Merely acknowledging the hardship the CRC will place on HIMHC is not mitigation. The FEIS is deficient because it fails to state how it will mitigate against the loss of vital utilities.

P-073-010

- **The FEIS does not acknowledge or quantify the illness and death it will cause in an elderly population, in particular HIMHC, as a direct consequence of the project.**

C. AIR QUALITY MONITORING

- A definitive staging site was **not** selected in the FEIS. The FEIS cannot accurately determine the effects to air quality and health consequences to local residents without specifying where the CRC will be bringing and introducing into the air, water, soil, ect. hazardous substances.

- In the FEIS it says that local and regional air quality standards will be met. The FEIS does **not** address how big of a contributor the CRC will be in greenhouse gas emissions (GHG) emissions and other pollutants. Public participation includes informing the community accurately on the expected emissions of GHG's, carbon monoxide, particulate matter, toxic and hazardous substances and other pollutants that will result from the CRC project.

- The FEIS **failed** to state how much pollution the CRC anticipates releasing into the environment. The FEIS failed to address how much release of pollutants are anticipated. There are no graphs or charts with the real numbers as to expected pollution, contamination, and release of toxins into the environment as a result of CRC construction. There is no description of the worst case scenario of maximum exposure. This information is critical for a low income elderly infirm population.

- **The stated pollution plan in the FEIS is extremely inadequate.** The FEIS failed to take into consideration all pollution and only considered pollution and emissions that come from motor vehicles, deliberately choosing to ignore all other present pollution in the project area. For the local residents of HIMHC the air quality health impact will be directly related to the total pollution level that they are forced to endure. It is therefore critical that the current level of pollution, prior to the initiation of the CRC construction project, be accurately and continuously assessed, posted publicly in a timely manner, and satisfactorily addressed. If the current pollution level is already high then there may not be the available margin to accommodate **any** increase in pollution without extremely adverse and disproportionate consequences to the low income elderly and infirm population at HIMHC.

- **The CRC has not done adequate testing of pollution.** It is critical that accurate levels of exposure to current pollution are assessed as soon as possible. Cumulative impacts are unknowable without first ascertaining the current level of pollution. It is outrageous and unconscionable that the CRC, represented by Nancy Boyd, stated on 10/20/2011 at a meeting with HIMHC residents that the **CRC's position is that there is no value in knowing the total pollution levels the HIMHC residents are subjected and no value in having on-site monitoring of pollution. This is a blatant disregard for the health, well-being, and survival capacity of HIMHC, a low income community.** It is clear that the CRC is not only disinterested but not concerned about the health of HIMHC

P-073-010

residents who are currently exposed to significant levels of pollution. To not test the HIMHC community for current levels of pollution is blatant disregard for human life. It is absolutely necessary to provide HIMHC and the public with proper testing. **Proper testing necessarily includes testing all of the project area for current levels of ALL pollution prior to initiation of construction**. Some areas may have high enough levels that construction in that area is not possible because it would sacrifice human health, well-being and life. HIMHC demands that for their well-being, and for proper evaluation of the environmental impacts, a full and thorough pollution test must be done of ALL current pollutants in the Portland Vancouver project area before construction. Additionally, the pollution levels must be continuously monitored by on-site equipment that is placed in the most polluted areas during construction to ensure that CRC is aware of the levels and can notify the public promptly and based on knowledge from this monitoring equipment take prompt and satisfactory action to protect human life. Until the CRC adequately assessing the entire project area by determining the most polluted locations and placing equipment in those locations it has not done the proper testing to meet the environmental impact requirements.

- The CRC and thus the FEIS cannot state the project will not exceed state and federal air quality standards until it does a thorough evaluation of the current air quality. Vehicle emissions combine with already airborne pollution to create compounded effects. The CRC cannot adequately evaluate air quality by only considering vehicle emissions in a vacuum. Properly evaluation of air quality includes an assessment of the entirety of existing and potential pollutants in the air. The impact on HIMHC, a low income elderly population, including many already in poor health, cannot be accurately determined without knowing the total level of pollution; therefore it is critical that the total of pollution is clearly and specifically addressed in a quantifiable manner. It was not.

- The CRC failed to adequately assess air quality because it did not specifically address the levels tolerable to an elderly or youthful population. HIMHC is home to over 100 children and 60% of the residents of HIMHC are at least 65 years old. The young and the old have diminished capability to tolerate threats to their health, especially in a low income population. The members of HIMHC is a low income community and live within 100 feet of Thunderbird hotel. Clearly any decrease in air quality will have a disproportionately adverse impact on children and an elderly population. The demographics of HIMHC were not specifically evaluated in the FEIS and this is very concerning when one of the three potential staging grounds is the Thunderbird Hotel.

- Elderly individuals and children exposed to construction, especially HIMHC which is a low-income community, will be adversely and disproportionately impacted given their diminished health capacity and thus suffer more severe health consequence than a community with a more typical age demographic. The CRC failed to analyze and the FEIS failed to state the expected health consequences of the CRC project on local communities. It is predictable that there will be increased illness and death in this low income population of children and the elderly when they are subjected to many years of decreased air quality, as well as the well documented significant adverse health consequences of chronic stress; stress which will be unavoidable living next to a major

P-073-010

construction site. The Thunderbird hotel is only 100 feet from HIMHC community. Given the low income status of HIMHC, this group meets the environmental justice test of highly adverse and disproportionate impact. The FEIS failed to state and the CRC failed to analyze how many additional deaths are anticipated as a result of the CRC project. FEIS failed to inform Oregonians and Washingtonians of how many people will die as a direct result of the CRC project. Apparently the CRC considers the excess deaths in low income populations are considered acceptable. **We demand acknowledgment of these disproportionate impacts that are highly adverse and give HIMHC the environmental justice status is rightly deserves.**

- Low income elderly people and children have a lesser capacity to tolerate any insult to their health and wellbeing. Pollution which a healthy adult "may" tolerate has the significant potential to have highly adverse, devastating consequences to very young and very old residents of the HIMHC. The CRC either did not take this into consideration when listing the Thunderbird as a potential staging site, or does not value the health and life of low income populations.

- There is no CRC data in the FEIS that proves that there are no long-term air quality impacts as a result of the project other than a reference to a Chicago study. The FEIS used the Chicago study to show air quality standards will not be exceeded during CRC construction. The FEIS failed to state exactly how it took into consideration the differences in environment, weather, topography, air movement, as well as other existing pollutants when comparing these two very different locations, Portland/Vancouver and Chicago. HIMHC and the general public cannot be properly informed nor have a true opportunity to participate without valid data regarding long term air quality impacts.

- The FEIS failed to meet the NEPA requirement of explaining the project in plain and concise language. It is unclear what constitutes the CRC's pollution control plan. The FEIS does not state the percentage of pollution the CRC expects to leak into the environment. The public needs to be informed of the expected leaks and exposure of pollution to the local environment. HIMHC, being a low income community of very young and very old residents who are especially vulnerable to harm to their health must be properly informed of the risks CRC is exposing them to.

- The FEIS failed to adequately explain the specifications for adequate containment of dust. The FEIS failed to state how much lack of containment of dust is acceptable. There is no chart, graph or summary in the FEIS that explains what surrounding communities will be inhaling, dust or other harmful substance in addition to dust. The CRC failed to investigate and failed to inform Oregonians and Washingtonians about the possible pollution, toxins or hazardous substances local residents will inhale as a direct result of dust from construction. HIMHC is directly downwind from the Thunderbird hotel and will suffer a disproportionate impact due its proximity and the effects on this community will be highly adverse given their fragile health.

P-073-010

- There is no study on dust that shows the potential health consequences for low income populations, especially children and the elderly, who will be subjected to and inhale uncontained dust. Uncontrolled dust due to construction is a certainty. The study that should have been done would assess consequences based on the maximum possible dust young and elderly populations could be exposed to as well as an analysis of what that dust might contain; addressing toxins already present that will be made airborne and therefore more toxic to the population, as well as additional pollution created by the construction. There are residents of HIMHC with chronic lung disease and asthma who are particularly sensitive to air quality. To date CRC has done no investigation of the current health, in particular respiratory limitation of the current residents. This is a blatant disregard for the health and well-being of a low income community.

- The FEIS failed to state clearly, or in any detail, what is "prompt removal" of dust under the dust control plan. The FEIS also failed to state what kind of chemicals will be used to control the dust. HIMHC has over 100 children and many elderly residents. This community is vulnerable and lack of care in choice of chemicals used to control dust could have dire effects.

- Some of the buildings to be demolished are older than 1980 and are likely to contain asbestos, lead, or other toxic substances in them. The FEIS failed to explain in adequate detail how vulnerable populations, such as low income children and elderly residents of HIMHC, will be protected from this possible exposure. CRC did not analyze how effective the protective steps will actually be for vulnerable local residents. The FEIS does not state the known or suspected percentage of contaminants that will be released into the local environment initiated by the CRC demolition. The CRC project will cause HIMHC harmful health consequences. Who will pay the medical bills for local residents who get cancer as a result of the release of asbestos from this demolition? Who will pay for the hospitalization for HIMHC residents who have asthma attacks precipitated by CRC construction?

- Under the transportation conformity rules (40 CFR 93.123 (c)(5)), carbon monoxide and particulate matter hot-spot analyses are not required to consider construction-related activities which cause temporary increases in emissions. This means any construction that lasts 5 years or less. A hot-spot analysis was not done at the potential staging sites. This is unacceptable given the immediate proximity of HIMHC, a low income community of the very young and very old, who would be less able to tolerate expose to carbon monoxide and particulate matter. HIMHC challenges this exception and demands that the health and safety of local residents requires a carbon monoxide and particulate matter hot-stop analysis be performed and in particular include focused evaluation of the impact in the HIMHC local area.

- It is well known that construction projects rarely conclude within the projected time limits. Given the strong possibility that the staging area could last longer than 5 years, there should be a carbon monoxide and particulate matter analysis performed at each potential staging area. The lack of this testing is especially mischievous when the FEIS acknowledges that hot-spot testing has already been done as certain locations.

P-073-010

- CRC has not considered the pre-existing hazardous substances already present in the soil, ground water, and environment that will become airborne during construction at the Thunderbird hotel and the project area in general. The HIMHC is low income population directly downwind from this staging area. The children and elderly in this community are particularly susceptible to the adverse impact of toxic substances. This mandates further testing of the staging ground because without knowing what is there how will CRC adequately protect this at risk population.

- Knowing the disproportionate detrimental impact of increased compounded pollution on the low income elderly community HIMHC, the CRC needs to either clean up the Thunderbird Hotel site prior to construction or to use a different site distant from a population with a disproportionate possibility of a high adverse consequence.

D. NOISE/VIBRATION:

- The FEIS states that noise dampening walls will be installed in Vancouver. The FEIS does not state that Portland, in specific Hayden Island, and in particular HIMHC will be protected by a noise wall or any form of sound dampening. It is necessary for specific, adequate noise mitigation on Hayden Island to protect the HIMHC community. The on-going and chronic noise and vibration is going to be a major cause of chronic stress for HIMHC community. The significant adverse effects to health, including death, as a direct consequence of chronic stress are well-known. This impact is highly adverse and disproportionate as compared to the general project area. HIMHC, an elderly population, many in frail health, have a much lesser capability to withstand the health consequences of chronic stress which undoubtedly will result in illness, and will contribute to injuries and deaths. The chronic stress arising as a direct result of CRC construction would be less likely to result in illness, injuries, and death if done at a location with more typical demographics. It is necessary for the health and well-being of HIMHC that an adequate noise wall is built, in addition to other appropriate noise mitigation measures. This is especially true if the Thunderbird Hotel is used as a staging ground given that HIMHC is right next door.

- Knowing the highly adverse consequences to HIMHC if the Thunderbird Hotel is chosen as a staging site, it is unacceptable to even consider the Thunderbird Hotel site as a potential staging area. To use the Thunderbird Hotel as a staging area is blatant disregard for the health and well-being of HIMHC, a low income elderly community. To use the Thunderbird Hotel site as a staging area is tantamount to expressing no regard for the value of lives of low income individuals.

P-073-010

- Vibration and noise, for a prolonged duration is harmful to health. The CRC project would require at least one large site to stage equipment, materials, and a large site for fabricating segments of the new bridges. The Thunderbird Hotel is a potential staging ground and is situated immediately adjacent to HIMHC, a low income community. This proximity exposes HIMHC to the highly adverse and disproportionate impacts of stress as a result of noise and vibration caused by CRC construction. Predictably on-going exposure to this noise and vibration will result in the well documented, numerous, highly adverse health consequences associated with suffering chronic stress.

- The CRC failed to do an analysis on noise and vibration that took into account the decreased health and well-being of the disadvantaged elderly residents of HIMHC community. Proper analysis must specifically investigate and address the effects of noise and vibration, and resulting chronic stress on the HIMHC, given that they will be subjected to prolonged noise pollution.

- The FEIS states that HIMHC will not be subjected to noise and vibration pollution in a disproportion and highly adverse manner. This conclusion is not supported. The CRC failed to specifically detail, with supporting studies, how subjection to prolonged noise pollution would NOT have a highly adverse and disproportionate impact on a low income elderly population.

- The DEQ Noise Source Standards could be exceeded at locations within the adjacent neighborhood due to some staging activities, particular equipment used, and the location of the activities on the staging site. If the Thunderbird hotel is selected for staging activities, additional construction noise monitoring and mitigation measures, beyond those discussed in Section 3.11.5, could be required. There should be additional mitigating measures.

- It is unclear in the FEIS if the CRC has done any studies that evaluate the long-term effects of noise and vibration generated by construction at a staging ground. HIMHC is next to the Thunderbird Hotel, a potential site for noise and vibration pollution. A study evaluating the long-term effects of noise and vibration, in particular the impact on a low income elderly population and in particular the impact on manufactured homes must be done. The CRC's FEIS is incomplete without this evaluation.

P-073-010

- Washington requires that there be a vibration study done evaluating possible impacts on residents from noise and vibration. Even if Oregon law doesn't require it, this should be done so that residents of HIMHC can know the personal costs of having the staging ground right by their doorstep. These costs include harm to physical and psychological health, loss to personal property in and adjacent to the home, vibration damage of the physical structure of homes and out buildings (garage/shed/etc.), and disruption of utilities due to damage to utility pipes resulting from construction related vibration. The CRC cannot claim a lack of knowledge of these financial costs when HIMHC residents have continually informed the CRC of this risk that is already a reality to HIMHC residents due to construction at the Mall. Clearly the proximity of the Thunderbird Hotel staging ground and the construction of the bridge itself, are much closer than the Mall and will result in much greater impacts.

- In the FEIS it acknowledges that HIMHC is concerned about the effects of having a staging area construction site only 100 feet away from their homes, however the only response given is "the project has organized many meetings to hear and address these concerns." These concerns have not been addressed. As an Oregonian, angry at this oversight I demand that specific steps, publicly available, are taken to protect local residents within the CRC project area, in particular HIMHC residents, against harm caused by noise and vibration resulted from CRC construction.

- HIMHC is a manufactured home community; these homes have less insulation and presumably less dampening of noise and vibration pollution. There has not been an assessment of impact of noise and vibration pollution, like pile driving on these types of homes. This must be evaluated to accurately assess the impacts on the health of the residents of HIMHC.

- Along with having less insulation, these homes are not on traditional foundations which will subject the homes to more vibration

- The low income residents of HIMHC will be subjected to a higher level of noise even inside their own homes than would residents of non-manufactured homes. This actual level of noise, which will cause injuries to HIMHC, needs to be determined, taking into account the highly adverse consequences suffered by an elderly community who will be at home all day every day, subjected to unrelenting noise and vibration, in addition to decreased air quality and increased chronic stress. This environment increases the likelihood of injuries, in particular hip fractures given that HIMHC is a low income elderly population. The incidents of deaths within 6 months of hip fractures in an elderly

P-073-010

population are high. Hip fractures and death are highly adverse and disproportion impacts that only the HIMHC will suffer, given their demographics and proximity to the CRC project.

E. HAZERDOUS MATERIALS

- No action is being taken to clean up the Thunderbird hotel despite the acknowledgement in the FEIS that this location was a former landfill and the site for a automotive service station. The FEIS also admits that due to the thunderbird's previous use it is known or suspected that this location has pre-existing contamination of soil and groundwater. The FEIS has not done any testing on this site to determine the extent of the contamination of soil and ground water. The toxins in the ground will become airborne as soon as construction starts and HIMHC will be disproportionately exposed to these toxins mixed with dust. HIMHC is only 100 feet away from this building which means that over 100 children and hundreds of elderly residents will inhale this compounded pollution of unknown toxicity to the determent of their health.

- The CRC's stated preferred alternative, the LPA, exposes the project area to higher levels of risk by choosing an alternative that requires more hazardous materials sites than other alternatives. This means that residents within the project area, specifically HIMHC will bear the brunt of greater exposure to more toxins.

- **The CRC has made no commitment to clean up the project area after the bridge is constructed.** This is very concerning given the fact that the CRC will create at least three hazardous materials sites. In addition to adding to pollution will re-expose local residents, in particular HIMHC, to existing toxins, hazardous substances, and pollution that is currently in the ground, soil and water.

- **The CRC did not test the project area for soil contamination thus the CRC will not know how much pollution at the end of the project is a result of building the bridge**. The CRC needs to test the soil and water before constructing the bridge as well as post construction and needs to make a commitment to clean up and undo the contamination CRC will cause while building the bridge. This is especially important for residents in the project area, namely HIMHC whose ground water and soil will be disproportionately impacted.

- The FEIS did not make any statement as to what precautions will be taken to stop soil contamination from reaching groundwater. Water is an extremely valuable resource and every precaution should be made to protect the Columbia River and ground water in the

P-073-010

project area. The HIMHC, being directly next to a staging area are extremely vulnerable to any contamination to soil and water.

- **The Thunderbird Hotel should not be considered as a staging site** when there are already seven sites on Hayden Island that have moderate risk of containing and releasing hazardous substances. The Thunderbird hotel additionally should not be considered a staging site since it already has a known risk for containing hazardous substances that will be released during construction if this site is chosen. Moreover, to use the Thunderbird Hotel site, will have a highly adverse and disproportionate impact on HIMHC, given that they are downwind, are low income, and have children and elderly residents who will have the least capability to withstand this threat to their health and well-being.

- The FEIS failed to mention what kinds of pollution, contamination, and spills of hazardous substances are possible in the project area during construction. Even a remotely possibility is of concern to HIMHC which is a low income community that has a high risk population of the very young and very old which have a limited ability to tolerate any threat to their health.

- The FEIS failed to mention any analysis that was done on the Thunderbird Hotel for asbestos, lead or other toxic substances. HIMHC is directly next to and downwind from the Thunderbird Hotel. Any substances in this building that become airborne during deconstruction will enter their community, their homes, their bodies, and their food. HIMHC is a population of very young and old that will without a doubt suffer a highly adverse impact from inhaling these hazardous toxins. This harm is disproportionate to the rest of the project area as well as disproportionate to what would be experienced by a more typical demographic.

- The FEIS failed to state the exact locations of the 23 properties that are older than 1980 being demolished and most likely contain asbestos and lead. The CRC project has also failed to inform local residents around these locations who will be exposed to these hazardous substances during demolition. One of the potential locations is the Thunderbird Hotel, which is situated next to HIMHC. HIMHC has a right to know what they will be exposed to during deconstruction of this hotel as well as other sites.

- The FEIS failed to state how big the staging area will be at Thunderbird Hotel. The FEIS did not acknowledge how much area will be disturbed at this location. If the staging area is at Thunderbird Hotel and disturbs less than 1 acre and does not discharge storm-water to surface water then the NPDES (national pollutant discharge elimination system)

P-073-010

requirements will not be met. For the well-being of HIMHC, this is unacceptable and all permits required under NPDES need to be obtained whether or not the Thunderbird staging area disturbs at least 1 acre or discharges storm-water to surface water.

F. ENVIRONMENTAL JUSTICE

- The FEIS in inadequate because it fails to recognize the Hayden Island Manufactured Home Community (HIMHC) as a low income environmental justice community, therefore depriving the residents of the proper Environmental Justice Analysis required by NEPA.

- CRC examined income levels on Hayden Island by using census tract data instead of using the more appropriate block group data. The methodology and unit of analysis used to investigate the possibility of disproportionately impacted low income and minority groups was block group data with the exception of determining low income status in Portland. The use of census tracks instead of block group data when determining low income status in Portland effectively masked the actual presence of an environmental justice community.

- The FEIS wants the public to believe that Hayden Island is not low income; only 9% of the residents qualify under the federal poverty line. East Hayden Island is wealthy. West Hayden Island has a manufacture home community, HIMHC, with over 100 children and mostly elderly residents living on social security, and is undeniable a low income community. The financial reality of each side of this island is drastically different but anyone reading the FEIS would not know this truth. HIMHC's low income status that was covered up by the FEIS has significant consequences for HIMHC because lower income populations tend to have poorer health than more wealthy communities. The effects of CRC construction will have a disproportionate and highly adverse impact on low income children and elderly residents who have less capability to tolerate challenges to their health without dire consequences and lack the financial resources to personally mitigate harm resulting from CRC construction.

- **Through public participation the residents of HIMHC made it clear that their community was EJ and was being overlooked, CRC cannot claim the methodology used was a simple oversight.**

- CRC has failed to use a consistent methodology when identifying low-income and minority communities who would be disproportionately impacted. The use of inconsistent methodologies is suspicious and gives the appearance that CRC intentionally used a different methodology solely for determining low income status in Portlanders with the goal of denying HIMHC their rightful status as an environmental justice community. Using census tracks effectively denied, ignored, and took advantage of HIMHC, a low income elderly population.

P-073-010

- We are all aware that HIMHC community has been targeted due to their low income status. The project staging area was not, and would not be considered in an affluent community like the eastern side of Hayden Island. In the United States of America it is morally reprehensible to try and hide HIMHC's environmental justice status, a goal that is required by presidential executive order 12898. By using a methodology that would hide their low income status CRC has violated NEPA. Knowing increased death will result in a poor elderly community, where death would not occur in a wealthier and healthier community, CRC has essentially takes the position that the lives of the poor have no value. If this is the position of the CRC it should be stated openly. Value of life should not be measured by socio-economic status.

- The cost of living varies from state to state/city to city, it is higher in OR and WA than many other states and using the federal poverty line covers up low income communities in a state with a higher cost of living. The methodology used by the CRC in determining the demographic characteristic of the community is invalid and masks the true nature of the community as significantly low-income relative to the City and County median household income.

- The CRC has failed to accurately determine low income communities given the outdated data used. Since 2000, unemployment has doubled, availability of jobs has decreased, and the economy is significantly depressed. Using outdated statistical information overstates the current financial reality of HIMHC residents. This is unacceptable given that the CRC surveyed some communities for income levels but did not do so for HIMHC, who continually voiced concern of being overlooked as a low income environmental justice community. The limited date CRC chose to collect, using 10,000.00 increments, effectively masked HIMHC's environmental justice status by forcing residents to claim a higher income bracket that does not accurately reflect financial reality. HIMHC has 1,300 residents which include over 100 children; it would not have been over burdensome to survey the actual income of this community. If such a survey would have been done HIMHC would be considered an environmental justice community.

- One of the aforementioned objectives is to specifically target minority, low-income, and limited English-speaking populations within the project area for stakeholder outreach and feedback. Stakeholders that have been identified are;

Low-income residents, minorities, and people speaking limited English (Spanish, Russian, Vietnamese), as identified in the 2005 demographic analysis for the Bridge Influence Area. . In the FEIS the CRC states that all NEPA requirements have been met or exceeded for public involvement, including **Executive Orders 12898 and 12948, which require each federal agency to make achieving environmental justice part of its mission "by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on**

P-073-010

minority populations and low-income populations." If this is the case, then shouldn't block group date been used on Hayden Island because of the income disparity that exists?

G. ADDITIONAL ISSUES

- Jim Howell's Common Sense Alternative was never considered as an alternative in the DEIS or FEIS. This alternative projected to cost half as much as the LPA, 1.8 billion instead of 3.6 billion. This is a significant difference given that the CRC project will actually cost 10 billion once all promissory notes and debts are paid. It is unacceptable that the CRC did not make a good faith effort to consider all alternatives especially since it is the tax payers who will bear the brunt of this debt.

- The CRC failed to consider Jim Howell's CSA which should have been considered because CSA will cost half as much, would not cause a 5-10 year increase in traffic and disruption on I-5 and would not take away the Safeway on Hayden Island, a vital resource for a low income community. Additionally, using this alternative does not focus on an enlargement and shift westward of the I-5 bridge and therefore would not have a highly adverse and disproportionate impact on the low income elderly HIMHC, a community least able to tolerate the effects of CRC construction without severe illness and death.

- The CRC Task Force voted on the LPA before looking at over 15,000 public comments. This is a violation of NEPA which requires public participation. Asking for comments is not enough; the CRC must additionally thoroughly read and respond adequately to these comments to meet public participation requirements.

- It is unacceptable that METRO preapproved the FEIS before it came out to the public. This again is a violation of NEPA because METRO approved the CRC project without even considering public comments and thus did not allow public participation.

- NEPA requires that the DEIS and FEIS be "plain and concise." The average person that has no technical training or special degree will not be able to read the FEIS and understand what this document means. The document as a whole is not plain or concise. The FEIS is not written in plain language that helps a reader understand the FEIS as a whole.

CONCLUSION

As a resident of Portland I find it alarming that such a vulnerable community, HIMHC, is being treated with such disregard. This offends me on an individual level, as a human being, and as a citizen of the United States of America. This poor community is being ignored, a sheep thrown to wolves. It is unethical to put a construction site within a stone's throw of a community

P-073-010

who will be devastatingly harmed by the well documented severe health consequences; including death caused by chronic stress, unnecessary injuries (hip fractures), increased asthma attacks, difficulty breathing, as well as dust, pollution, leaking chemicals, air borne asbestos/lead, particulate matter from diesel fuel, soil contamination, and water contamination, this list is not exhaustive. Thunderbird Hotel will end up a super fund site because CRC feels free to add to existing pollution without any semblance of responsibility to clean up their mess or the known pre-existing pollution at Thunderbird which will be compounded with new pollution caused by CRC construction.

- Do not let CRC overlook existing and valid environmental justice communities, including HIMHC. HIMHC deserves environmental justice status, and this is not the only group overlooked.
- The Thunderbird Hotel should be removed as an option for a construction staging ground.
- CRC should not be able to let a construction company decide where to place a staging ground in order to pass the buck and blame a private party instead of the real culprit the CRC.
- Nancy Body admitted on 10/20/2011 "there is so much still unknown." How dare the CRC release the FEIS with so many contingencies unknown.

Make CRC go back to the drawing board, be accountable to the public and make actual final decisions like; (1) LPA option A or B, (2) where exactly will the construction sites be, (3) what is the actual total pollution level, (4) including all existing pollutants in the air, not arbitrarily limiting it to vehicle emissions in the project area, (5) determine if we are putting too much pollution into one area, (6) is the project, as currently designed, truly addressing the problem and offering a progressive solution, (7) how much will the tax payers actually have to pay 4 billion or 10 billion, (8) admit HIMHC is an EJ community, (9) keep the Safeway, (10) consider building a new bridge and only upgrade I-5 for earthquake safety, (11) enhance public transportation, put that 4 billion towards education instead of a bridge. RESPECT the voice of the public. Leave I-5 alone.

After reading the FEIS I personally feel that CRC should start over. They did a very poor job, CRC over looked important environmental concerns, lied to the community, misrepresented

P-073-010

themselves and their intentions, have not made a valid effort to protect minorities and the poor (low income communities) or endangered species. The CRC is taking away over 60 million in annual revenue from Hayden Island, in a bad economy this is a very poor decision. CRC is forcing 643 people onto unemployment benefits, another expense put on the tax payers bill. Do not let the CRC continue to harm Oregon.

Respectfully,

Concerned Oregonian

Hines, Maurice

From: Kelly Meunier [kmeunier@willamette.edu]
Sent: Sunday, October 23, 2011 3:00 PM
To: Columbia River Crossing
Subject: FEIS comments
Attachments: Victor Veits Comments.pdf

NEW Columbia River Crossing (CRC) Final Environmental Impact Statement (FEIS) Issues for Hayden Island --Victor Viets 10/13/11

P-074-001

1. Arterial Bridge is now optional. The East Side Multi-Use Path (MUP) is now an option in combination with the arterial bridge. These are the only options in the entire project. The arterial bridge is listed as the preferred option but no basis for future final decision is provided.

2. Project will now displace 39 island businesses serving primarily local clientele at a loss of $62.7 million in annual sales and 643 local jobs. "New" business displacements announced in the FEIS include The Chevron station, the car wash, Taco Bell and the Wells Fargo Bank.

3. The HI LRT Station is now shown as a standard TriMet design without a station shelter. The designs that were developed by the PWG with extensive community input are not included. There is no discussion of local handicapped parking and no mention of closure of the existing park and ride at Expo station. There is no discussion of an east-west shuttle bus service to help Island residents get to a LRT (light rail train)
station or to any regional bus stop during construction.

4. Storm-water Treatment Wetlands now occupy the entire site of the new local retail center shown in the Island Plan but this is NOT identified as an impact to the community. We have repeatedly asked CRC to move these treatment facilities to comply with the Island Plan.

P-074-002

5. For some reason, the Arterial bridge option uses the entire Safeway site for storm-water treatment while the no-arterial-bridge does not.

P-074-003

6. Hayden Island now has the longest construction time for the entire project-------
-5-1/2 years. Construction noise (including pile driving) and air quality impacts during construction seem to be ignored.

P-074-004

7. The waterfront park areas identified in the Island Plan are not included and part of the proposed park area is used for additional stormwater treatment ponds. This is not identified as an impact on the community. We have repeatedly asked for this state-owned-land to be made available for park use. On the Vancouver side, the project has created park areas at the bridge landing and donated surplus stateowned-land for park use.

8. The FEIS makes a case that the Island community will benefit significantly from the project and that final design will be consistent with the Island Plan. No long-term impacts on community liveability are identified. This has not been

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P-074-001

The Portland Working Group (PWG) was formed in May 2009 to advise the project on transit related issues for the Oregon side of the project, using the LPA and Hayden Island Plan as the basis for discussion. Beginning in September 2009, the PWG held a series of three interactive design workshops and Open Houses with CRC project, TriMet, the City of Portland staff and the general public to develop a set of design principles. The design principles were developed in such a way as to capture the community's values while remaining broad enough to apply to the future station design regardless of CRC project decisions that may affect the position of I-5, local road circulation, and land development patterns.

The resulting Hayden Island Light Rail Station Conceptual Design Report published January 2010 provides guidance to the CRC project, TriMet, and the City of Portland regarding the Hayden Island station design. PWG members reviewed and approved the report. The Conceptual Design Report solidified the Hayden Island Light Rail Design Principles.

The Hayden Island LRT station cross sections in the FEIS show a conceptual design with place holders for station elements. The illustrations show the Hayden Island LRT station as an elevated station with a center platform. During final design, CRC is committed to working with the community to advance the station design.

At the December 2010 PWG meeting, TriMet representatives discussed bus service. TriMet will work closely with the contractors during CRC construction to ensure that Line 6 continues service to Hayden Island. When developing a bus service plan along a new light rail line, TriMet re-evaluates all bus service within the vicinity of the new line with the intention of maximizing ridership and limiting service duplications. As part of this process, TriMet conducts ridership, cost, and operational analyses.

P-074-004

demonstrated given the facts:

-The island will be cut in half by a very un-neighborly concrete barrier that will extend across the entire island and will be 4-6 stories high and several city blocks wide.

-The project will displace virtually all of the locally oriented retail businesses with a loss of 643 local jobs. The losses will include the only grocery store providing full service meat and fresh produce departments, the only gas station, the car wash, one of the two banks, and virtually all the local restaurants.

-The project will preclude future development of the neighborhood retail center called for in the Island Plan and appears to deny public use of the state-owned-lands for planned shoreline parks.

-The project will permanently displace numerous floating residents and will result in loss of local jobs for many Island residents.

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The project will work with TriMet and the Hayden Island community to develop a bus and circulator service plan during construction and after light rail opens in 2019. On-street parking is shown in the current roadway designs for Tomahawk Island Drive. The project will work with the City of Portland and the Hayden Island community to refine the parking designations near the LRT station. Delta Park will serve as the nearest park and ride to the Hayden Island light rail station, a distance of 1.17 miles from the Hayden Island light rail station. The distance between the park and ride lots at Expo Center and Delta Park is 0.69 miles.

P-074-002

With Option A, the multi-use path generates some additional stormwater, which must be managed nearby. Also, the design for Option A evolved beyond the design assumptions in Option B. Option A has been selected in the Record of Decision.

The stormwater facilities shown in the FEIS will continue to be refined as design work progresses. Under the terms of the Biological Opinion, the CRC project must treat stormwater runoff using bioretention, bioslopes, infiltration ponds, porous pavement, constructed wetlands, and vegetated and soil amended swales designed for infiltration. Stormwater runoff is currently not treated before being released to the North Portland Harbor or Columbia River.

P-074-003

Construction-related noise and air quality impacts are discussed in Chapter 3 of the FEIS. The project recognizes that these impacts could disturb and otherwise affect residents and has identified mitigation measures to reduce those impacts. Mitigation commitments are described in the ROD and will be further developed during final design. There will be on-going coordination with local residents on this issue.

P-074-004

Regarding the Proposed Parks

The transfer of 0.4 acre of surplus land to the City of Vancouver is mitigation for the project's direct impact on the City's existing Waterfront Park, an existing public park and a Section 4(f) resource. The project has no impact to public parks on Hayden Island and therefore no need for such mitigation. The CRC project does not currently propose to convert the existing Thunderbird site on Hayden Island into a public park, but it also does not preclude it from becoming a public park in the future. Decisions regarding the disposal of surplus property after project construction will be made at a later date.

Regarding the I-5 "Barrier"

Though the project will be higher than the existing facility, the LPA design will be less sprawling across the landscape. Currently, land is unable to be used as it is within DOT right-of-way, inside the ramp loops. The LPA will not use this type of design and will not require these large loops.

Regarding Displacements

Refinements and new information resulted in additional displacements. We do not expect that all the businesses assumed to be displaced will necessarily have to be displaced, but it is prudent to be conservative about impacts in the NEPA process. Also, some of the displacements would be affected only by diminished access, not by demolition. It is possible that some of these properties and buildings could be re-occupied by other businesses that would not be so affected by the revisions in access.

Regarding Stormwater Ponds

The stormwater facilities shown in the FEIS will continue to be refined as design work progresses. Under the terms of the Biological Opinion (BO), the CRC project must treat stormwater runoff using bioretention, bioslopes, infiltration ponds, porous pavement, constructed wetlands, and vegetated and soil amended swales designed for infiltration. Stormwater runoff is currently not treated before being released to North Portland Harbor or the Columbia River. The Hayden Island Redevelopment Plan states that runoff from local streets will be treated in roadside planters and that CRC stormwater will be managed in a "green, state-of-the-art manner." It is unfortunate that the HI Plan map did not show the constructed wetlands, a "green" concept for stormwater treatment that has been shown in our documents as early as May 2009. The stormwater treatment proposed in the FEIS does include the "green streets" approach proposed in the Hayden Island Redevelopment Plan to the extent feasible. This approach to stormwater treatment is not suitable for streets located under bridges (where it will be difficult to establish plants) or where streets are at or below the seasonal high groundwater table. In addition, care was taken to ensure that the facilities are located on land that is either currently owned by ODOT or would need to be acquired for CRC construction, independent of stormwater management. The current proposed water quality facilities fulfill that requirement. While wetlands are typically permanent bodies of water, they are not stagnant. Water flows through them during frequent rainfall events, producing conditions that are not conducive to mosquito larval development. As stated above, a constructed wetland is one of the BMPs listed by NMFS in its BO as providing the level of treatment necessary to protect endangered species found in the Columbia River. As such, the discharges are considered by the agency to meet its stringent requirements. We will be further evaluating the potential for infiltration. We will continue to review the developing design to determine

whether additional streets lend themselves to this method of runoff treatment. The project will need to deal with runoff from almost 28 acres of impervious area comprising I-5 pavement across Hayden Island, associated ramps, elevated transit guideway, and structures.

Hines, Maurice

From: Sharonnasset [sharonnasset@aol.com]
Sent: Monday, October 24, 2011 2:51 PM
To: Columbia River Crossing
Subject: This is to be added to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

P-075-001

This is to be added to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

I sent in over 420 pages and data of false and inaccurate statements by the Columbia River Crossing staff during the DEIS. I have NEVER received any answer to the packages I sent in ….. I EXPECT !!!!!!!!!!! to receive an answer on each and every question with honest verifiable data. I expect every piece of data to be placed in the final Environmental Impact Statement.

Sharon Nasset
CEO Third Bridge Now
503.283.9585
Sharonnasset@aol.com

P-075-001

Please see the responses to Ms. Nasset's comments made on the DEIS: P-0781, P-0797, P-0936, P-0977, P-1058, and P-1168. These comments and responses were published with the Final EIS on September 23, 2011.

Hines, Maurice

From: Sharonnasset [sharonnasset@aol.com]
Sent: Monday, October 24, 2011 8:33 PM
To: Columbia River Crossing
Subject: rmal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project. -2
Attachments: ccc_nepa_not_followed.TIF; CRC_Sponsor_Responsibilty.doc; 2-FTA questions removal of projects.doc

Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

COLUMBIA RIVER CROSSING ALTERNATIVES, FORECASTING METHODOLOGY, AND RESPONSE TO QUESTIONS
(from Federal Transit Administration)
Dec. 8, 2006 page2

P-076-001

The CRC project team has presented its recommendations for which alternatives should proceed into the DEIS to the CRC Task Force, a 39-member panel of community representatives, business representatives and elected officials who oversee the project, at their November 29th meeting. This narrowed set of alternatives will be carried forward through a public input period prior to beginning the DEIS process. Following two months of intense public outreach efforts aimed at sharing these alternatives with the public and gathering their input, the CRC Task Force will review the public comments and make their final recommendations on the DEIS range of alternatives at the February 27, 2007 meeting. This refined set of alternatives will be fully documented in the Detailed Definition of Alternatives report which will include plan and profile drawing sets that establish the footprint of the project for the DEIS, targeted for the Spring of 2007.

CRC Staff makes false statements to the FTA

1. The CRC Task Force was an advisory committee to the Project Sponsor's Council an advisory committee to the Signatory CRC Sponsor Agencies. The CRC Task Force was NEVER an oversight committee.

2. The alternatives were removed without following the NEPA process of a thorough study

3. The alternatives were removed before define or being refined

4. The alternatives were removed before and only the "narrowed " alternatives carried though for citizen input. Citizen and work groups did not see all the alternatives. The CRC Task Force did not see refined alternatives before removing them.

5. Only the narrowed alternatives were refined or fully documented

6. The Board of Clark County Commissioners letter attached states concerns about the November 29th meeting that removed alternatives. " The Board of Clark County Commissioners believes that that the NEPA process is substantially flawed and recent action taken by Columbia River Task Force is arguably illegitimate.

All alternatives highway, transit, and rail were removed by the CRC Task Force advisory committee.

Sharon Nasset
CEO Third Bridge Now
503.283.9585
Sharonnasset@aol.com

P-076-001

The CRC Task Force was advisory. The text stating that they oversaw the project was an error. Regarding the letter from the Clark County Board of Commissioners, the decision the Task Force made at its meeting on November 29, 2006, was not their final recommendation of alternatives. It was a decision to forward a set of alternatives to the public for additional input and comment, prior to the Task Force voting on a recommendation of alternatives in February 2007. Following this letter, the Clark County Commissioners were subsequently afforded additional opportunities to ask questions about and provide input on the range of alternatives. At its meeting on February 27, 2007, with Clark County Commissioner Steve Stuart participating, the Task Force made its recommendation on alternatives to advance to the DEIS. The motion passed with 33 members in favor, none opposed and no abstentions.

Please see responses to Ms. Nasset's other comment letters submitted on the FEIS, including letter P-077 regarding the RTC letter and the Board of Clark County Commissioners' letter, and letter P-079.

2439

BOARD OF CLARK COUNTY COMMISSIONERS
Betty Sue Morris • Marc Boldt • Steve Stuart

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CLARK COUNTY
WASHINGTON

1300 Franklin Street • P.O. Box 5000 • Vancouver, WA 98666-5000 • tel: [360] 397-2232 • fax: [360] 397-6058 • www.clark.wa.gov

December 18, 2006

Mr. Douglas B. MacDonald
Secretary of Transportation
Washington State Department of Transportation
Post Office Box 47300
Olympia, WA 98504-7300

P-076-001

Dear Secretary MacDonald:

We write to share our concerns regarding the National Environmental Policy Act as it relates to the Columbia River Crossing project. The Board of Clark County Commissioners believes that the NEPA process is substantially flawed and any recent action taken by the Columbia River Task Force is arguably illegitimate.

On the evening of Wednesday, November 29th, the Columbia River Task Force met in regular session. During the proceedings, the Chairman, Hal Dengerick, deviated from the agenda by accepting a motion from Rex Burkholder Burkholder "to accept the project team's recommendations… and forward the report to the public for comment." The motion was seconded, voted on, and passed.

The Board of Clark County Commissioners takes objection to this deviation. The agreed upon and predetermined process would have allowed each member of the Task Force to go back to their respective bodies and present the staff alternatives. The motion as passed denied Clark County this opportunity.

Unfortunately for the residents of Clark County and the customers of C-Tran, Commissioner Stuart and Commissioner Morris had to depart the meeting early to attend the Clark County Planning Commission hearing on the Comprehension Growth Management Plan. Since there was no prior notification, each Commissioner was unaware of the vote and therefore, had not appointed an alternate to vote on their behalf.

The Board believes that a decision of this magnitude should have followed the agreed upon process. We should have had plenty of advance notice and a printed copy of the text. We believe this vote undermined the integrity of the NEPA process, for there needs to be a higher degree of consensus, and not a vote that was passed marginally or for the ease of a few.

On a night in which Governor Gregoire addressed the Task Force as a whole and urged our region to not be competitors but partners in the CRC project, we find it inappropriate what transpired. Over 400,000 residents live in Clark County, and as the duly elected Board, we find it unacceptable to be left out of this process. Therefore, we seek a fair and objective analysis as well as a reasonable opportunity to comment on the project. There needs to be a frank and honest discussion about the staff recommended alternatives, and Clark County needs to be involved.

Sincerely,

Marc Boldt
Chair

Betty Sue Morris
Commissioner

Steve Stuart
Commissioner

2439

WHO IS INVOLVED?

P-076-001

A project of this size and complexity must, of necessity, bring together many stakeholder groups with a wide range of interests. Each of these groups has a unique role to play in the decision-making process. Some provide the technical data needed to compare alternatives while others help compare and choose the alternatives.

Project Development Team

Responsible for day-to-day project management. Working groups will assist the team with specific issues such as freight, public involvement, and financing issues.

Regional Partners

Advises Project Development Team and assists with project development. Includes major public agencies with transportation jurisdiction within the project area:

- Oregon Departments of Transportation (ODOT)
- Washington Department of Transportation (WSDOT)
- Metro
- Southwest Washington Regional Transportation Council (RTC)
- TriMet
- C-TRAN
- City of Portland
- City of Vancouver
- Federal Highway Administration (non-voting)
- Federal Transit Agency (non-voting)

Task Force

39-member group of representatives from a broad cross section of the Oregon and Washington communities, including public agencies, businesses, civic organizations, neighborhoods, and freight, commuter, and environmental groups. Provides recommendations to the Project Sponsors Council.

Project Sponsors Council

Makes decisions at each decision point based on recommendations from the Task Force, public input, and advice from Project Development Team:

- WSDOT
- ODOT
- RTC
- Metro
- C-TRAN
- TriMet
- City of Vancouver
- City of Portland
- Clark County
- Multnomah County
- Port of Vancouver
- Port of Portland

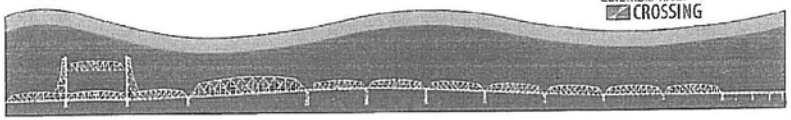
Bi-State Permitting and Regulatory Group

Coordinates and streamlines regulatory reviews and permitting. The group includes federal, state, and local agencies responsible for protecting air, water, wildlife, and cultural resources.

Federal Highway Administration and Federal Transit Administration

Co-lead agencies for the National Environmental Policy Act (NEPA) process that governs proposed actions requiring federal funding, federal permits, or federal approvals. Will sign the Environmental Impact Statement and Record of Decision.

Columbia River CROSSING



Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

COLUMBIA RIVER CROSSING ALTERNATIVES, FORECASTING METHODOLOGY, AND RESPONSE TO QUESTIONS
(from Federal Transit Administration)
Dec. 8, 2006 page2

P-076-001

The CRC project team has presented its recommendations for which alternatives should proceed into the DEIS to the CRC Task Force, a 39-member panel of community representatives, business representatives and elected officials who **oversee the project,** at their **November 29th meeting**. **This narrowed set of alternatives will be carried forward through a public input** period prior to beginning the DEIS process. Following two months of intense public outreach efforts aimed at sharing these alternatives with the public and gathering their input, the CRC Task Force will review the public comments and make their final recommendations on the DEIS range of alternatives at the February 27, 2007 meeting. **This refined set of alternatives will be fully documented** in the *Detailed Definition of* Alternatives report which will include plan and profile drawing sets that establish the footprint of the project for the DEIS, targeted for the Spring of 2007.

CRC Staff makes false statements to the FTA

1. The CRC Task Force was an advisory committee to the Project Sponsor's Council an advisory committee to the Signatory CRC Sponsor Agencies. The CRC Task Force was NEVER an oversight committee.
2. The alternatives were removed without following the NEPA process of a thorough study
3. The alternatives were removed before define or being refined
4. The alternatives were removed before and only the "narrowed " alternatives carried though for citizen input. Citizen and work groups did not see all the alternatives. The CRC Task Force did not see refined alternatives before removing them.
5. Only the narrowed alternatives were refined or fully documented
6. The Board of Clark County Commissioners letter attached states concerns about the November 29th meeting that removed alternatives. " The **Board of Clark County Commissioners believes** that that the **NEPA process is substantially flawed** and **recent action taken** by Columbia River Task Force **is arguably illegitimate.**

All alternatives highway, transit, and rail were removed by the CRC Task Force advisory committee.

Sharon Nasset

CEO Third Bridge Now
503.283.9585
Sharonnasset@aol.com

Hines, Maurice

From: Sharonnasset [sharonnasset@aol.com]
Sent: Monday, October 24, 2011 9:52 PM
To: Columbia River Crossing
Subject: Public Comments Environmental Impact Statement concerning the Columbia River Crossing project. -3
Attachments: CCC-letters201010CitizenDocs-2.pdf; RTC_letter_Third_Bridge_Now_not_studied.pdf; newpaper_St._Johns'.pdf; RC-14vsThirdBridger4c.pdf

P-077-001

Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

In the NEPA Scoping process the Bi-State Industrial Corridor a new freeway inside the I-5 Corridor was an alternative. The staff down-grade the alternative, change it's size, length, location and made FALSE STATEMENTS! CRC continues to make false statements to committees, elected officials, and US Legislators. Reasonable alternatives were removed without following the NEPA and CRC procedures. This and other reasonable alternatives have less impact and more benefits than the current "Locally Preferred Alternative"

1. Letter from the Broad of Clark County Commissioners that our project was removed from the CRC project without being vetted. The Clark County Commissioners sit on the RTC and CTRAN boards both CRC Signatory Sponsor Agencies.

2. Letter from the SW WA Regional Transportation Council that our project was removed from the CRC project without being vetted. RTC is a CRC Signatory Sponsor Agency.

3. St. Johns' Review newspaper article Aug 2005 clearly states our project as a freeway.

4. This is a comparison page showing the different between our project and the project CRC staff tried to pass off as our project. The CRC staff continues telling the lies that they studied our project

5. Over 800 signature of citizen wanting our project put back into the process and be thoroughly studied immediately, were handed into CRC staff and they provided not process and refused to put our project back into the NEPA process

Explain exactly why OUR PROJECT Was not thoroughly studied and why was it not put immediately studied. The NEPA process of a range of alternatives thoroughly studied and that All reasonable alternatives must be

1

P-077-001

Many options and alternatives were considered as part of the evaluation process for the CRC project. Only those proposals that could adequately meet the purpose and need were advanced into the DEIS. A number of bypass options and new river crossing locations were studied, and although they would provide some transportation benefits, they could not meet some of the basic elements of the purpose and need for the CRC project. Heavy rail and commuter rail options were also studied in the early alternatives analysis process. These modes and alignments were found to fail to meet the location and service needs of the transit market and so were not advanced, as discussed in the FEIS.

The evaluation and screening of alternatives prior to the DEIS reviewed a range of potential I-5 bypass options with new river crossing locations. This analysis found that building any of the bypass options with new river crossings, in place of making I-5 improvements, would fall far short of meeting basic elements of the proposed action's purpose and need, as discussed in Chapter 2 of the FEIS. The range of bypass/new crossing options studied at that time was wide enough to draw fundamental conclusions about this type of alternative, regardless of refinements that might be made to bypass connection points with I-5, the bypass alignment, or its crossing location. It is not necessary to study every possible bypass connection point, alignment, lane configuration, or new river crossing location, or combinations thereof, to understand the fundamental performance deficiencies of this type of alternative, relative to the CRC purpose and need; without improvement to the I-5 corridor and crossing, bypasses and new crossing locations can not meet basic elements of the proposed action's purpose and need. Many of them can provide benefits, but they can not adequately address basic needs identified by the region for this project.

Alternatives that do not adequately meet the purpose and need are not advanced into the EIS.

P-077-001

studied did not take place.

Because of CRC staff continued dishonest and false statements about our project was renamed from Bi-State Industrial Corridor to Third Bridge Now!

Sharon Nasset
CEO Third Bridge Now
503.283.9585
Sharonnasset@aol.com

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

Please see responses to Ms. Nasset's comments on the DEIS (P-0781, P-0797, P-0936, P-0977, P-1058, and P-1168), which were published with the FEIS and included on the CD with the FEIS summary document. Please also see Section 2.7 of the FEIS and the responses to Ms. Nasset's other comments on the FEIS including letters P-075 to P-083.

P-077-001

REVIEW

Arbor Lodge - Bridgeton - Cathedral Park - East Columbia - Hayden Island - Kenton - Linnton - Overlook - Piedmont - Portsmouth - St. Johns - Sauvie Island - University Park

August 26, 2005 North Portland's Community Newspaper - Founded in 1904 Vol. 101 * No. 17

North Portland group expresses own ideas and solutions for improving I-5 traffic

By Gayla Patten
The REVIEW

Truck traffic through St. Johns, and the traffic along I-5 continue to be a main topic of discussion and concern. Millions of dollars has been spent, and continues to be spent, by working groups in hopes of finding the best solution to improve congestion and mobility. Everyone agrees the I-5 corridor will face significant congestion by the year 2020, which will without doubt adversely affect the livability and economic potential of the Portland/Vancouver area.

Two active groups have come up with plans they feel would most benefit the North Portland area . . . there are however, no similarities between the two groups' participants or their ideas, but their goals are the same: to improve the I-5 commute made by citizens and trucks, which will improve the region's economy and livability and also make the area a safer place to drive.

The first is a government task force and has an impressive slate of members from Oregon and Washington. It's called the Columbia River Crossing Task Force (CRC). They have been meeting since 1998 and are formed from three previous task forces.

The 2nd is a private, nonprofit group called The Economic Transportation Alliance (ETA). It is an informed and concerned group of community citizens.

Both groups have spent endless hours studying their proposals. Their studies are complex, but in the simplest terms possible, include the following results for improvement:

The CRC's recommendation is a new bridge in place of the current Interstate Bridges, widening sections of I-5's lanes and improving on/off ramps.

The ETA's plan includes two long bridges, a shorter bridge and a new freeway from the Port of Vancouver, across west Hayden Island to the Rivergate Industrial area, then across the Willamette River to U.S. 30 north of the St. Johns Bridge.

ETA members say their plan would not be cheaper than the CRC Task Force's, but it would better improve many bottlenecks between the Marquam Bridge and Columbia Boulevard by creating new routes that more efficiently move commuters and cargo. The group's proposal is creative with interesting designs and has the support of several area politicians and business leaders.

Sharon Nasset is a well known North Portland resident and real estate agent, and a member of the ETA. She said many previous decisions made by groups were based on the fact they thought the Interstate Bridge was in bad shape and needed major renovations or replacement. However, later reports said that its structure was sound and would be good for another 50 years. The ETA's plan would preserve the I-5 Bridge but downriver from it, at the Port of Vancouver area, would be a triple deck bridge with six lanes for cars on the top deck, trucks using the center span, and rail, Amtrak and perhaps a light rail line, using the bottom deck.

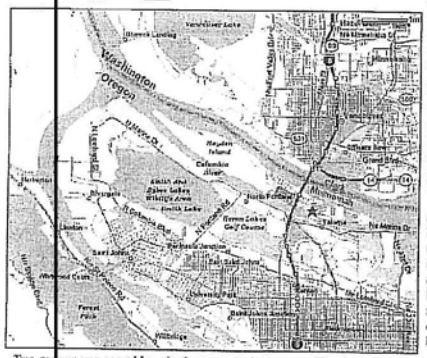
The bridge would continue across West Hayden Island and connect to the mainland via a shorter bridge. The new route would then pass through the Rivergate Industrial area, and cross the Willamette River near Linnton. This bridge would be for cars and trucks only. The route would then use a new freeway paralleling the Old Portland Highway and Columbia Boulevard.

Oregon Department of Transportation is currently in the process of completing an Environmental Assessment document for the I-5 Delta Park to Lombard section which is expected to be released October 2005. There will be a 45-day public comment period and a public hearing at the end of October after which ODOT will select a final alternative. Federal Highway Administration approval is expected in the spring of 2006 and construction is anticipated to begin in 2008.

Time will tell if Nasset and her group will be heard by the Task Force. But North Portland's many dedicated, well informed citizens, who have won many important battles the last ten years, may dictate that it should at least be listened to and considered.



Sharon Nasset, North Portland resident, is part of a group called The Economic Transportation Alliance. They have an imaginative solution for improving I-5 traffic and truck traffic through St. Johns.



Two groups are searching the best way to improve traffic along I-5. The Columbia River Task Force would like to replace the I-5 bridge, create more lanes and improve some on-ramps, among other things; The Economic Transportation Alliance would like to put a three-deck bridge from the Port of Vancouver, across Hayden Island, and pass through the Rivergate industrial area to Linnton.

THIS ISSUE

Letters to Editor
From the Editor
Community News
Crossword Puzzle & Sports
Business & Service Directory; Host families needed
Real Estate
Citywide Classifieds

[redacted]

In June planning for the future of 1.2 acre Patton Park on Interstate, just south of Killingsworth, began with a community survey, followed by a design workshop.

A survey was sent to addresses surrounding the park and asked opinions about the park's future. PP&R reported that it was obvious to them that the park gets a great deal of use from neighbors and there was a strong interest in keeping it and adding some upgrades and enhancements.

The St. Johns Review, Inc. 315-840, 2209 N. Schofield, Portland, Or. 97217

[redacted]

P-077-001

Group offers detour from plan for new I-5 bridge

A private alliance says Washington and Oregon should consider other routes to avoid bottlenecks

Thursday, August 18, 2005

BILL STEWART

The Oregonian

As teams from Washington and Oregon start to plan for a new $1 billion Interstate 5 bridge, a private, nonprofit group is turning up the volume on its warning that the bridge is going in the wrong place.

The Economic Transportation Alliance, which is composed of concerned residents and which has no ties to government groups, says its plan wouldn't be cheaper, but it would eliminate bottlenecks on Interstate 5 by creating new routes that more efficiently move commuters and cargo. Its blueprint includes two long bridges, a shorter bridge and a new freeway from Vancouver's port area across west Hayden Island to Rivergate Industrial Area, then across the Willamette River to U.S. 30 north of the St. Johns Bridge.

Conversely, an I-5 proposal being prepared by officials from Oregon and Washington is in the wrong place, according to the alliance, because it does nothing to eliminate the bottleneck in Portland from Columbia Boulevard to the Marquam Bridge. That plan calls for 10 bridge lanes narrowing to six lanes at either end.

The bi-state team is following the directives of three consecutive task forces -- dating to 1998 -- on congestion and freight delays. The alliance, whose plan has drawn the support of several area politicians and business leaders, is using excerpts from the same reports to argue that a wider bridge in the same place solves nothing.

"Many of the earlier decisions were based on the expectation that the Interstate bridges were crumbling, in bad shape," said Sharon Nassett, a Portland resident who has been publicizing the alliance's highway route for several years. "And then the report came out saying the old bridges would last another 50 years, that they are structurally sound, but we are stuck with the incorrect assumptions" that the bridges are failing.

Austin Pratt, regional bridge permit supervisor for the U.S. Coast Guard in Seattle, said unresolved issues include limiting the height so the bridge is not a threat to planes using Pearson Field or Portland International Airport, deciding how much clearance is needed by boats, and lining up a boat channel so

He noted that one reason for all the studies was to eliminate the sole freeway lift span between Canada and Mexico. However, the bi-state team recently presented to regional transportation officials sketches of plans that included as many as four lift spans.

"I don't think the Federal Highway Administration will approve that," Pratt said. He said the lift spans can stay if the two old bridges remain.

The alliance proposal calls for preserving the I-5 bridge but adding a single-span, triple-deck bridge just west of Vancouver's Amtrak depot, where the Fort Vancouver Plywood mill once stood. Early drawings show a single arch with no in-stream piers for boaters to dodge, and no lift or turntable opening area.

The triple-level bridge would include six lanes for cars on the top deck and six lanes for trucks on the middle level. The bottom deck would include six rail tracks -- four for freight trains and Amtrak, and two available for light rail. The plan also would need a shorter bridge south from Hayden Island across the Oregon Slough, and a high, long bridge over the Willamette River.

One supporter of the alliance plan is Tom Mielke, Republican candidate for Clark County commissioner. Mielke, a former Washington legislator, said those blindly rushing ahead on an I-5 corridor plan are not using common sense.

"It seems like everyone is too anxious to spend the money," Mielke said. "Some of the problems with building another Interstate Bridge are obvious."

mis infor-mation

Nassett, who is in real estate sales in Portland's St. Johns neighborhood, lost some supporters when she backed away from creating a Westside Bypass through Washington County. And more recently, she's erased a double-decked freeway above the railroad in what BNSF Railway calls the Willamette Cut through St. Johns, saying the old plan did little to get rid of large trucks in St. Johns' residential neighborhoods.

The new version calls for trucks and cars -- but no trains -- crossing the Willamette River near Linnton. That

↑ Yestrains

P-077-001

vehicle traffic would use a new freeway paralleling the Old Portland Highway and Columbia Boulevard.

Another advocate for the industrial route is Portland businessman Paul Edgar, who says the official bi-state study team should be sidetracked before it runs through more than $50 million in federal and state grants for environmental study -- of the wrong route.

While the official team is following directives set out in previous reports -- three through lanes in each direction, two local access lanes in each direction, and some provision for mass transit -- the alliance is using those directives to say wrong place, waste of money.

For example, Don Wagner, regional administrator for the Washington State Department of Transportation, told his state commission, "There physically is no room for additional lanes in the (I-5) corridor."

Wagner, who previously held a similar job for the Oregon Department of Transportation, said I-5 cannot be widened between Lombard Street and the Fremont Bridge.

Minutes of a Washington transportation meeting in 2004 cite Wagner as saying, "Enlarging the Columbia River Bridge will not add capacity to the I-5 corridor."

One controversial aspect of the alliance's plan is the northern link to I-5. It proposes putting trucks and cars in a deep trench along Mill Plain Boulevard and 15th Street. To build the trench, a 5-year-old stretch of concrete -- which cost $36.5 million in 2000 and 2001 -- would be ripped out and overpasses built for surface traffic.

Wagner has speculated it could take 20 years to get the necessary permits and build a new I-5 span, but Nassett has been urging officials to use the work of previous studies. She thinks the alliance's version could be resolved in five years.

Bill Stewart: 360-896-5722 or 503-294-5900; billstewart@news.oregonian.com

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Difference between Third Bridge Now and other alternatives

P-077-001



RC-14 map

CRC River Crossing 14 (RC-14) bi-state industrial corridor

Third Bridge Now

also known as
BI-State Industrial Corridor



B



West Option 4

An arterial "parkway" version of the Bi-State Industrial Corridor

Third Bridge Now

also known as
BI-State Industrial Corridor





An arterial "parkway" version of the Bi-State Industrial Corridor

Information generated by the I-5/ Columbia River Crossing Draft Environmental Impact Statement was consulted for setting the evaluating the Option West 4 Corridor

Third Bridge Now

also known as
BI-State Industrial Corridor



www. Thirdbridgenow.com / Thirdbridgenow@aol.com /503.283.9585

Difference between Third Bridge Now and other alternatives

P-077-001

Third Bridge Now, the original BI-State Industrial Corridor

A mini freeway attaching to I-5 freeway and Mill Plain in Vancouver 6-general purpose lanes, 2-center managed lanes (for emergency vehicles and buses) bike, and ped the entire route. New heavy speed rail bridge with commerce and commuter use. The freeway's alignment attaching to I-5 at Mill Plain, west to Port of Vancouver, south following /BNSF rail line and North Portland Rd., west paralleling Columbia Blvd., to Oil Time Rd. and across to HWY-30 near 124th and Newberry Hill. A tunnel to Swan Island for vehicle, bike, ped, and heavy rail. Vehicle capacity 120,000+, Approximately 7 miles of freeway with 10 on/ off ramps at major intersections.

Third Bridge Now



CRC River Crossing 14 (RC-14) bi-state industrial corridor

A 4-lanes arterial, with lifts, and stop lights. Starting at the Port of Vancouver and ending at Marine Dr. No commuter light rail or heavy rail. Approximately 1mile of arterial, vehicle capacity 30,000, was at capacity upon opening, diverted traffic from I-205, and I-8. It was removed from the NEPA EIS by citizen "advisory" CRC Task Force without a thorough study. There are several errors in the CRC study RC-14, concerning alignment and location.

CRC staff used our name yet changed the project significantly.



SW Washington Regional Transportation Council Visioning Corridor Plan in 2008 studied.

An arterial "parkway" version of the Bi-State Industrial Corridor ** It was recommended for further study.

A 4-lane arterial with lifts, and stop signs, that starts at the Port of Vancouver, follows the BNSF rail line south and to HWY-30 near 124th and Newberry Hill. Does not included our tunnel to Swan Island, no heavy rail commerce or commuter. Staff modeled a 4-lane and a 6-lane arterial. The arterioles carried up to 38,000 to 46,000 vehicles and were at capacity upon opening. Removing traffic off of I-5, I-205, I-84, HWY-26, streets adjacent to I-5 and major industrial areas. The alignment helped St. Johns' area. Extra traffic causes capacity issues in downtown Vancouver. **Information generated by the I-5/ Columbia River Crossing Draft Environmental Impact Statement was consulted for setting the evaluating the Option West 4 Corridor



www. Thirdbridgenow.com / Thirdbridgenow@aol.com /503.283.9585

RTC
1300 Franklin Street, Floor 4
P.O. Box 1366
Vancouver, WA 98666-1366

360-397-6067
360-397-6132 fax
http://www.rtc.wa.gov/

November 15, 2010

Ms. Sharon Nasset
1113 N. Baldwin Street
Portland, OR 97217

Dear Ms. Nasset:

P-077-001

This letter is in follow up to your request about a "third bridge option" being studied and included in CRC's Draft Environmental Impact Study (DEIS). Your specific area of interest is about a project described as a new 6-lane freeway connecting I-5 at Mill Plain, west to the Port of Vancouver, south to Hayden Island, Marine Drive, and connecting with highway 30 near Newberry Hill.

The CRC project references in a March 22, 2006 document, RC-14. RC-14 was a possible transportation alternative in the DEIS. RC-14 modeled a multilane, multimodal bi-state industrial corridor starting near I-5 and Mill Plain crossing next to the current BNSF rail bridge and connecting south to Marine Drive. Traffic analysis of the RC-14 alternative showed that it did not sufficiently relieve traffic congestion to any significant degree on the I-5 Columbian River Bridge and therefore not advanced into the next round of alternatives. In sum, this alternative provided for a new industrial corridor, but did not provide for a major freeway that would adequately address I-5 traffic congestion.

A new freeway corridor alternative corridor was also studied. It was identified as RC-16, a New Western Highway. This alternative functioned as a new freeway bypass to I-5 but did not provide direct freeway access to I-5 via Mill Plain.

It is also worth noting that in 2008 RTC completed a Transportation Corridor Visioning Study (http://www.rtc.wa.gov/reports/vision/VisioningCorridors.pdf) that studied new freeway corridors throughout Clark County per a new 50-year growth scenario and given those corridors how a corridor to the east and west might be connected across the Columbia River.

Given your specific concern as stated above, no a "third bridge option" as a new freeway starting at I-5 and Mill Plain was not fully vetted.

Sincerely,

RTC Chair, Washougal Councilperson Molly Coston

cc: RTC Board of Directors

Member Jurisdictions
Clark County
Skamania County
Klickitat County
City of Vancouver
City of Camas
City of Washougal
City of Battle Ground
City of Ridgefield
City of La Center
Town of Yacolt
City of Stevenson
City of North Bonneville
City of White Salmon
City of Bingen
City of Goldendale
C-TRAN
Washington DOT
Port of Vancouver
Port of Camas-Washougal
Port of Ridgefield
Port of Skamania County
Port of Klickitat
Metro
Oregon DOT
15th Legislative District
17th Legislative District
18th Legislative District
49th Legislative District

Southwest Washington Regional Transportation Council

BOARD OF CLARK COUNTY COMMISSIONERS

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AUG 4 2010

July 23, 2010

The Southwest Washington Regional Transportation Council (RTC)
c/o Ms. Molly Coston, Chair
1300 Franklin Street, 4th Floor
Clark County Public Service Center
Vancouver, Washington 98666-1366

RE: Columbia River Crossing (CRC) Environmental Impact Study / Third Bridge Analysis

Dear Chair Coston and Council Members:

P-077-001

This correspondence is in follow up to a repeated request to RTC by concerned citizens about the lack of a "third bridge option" being studied and included in CRC's Draft Environmental Impact Study (DEIS). The specific area these citizens are interested in includes a new 6-lane freeway connecting I-5 at Mill Plain, west to the Port of Vancouver, south to Hayden Island, Marine Dr., and connecting with HWY-30 near Newberry Hill.

The CRC project references in a March 22, 2006, document, RC-14. RC-14 was used to create a possible transportation alternative in the Draft Environmental Impact Study. RC-14 modeled a multilane, multimodal bi-state industrial arterial or corridor starting near I-5 and Mill Plain, crossing next to the BNSF rail bridge and connecting south to Marine Drive. Traffic analysis of the RC-14 alternative showed that it did not sufficiently relieve traffic congestion to any significant degree on the I-5/Columbia River Bridge and therefore was not advanced into the next round of alternatives. In sum, this alternative provided for a new industrial corridor, but did not provide for a major freeway that would adequately address freeway congestion.

A new freeway corridor alternative was also studied. It was identified as RC-16 (New Western Highway). This alternative functioned as a new freeway bypass to I-5, but did not directly connect to I-5 via Mill Plain. The proposed corridor started near Ridgefield and went around the ports.

Given the specific concern, as stated above, the answer is no. A "third bridge option" as a new freeway starting at I-5 and Mill Plain was not fully vetted.

Sincerely,

Steve Stuart, Chair | Tom Mielke | Marc Boldt

cc: Ms. Sharon Nasset
Ms. Tamara McLane

10/5/10 Referenced by Tamara McLane

1300 Franklin Street • P.O. Box 5000 • Vancouver, WA 98666-5000 • tel: [360] 397-2232 • fax: [360] 397-6058 • www.clark.wa.gov

BOARD OF CLARK COUNTY COMMISSIONERS

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JUL 27 2010

July 22, 2010

The Southwest Washington Regional Transportation Council (RTC)
c/o Ms. Molly Coston, Chair
1300 Franklin Street, 4th Floor
Clark County Public Service Center
Vancouver, Washington 98666-1366

RE: Fourth Plain Boulevard Becoming a Major Freight Arterial/Corridor

Dear Chair Coston and Council Members:

P-077-001

The Clark County Board of Commissioners has been approached by members of the Shumway Neighborhood Association regarding the increasing volume of freight through established residential neighborhoods.

The Shumway Neighborhood Association has been actively working with the Arnada Neighborhood Association, Hough Neighborhood Association, Fruit Valley Neighborhood Association and the Carter Park Neighborhood Association to prevent Fourth Plain Boulevard from becoming a major freight arterial through these established neighborhoods.

While Clark County understands that the area in question is under the jurisdiction of the city of Vancouver, the concerned home and property owners are also located in Commissioner District 3. Thus, their outreach to the Clark County Board of Commissioners.

The Board of Commissioners respectfully asks RTC to include in its current work program a comprehensive freight access study of the entire transportation network west of and in connection with Interstate-5. We further respectfully ask all RTC member organizations to understand these well established residential neighborhoods' concerns for their livability, not to mention potential affects on home and/or property value if Fourth Plain Blvd.'s designation should change. We would hope (1) RTC staff will actively include and work with all of the neighborhood associations and (2) that this work would be completed before any public conversation about the proposed change in Fourth Plain's designation.

Sincerely,

Steve Stuart, Chair | Tom Mielke | Marc Boldt

1300 Franklin Street • P.O. Box 5000 • Vancouver, WA 98666-5000 • tel: [360] 397-2232 • fax: [360] 397-6058 • www.clark.wa.gov

10/5/10 Referenced by Tamara McLane

Hines, Maurice

From: Sharonnasset [sharonnasset@aol.com]
Sent: Monday, October 24, 2011 10:03 PM
To: Columbia River Crossing
Subject: Public Comments Environmental Impact Statement concerning the Columbia River Crossing project. -4
Attachments: non-compliance -4.doc

P-078-001

Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

CRC are seeking non-compliance waves when other project stay in-compliance

The reasons that CRC staff continues to tell committees, citizens, and elected official including members of Congress that the Third Bridge was studied, are ….It was brought in during NEPA Scoping and CRC documents state all reasonable alternative brought in during scoping must be thoroughly studied this is one of the reasons opponents state the NEPA process has not been followed, and a Supplemental Environmental Impact Statement must be started immediately. AND the CRC is seeking wavers from Federal Agencies for non-compliance on issue of Marine Navigation, Aviation, and Historic 4(f) problems that require looking for alternative that stay in compliance.

1. A range of alternatives thoroughly studied though construction is required in the NEPA process, no range of alternatives, equal to the current Locally Preferred Alternatives was studied.

P-078-002

2. The CRC Locally Preferred Alternative removes up to 20 Historical Resources and 11/2 to 2 acres of the Historic Fort Vancouver Reserve, and challenges Pearson Airport airspace. If it is Feasible or Prudent to avoid 4(f) Historic Resource it is required for Federal funding. CRC does not qualify for federal funding.

P-078-003

3. The Replacement bridge, the current Locally Preferred Alternative, does not meet current marine needs of 110' clearance for water traffic business. The Replacement bridge at 95' is less than the current bridge clearance. The I-205 is 130' and the current I-5 bridges are higher than 130'. The CRC's own original data states that a new bridge should not be less than 110' to keep from having adverse impacts on marine traffic. The Third Bridge approximately 1 mile west of the current bridges can be constructed high enough to handle current and future marine needs.

4. The Replacement bridge (depending on design) will need a waiver from the Federal Aviation Administration because it will enter Portland Airport and

1

P-078-001

Please see the responses to Ms. Nasset's comments made on the DEIS (P-0781, P-0797, P-0936, P-0977, P-1058, and P-1168), which were published with the Final EIS. Impacts (adverse as well as beneficial) to navigation, aviation and Section 4(f) resources are described in the FEIS. This includes a discussion and disclosure of the project's ability to comply with related regulations, and any regulatory permits and approvals that will be required. Also see responses to Ms. Nasset's other comment letters on the FEIS, P-075 to P-083.

P-078-002

The project has worked hard to avoid historic impacts and minimize the impacts that are unavoidable. The avoidance activities and Section 4(f) impacts are detailed in the FEIS. The project does not "remove up to 40 historical resources." The State Historic Preservation Offices of both states have concurred that the project will have adverse effects to only three historic (National Register eligible) properties. Additionally, the Lucky Lager Warehouse is currently shown as displaced in the FEIS. Though it is on the Clark County Heritage Register, it has not been deemed National Register eligible. As the designs are refined, the project will continue to seek ways to avoid and minimize impacts to historic properties. The project will also have an effect on numerous archaeological sites, as documented in Section 3.8 of the FEIS.

P-078-003

The project conducted a series of studies and stakeholder outreach to determine the appropriate navigation clearance for the proposed bridges. Many factors were considered to determine the navigation clearance for the proposed bridges across the Columbia River. In addition to vessel height, the safe and efficient operation of aviation (Pearson Field), highway, light rail, and the multi-use path (bicycle and pedestrian) were considered.

P-078-003

Pearson Airport airspace. The Third Bridge approximately 1 mile west of the current bridges can be constructed without entering into the airports' airspace.

P-078-004

5. CRC Need and Purpose Statement requires the state to avoid impacts on private property, business, and communities. CRC is removing or impacting up to 280 piece of property full or particle on Jantzen Beach - up to 29 homes, 39 businesses and added congestion on I-5 Freeway. Third Bridge alignment on Jantzen Beach is bare vacant and publicly owned land and without interruption on the existing transportation system. Several of the properties are values at millions of dollars.

Molly Coston, the former Chair of RTC, signed the letter understanding you will be calling to verify the letter. Council Member Coston phone number is 360.608.0462.

The former Chair of the Clark County Board of Commissioner Steve Stuart signed the letter understands you will be calling to verify. 360.397.2232

P-078-005

Please ask the CRC representative to provide data of a thorough study of a 6-lane freeway with 2 managed lanes, and high speed rail alignment, with the freeway attaching to I-5 at Mill Plain, going into the Port of Vancouver and connecting to HWY-30 near Linnton OR. The data is to be credible and verifiable, with on and off ramps at each arterial crossing.

Sharon Nasset
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CEO Third Bridge Now
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Sharonnasset@aol.com

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*** IMPORTANT: Do not open attachments from unrecognized senders ***

CRC conducted studies of current river usage and validated these studies through stakeholder outreach to determine what clearances are required by current river users. These efforts included a Boat Survey to identify the types of vessels that use the Columbia River at the project location, their frequency of usage and required navigation clearance. Additionally, a series of telephone and/or face-to-face interviews were conducted with river users to validate and update the information contained in the Boat Survey. Along with these efforts, the United States Coast Guard (USCG) held a preliminary hearing on the Columbia River Crossing to solicit comments from river users.

The information gathered from the above mentioned studies and stakeholder outreach was considered in conjunction with the operational statutes for nearby Pearson Field and with requirements for safe and efficient operation of the proposed highway, light rail, and multi-use path facilities. Taking all of these considerations into account, it was determined that a 95-foot vertical clearance will allow all but a couple of infrequent river users to navigate beneath the bridge at all times of year. These infrequent river users include marine contractors and a few sailboats. However, it is possible for contractors to partially disassemble equipment so they could pass beneath a 95-foot vertical clearance.

The protection of Pearson Field, although important from the perspective of historic resource protection, the local economy, the provision of public services, and preferences stated by the City of Vancouver, is not the only factor influencing bridge heights over the Columbia River. Possible intrusions into Portland International Airport airspace, maintenance of marine navigation, construction staging, maintaining I-5 traffic, and constraints imposed by the location and alignment of the river crossing all constrain the ultimate design of the bridge.

Since the publication of the DEIS, the Urban Design Advisory Group (UDAG) met multiple times to discuss the design of the bridges and

Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

CRC are seeking non-compliance waves when other project stay in-compliance

P-078-006

The reasons that CRC staff continues to tell committees, citizens, and elected official including members of Congress that the Third Bridge was studied, are ….It was brought in during NEPA Scoping and CRC documents state all reasonable alternative brought in during scoping must be thoroughly studied this is one of the reasons opponents state the NEPA process has not been followed, and a Supplemental Environmental Impact Statement must be started immediately. AND the CRC is seeking wavers from Federal Agencies for non-compliance on issue of Marine Navigation, Aviation, and Historic 4(f) problems that require looking for alternative that stay in compliance.

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Sharon Nasset

ultimately endorsed the two-bridge concept in January 2009 and also endorsed the open-web concept in September of 2009. The Project Sponsors Council endorsed a two-bridge option in June of 2009, and also endorsed the Pedestrian and Bicycle Advisory Committee recommendations for a covered pathway with the conditions of the maintenance and security plan in September of 2009. Then in February 2011, the CRC Bridge Review Panel recommended that the project discontinue work on the open-web concept and instead select either a composite deck truss, tied arch or cable-stayed bridge type. Following additional analysis and outreach, the governors announced the selection of the composite deck truss as the preferred bridge type in April 2011.

For a more detailed description of the limitations and opportunities that influenced the bridge type selection process, please see Technical Screening Study Final Report December 2008, Aesthetic Screening Study Final Report March 2009, Final Type Study Report October 2009, CRC Project Bridge Review Panel Report, February 2011, CRC: Key Findings and Recommendation Related to Bridge Type, February 2011 and the memo from the governors offices – Moving Forward; CRC Background, Bridge-type Major Factors, Next Steps, April 2011. Much of this information is also summarized in Chapter 2 of the FEIS.

P-078-004

The vision and values of the CRC are used to help guide how the CRC address the Purpose and Need (found in Section 1.5 of the FEIS). The values related to property acquisitions include:

- Supporting a healthy and vibrant land use mix of residential, commercial, industrial, recreational, cultural, and historic areas.
- Recognizing the history of the community surrounding the I-5 BIA, supporting improved community cohesion, and avoiding neighborhood disruption.
- Ensuring the fair distribution of benefits and adverse effects of the project for the region, communities, and neighborhoods adjacent to

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the project area.

Since the publication of the DEIS in May of 2008, and the selection of the LPA by project partners in July 2008, the CRC project team has been working to minimize the potential property impacts associated with the project's improvements. Though the project team has been working to stay within the existing right-of-way, some property right acquisitions will be unavoidable. Property owners will receive just compensation for the estimated value of land and improvements acquired and for other impacts that result in a measurable loss of value to the remaining property. Following the publication of the FEIS, property owners will be notified of impacts to their property and acquisition negotiations will begin. The acquisition and relocation process will follow The Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970 (as amended).

Alignments associated with a new river crossing were analyzed and dismissed in the screening process, as described in Section 2.7 of the FEIS.

The CRC project team has worked with RTC and project partners throughout the NEPA process.

P-078-005
Please see the response to Ms. Nasset's other FEIS comment letters, P-075 to P-083.

P-078-006
This is a repeat of comments P-078-001 through P-078-005, to which responses have been provided.

Hines, Maurice

From: Sharonnasset [sharonnasset@aol.com]
Sent: Monday, October 24, 2011 10:31 PM
To: Columbia River Crossing
Subject: formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project. -5
Attachments: CRC_Questions_Letter-March-2011.pdf; Budget_note_ODOT.pdf; Benton_and_Congressman(3).pdf; Note, HJM-22 benton -5.doc

P-079-001

Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

March 28, 2011 JMH-22 a "ceremonial letter" in support for the CRC's Locally Preferred Alternative from the Oregon Legislators was in committee. The CRC did not receive a letter of support out of committee.
Instead of a "ceremonial letter" of support a "note" of requirements for the project was attached at the Ways and Means Committee.

Twenty Members of the Oregon House of Representatives, Democratic and Republican have signed a letter to the House Committee on Transportation and Economic Development "We believe that there are important unresolved questions that demand further scrutiny" I have attached the entire letter. The Oregon House Members stated two concerns of several.

1. Attached a letter of 22 elected officials in who do not want a letter of support

2. Oregon Legislators Representatives and Senate have attached a Note to ODOT budget because of great concern with the CRC process and project.

3. The list of concerns on the ODOT budge include Alternatives, because reasonable alternatives were removed without being studied.

4. Senator Benton and twelve elected officials sent a letter to the Governors' that a range of alternative have not been studied if "port to port" connection (Third Bridge Now) is not studied. They ask for a Supplemental Environmental Impact Statement to be started immediately because a range of alternatives was not studied.

Sharon Nasset
CEO Third Bridge Now

1

P-079-001

Input by citizens, elected officials and other stakeholder on whether or not a Supplemental DEIS should be completed or more NEPA-related studies should be conducted is appreciated. However, it is the responsibility and authority of the federal NEPA lead agencies to determine when a Supplemental EIS or other environmental study is required. See Section 2.7.9 and Appendix O of the FEIS for a discussion of how FTA and FHWA reviewed changes and made determinations regarding supplemental documentation.

The CRC project has supporters and opponents, and has remaining issues to resolve as noted in Ms. Nasset's letter and attachments. Many of the funding questions raised in the attachments have been responded to in the project's updated finance plan (Chapter 4 in the FEIS) while other issues regarding funding remain to be resolved. The key consideration for the FEIS and ROD is that there has been adequate analysis, involvement, documentation and disclosure to allow the completion of the NEPA process. Remaining non-NEPA issues will be addressed during final design.

Please see the response to Ms. Nasset's other FEIS comment letters, including letter P-077, which explains why additional study is not required on the port to port alternative or other similar alternatives.

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Washington State Senate

109B Irv Newhouse Building
P.O. Box 40417
Olympia, WA 98504-0417

Senator Don Benton
17th Legislative District

Olympia Ph: (360) 786-7632
District Ph: (360) 576-6059
E-mail: benton.don@leg.wa.gov

February 11, 2009

Dear Governors' Christine Gregoire and Ted Kulongoski, Sponsor Agencies; Southwest Washington Regional Transportation Council and CTRAN,

P-079-001

Attached please find correspondence from Congressman Earl Blumenauer to the Director of the Oregon Department of Transportation, dated January 7, 2009

We would like to thank Congressman Earl Blumenauer for his leadership on the Columbia River Crossing project's need to follow the National Environmental Policy Act (NEPA) requirements, that all alternatives are thoroughly studied. A thorough study of all options to include data is a necessary requirement in the NEPA process. This valuable step in the NEPA process brings the best options to the forefront and creates cooperation between the sponsoring agencies, stakeholders, and taxpayers, and the ability to receive Federal funding for the project.

We are asking that the CRC project immediately commence a Supplemental EIS to fully study the "port-to-port connector" option RC-14.

The foci of the Columbia River Crossing are the economy, safety, and the environment. A thorough NEPA process will create comparable data that will answer questions of cost, land use, environmental justice, mobility, congestion relief, regional freight, the distribution of benefits, and impacts.

In summary, adherence to the National Environmental Policy Act is essential for promoting consensus among various stakeholders and for demonstrating transparency. The I-5 international highway system's importance is internationally known. An open and transparent process is needed to build stakeholders consensus that will propel and help develop this project to completion. A project as important and enormous as the Columbia River Crossing must have transparency and must provide credible comparable data on the "port to port connector."

Financial Institutions, Housing & Insurance, Ranking Member • Government Operations & Elections • Transportation

P-079-001

We the undersigned, as elected officials, and with our constituents' best interests at the forefront of our actions, urge Southwest Regional Transportation Council, CTRAN and the Governors of Oregon and Washington, to direct CRC Project to proceed with a full Supplemental EIS on the "port to port connector" RC-14, starting in March 2009.

Thank you for your immediate attention to this very urgent matter.

Respectfully submitted,

Senator Don Benton
17th District
Member of the
Senator's Joint CRC Oversight Committee

Senator Pam Roach
WA State Senator 31st District

Councilor Pat Campbell
Vancouver City Councilmen #6

Senator Bob Morton
WA State Senator 7th District
Environment, Water & Energy Committee

Commissioner Marc Boldt
Clark County Commissioner
SW WA Regional Transportation Council

Commissioner Jerry Oliver
Port of Vancouver

Commissioner Tom Mielke
Clark County Commissioner
SW WA Regional Transportation Council
CTRAN Board Member

Senator Jim Honeyford
WA State Senator 15th District
Environment, Water & Energy Committee
Ways and Means Committee

Senator Bob Mc Caslin
WA State Senator 4th District
Economic Development Trade and Innovation

P-079-001 In support of Senator Benton's letter to Governors Christine Gregoire and Ted Kulongoski, Sponsor Agencies; Southwest Washington Regional Transportation Council and CTRAN.

Representative Bruce Chandler
WA State Representative 15th District
Commerce and Labor Committee
Ways and Means Committee

Senator Larry George
OR State Senator 13th District
Senator's Joint CRC Oversight Committee

EARL BLUMENAUER
THIRD DISTRICT, OREGON

COMMITTEE ON WAYS AND MEANS
SUBCOMMITTEES:
TRADE
SELECT REVENUE MEASURES

COMMITTEE ON BUDGET

Congress of the United States
House of Representatives
Washington, DC 20515-3703

WASHINGTON OFFICE
2267 RAYBURN BUILDING
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(202) 225-4811
FAX: (202) 225-8941

DISTRICT OFFICE
729 N.E. OREGON STREET
SUITE 115
PORTLAND, OR 97232
(503) 231-2300
FAX: (503) 230-5413

WEBSITE: blumenauer.house.gov

January 7, 2009

Matthew Garrett, Director
Oregon Department of Transportation
355 Capitol Street NE Rm 135
Salem, OR 97301

Dear Director Garrett:

P-079-001

Attached please find correspondence from my constituent, Ms. Sharon Nasset regarding the process for the proposed Columbia River Crossing project. Ms. Nasset is concerned that one option—known as the "port-to-port connector"—was removed from consideration without being subject to a complete NEPA analysis, and leaves the project vulnerable to legal challenges that may result in crippling delays.

Ms. Nasset believes that the CRC project should immediately commence with a supplemental EIS to fully study the "port-to-port connector" option.

As ODOT is one of the agencies leading the efforts on this project, I'm sharing her concerns with you. I would appreciate a response from ODOT or the CRC project addressing how the "port-to-port connector" option was removed from consideration as it relates to the NEPA process.

Thank you for your time and consideration.

Sincerely,

Earl Blumenauer

Earl Blumenauer
Member of Congress

Cc: Sharon Nasset

PRINTED ON RECYCLED PAPER

Dear Congressman Earl Blumenauer,

P-079-001

Thank you for this opportunity to bring our concerns to you. It also has been recommended by locally elected officials that federal elected officials take the lead on this because NEPA is a requirement for federal funding and the NEPA process has not been followed. The National Environmental Policy Act was established to guarantee everyone would have a valued part in construction projects within our United States. It is our understanding that all parties should have an equal part in the decision making of a project. We also understand that all data and information used in the decision making process is to be publicly transparent and available. The NEPA process was established to avoid problems with the few with power subjecting their will over the citizens. The hard work that made justice part of the public works project process will only be followed when our elected officials insist the NEPA process be followed. Therefore, I come before you today asking you to use the power the citizens have given you to work on their behalf to impose justice and insure we, are a land ruled by law.

We see two possible outcomes the way this project is being managed:

1. Connect with CRC and have them follow the NEPA laws or
2. Wait until the Environmental Impact Statement is complete and then deal with Law suits.

If we wait we could face the issues that the "Bridge to Nowhere "faced. Our credibility at the Federal level will be lost and we will have to start over.

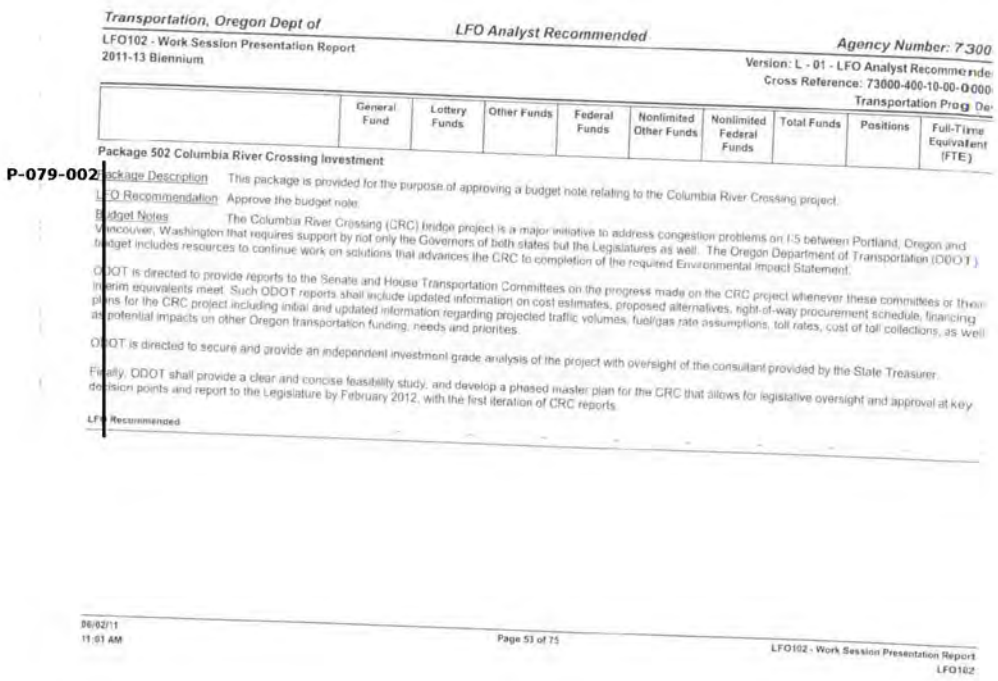
We are providing a list of those on record who have stated that the Replacement Bridge is the wrong project, the NEPA process has not been followed, Open Meetings Laws have been violated and the process needs to be opened to options that were arbitrarily remove by CRC:
Clark County Commissioners, Bike Transportation Alliance, Coalition for a Livable Future, Oregonians In Action, 1000 Friends of Oregon, Cascade Policy Institute, Evergreen Freedom Foundation, Board of Sustainable Future, Osprey, Audubon Society, EPA, Lars Larson, Onward Oregon, Sensible Transportation Solutions, Economic Transportation Alliance, Local Economists, Environmentalist, Metro Councilors, Port Vancouver Commissioner Jerry Oliver, Senator Benton, Representative Jim Dunn, Representative Chip Shields, Senator Larry George, Senator Gary George, Pearson Airport board members, US Fish & Wildlife hatchery division, Clark College Law Department, Professor Will Macht, CRC Sponsor Agencies and 800 taxpayer signatures. This group of tax payers rarely has the opportunity to speak with one voice.

In conclusion we are asking you to require the Columbia River Crossing Project to immediately perform a Supplemental Environmental Impact Study to thoroughly study the Port-to-Port connection RC-14.

Sincerely,

Sharon Nasset

Economic Transportation Alliance



Transportation, Oregon Dept of — LFO Analyst Recommended — Agency Number: 7300

LFO102 - Work Session Presentation Report
2011-13 Biennium

Version: L - 01 - LFO Analyst Recommende
Cross Reference: 73000-400-10-00-0000
Transportation Prog De

	General Fund	Lottery Funds	Other Funds	Federal Funds	Nonlimited Other Funds	Nonlimited Federal Funds	Total Funds	Positions	Full-Time Equivalent (FTE)

Package 502 Columbia River Crossing Investment

P-079-002

Package Description: This package is provided for the purpose of approving a budget note relating to the Columbia River Crossing project.

LFO Recommendation: Approve the budget note.

Budget Notes: The Columbia River Crossing (CRC) bridge project is a major initiative to address congestion problems on I-5 between Portland, Oregon and Vancouver, Washington that requires support by not only the Governors of both states but the Legislatures as well. The Oregon Department of Transportation (ODOT) budget includes resources to continue work on solutions that advances the CRC to completion of the required Environmental Impact Statement.

ODOT is directed to provide reports to the Senate and House Transportation Committees on the progress made on the CRC project whenever these committees or their interim equivalents meet. Such ODOT reports shall include updated information on cost estimates, proposed alternatives, right-of-way procurement schedule, financing plans for the CRC project including initial and updated information regarding projected traffic volumes, fuel/gas rate assumptions, toll rates, cost of toll collections, as well as potential impacts on other Oregon transportation funding, needs and priorities.

ODOT is directed to secure and provide an independent investment grade analysis of the project with oversight of the consultant provided by the State Treasurer.

Finally, ODOT shall provide a clear and concise feasibility study, and develop a phased master plan for the CRC that allows for legislative oversight and approval at key decision points and report to the Legislature by February 2012, with the first iteration of CRC reports.

LFO Recommended

06/02/11
11:01 AM

Page 53 of 75

LFO102 - Work Session Presentation Report
LFO102

P-079-002

Please see response to comment P-079-001 above.

HOUSE OF REPRESENTATIVES
900 COURT ST NE
SALEM, OR 97301

MEMORANDUM

TO: House Committee on Transportation and Economic Development

FROM:

Rep. Jules Bailey	Rep. Chris Garrett
Rep. Phil Barnhart	Rep. Mitch Greenlick
Rep. Katie Eyre Brewer	Rep. Chris Harker
Rep. Ben Cannon	Rep. Mark Johnson
Rep. Brian Clem	Rep. Shawn Lindsay
Rep. Jason Conger	Rep. Mike McLane
Rep. Michael Dembrow	Rep. Mary Nolan
Rep. Margaret Doherty	Rep. Julie Parrish
Rep. Lew Frederick	Rep. Patrick Sheehan
Rep. Tim Freeman	Rep. Carolyn Tomei

DATE: March 28, 2011

RE: CRC Questions

P-079-002

Thank you for scheduling this important hearing on HJM 22. Having reviewed recent correspondence regarding the Columbia River Crossing[1], we believe that there are important unresolved questions that demand further scrutiny before the commitment of additional public dollars to this project.

Raising questions should not be construed as opposition to a new bridge. We are well acquainted with the congestion issues in the I-5 corridor; we recognize the need for major improvements at the Columbia River; and we fully support the effort to secure federal funds. These arguments in favor of a major project, however, are not necessarily arguments for any specific proposal. With respect to the current CRC proposal, at least the following questions deserve further attention.

1. What is the "true cost" of the CRC?

P-079-003

The cost of the CRC is represented to be between $3.2 and $3.6 billion. Impresa argues that the true cost, in year-of-expenditure dollars, is closer to $10 billion over the life of the project after accounting for debt service and the need for improvements to the Rose

[1] We refer to the Oct. 4, 2010 memo from Impresa Consulting; the Jan. 21, 2011 response from ODOT; and the Feb. 7, 2011 reply from Impresa Consulting.

P-079-003

The Oregon Department of Transportation (ODOT) completed Phase I construction of the I-5 Delta Park widening project in fall 2010. Phase I of the project involved widening I-5 and lengthening the entrance and exit ramps at Victory Boulevard and Columbia Boulevard. Phase II involves improving local streets and will begin when funding is secured. Phase I of the Delta Park project widened the current 2-lane segment of southbound I-5 to 3 lanes. There are currently no immediate plans to widen I-5 south of Delta Park. Neither the CRC project nor the Delta Park projects are intended to address the southbound traffic congestion that currently exists near the I-5/I-405 split. However, traffic analyses show the congestion at the split will not be worsened because of the Columbia River Crossing project. The main reason is that fewer cars are expected to cross the river with a project in 2030 than without a project. This is due to the provision of improved transit service and tolling.

Beyond the CRC and Delta Park projects, the I-5 Transportation and Trade Partnership Final Strategic Plan recommended a comprehensive list of modal actions relating to: additional transit capacity and service; additional rail capacity; land use and land use accord; transportation demand/system management; environmental justice; additional elements and strategies (such as new river crossings); and financing. RTC and Metro are tasked with initiating recommendations as part of their regional transportation planning role. Examples of current efforts include RTC's evaluation of future high-capacity transit in Clark County, and evaluation of needs for future river crossings. Regional planners have investigated solutions to existing bottlenecks at the I-5 connections with I-405 and I-84. ODOT is responsible for conducting ongoing studies to identify other congestion problems on I-5 in Oregon that may need to be addressed in the future.

P-079-003

Quarter. CRC responds that the Rose Quarter is a "different" issue. But it appears to be very much in question whether the CRC, absent Rose Quarter improvements, accomplishes much more than shifting the I-5 bottleneck to the south. If Rose Quarter improvements are an essential part of a complete solution to I-5 congestion in the Portland area, then those expenses should be considered in evaluating the true cost, and in presenting the cost to the public.

2. Traffic projections and tolling revenue

P-079-004

The CRC financing plan depends heavily on tolling revenue. The projected revenue from tolling depends, in turn, on projected traffic over the new bridge. The Impresa analysis contends that based on ODOT's own data and assumptions of 1% annual growth, traffic over the CRC will be 30,000 vehicles per day **lower** in 2030 than the DEIS forecast. If this is correct, the less-than-projected tolling revenue results (according to Impresa's analysis) in a debt service **shortfall of $1 billion**.

In the few years since CRC's projections were issued, traffic over the bridge has not only failed to increase as forecast, it has actually declined. Based on the exchange between Impresa and ODOT, there appears to be an empirical dispute about whether the current decline in traffic levels merely reflects the recession or, instead, reflects a longer term "sea change" in how people commute. Impresa points out that the decline in traffic preceded the recession by two full years. We are not aware of a refutation of this point.

CRC/ODOT assert that their projections are based on commonly accepted models; Impresa responds that these models are themselves flawed, and cites examples. We are not aware of a refutation of this point, either.

Finally, ODOT says that there will be an independent, investment-grade study at a future time, before bonding. **If there is an undisputed need for an independent, investment-grade financial analysis,** it should be undertaken before any major commitment of additional public dollars.

3. Cost overruns

P-079-005

Critics assert that CRC's cost estimate of $3.2-3.6 billion is low by at least hundreds of millions of dollars, given the likelihood of cost overruns in a project such as this.

Cost overruns are a fact of life and should not be taken by themselves as a reason to oppose the project. However, the magnitude of possible overruns should be considered in conjunction with the significant questions about the CRC's traffic and tolling projections. If we are materially off-target on *both* projected costs and projected revenues, this could create enormous downside exposure for Oregon taxpayers. We are not satisfied that this downside risk has been fully digested.

Thank you for your consideration of these issues.

P-079-004

At Governor Kitzhaber's request, the Oregon State Treasurer conducted an independent review of the CRC's financing plan and released a report in July 2011. CRC incorporated the treasurer's recommendation in Chapter 4 of the Final EIS. The Investment Grade Tolling Analysis will follow, and must follow, the Record of Decision.

P-079-005

Past financial performance is an important issue but is not relevant to the NEPA review process. The Record of Decision concludes the NEPA analysis. It indicates which alternative has been selected by the federal government, and allows for the continued design, eligibility for federal funding and permitting, and eventual construction of that alternative. The Locally Preferred Alternative is supported by local, regional, state, and federal agencies and has been selected following an exhaustive analysis and public involvement program.

The project takes the issues of financial management very seriously. Project staff have provided Ms. Nasset with considerable records and reports and has responded to her inquiries. The project is currently developing new financial reporting mechanisms and has started providing monthly reports on the internet. The project will continue to work with the public to improve transparency and an understanding of the resources required for an undertaking of this scale.

Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

P-079-006

March 28, 2011 JMH-22 a "ceremonial letter" in support for the CRC's Locally Preferred Alternative from the Oregon Legislators was in committee. The CRC did not receive a letter of support out of committee.
Instead of a "ceremonial letter" of support a "note" of requirements for the project was attached at the Ways and Means Committee.

Twenty Members of the Oregon House of Representatives, Democratic and Republican have signed a letter to the House Committee on Transportation and Economic Development **"We believe that there are important unresolved questions that demand further scrutiny"** I have attached the entire letter. The Oregon House Members stated two concerns of several.

1. Attached a letter of 22 elected officials in who do not want a letter of support
2. Oregon Legislators Representatives and Senate have attached a Note to ODOT budget because of great concern with the CRC process and project.
3. The list of concerns on the ODOT budge include Alternatives, because reasonable alternatives were removed without being studied.
4. Senator Benton and twelve elected officials sent a letter to the Governors' that a range of alternative have not been studied if "port to port" connection (Third Bridge Now) is not studied. They ask for a Supplemental Environmental Impact Statement to be started immediately because a range of alternatives was not studied.

Sharon Nasset
CEO Third Bridge Now
503.283.9585
Sharonnasset@aol.com

P-079-006

These comments repeat the comments provided on page 1 of Ms. Nasset's submittal, responses are provided above.

The Columbia River Crossing Does Not Qualify for Federal Funding

For the following reasons:

P-080-001
1. A range of highway and transit alternatives thoroughly studied though construction. With cost, benefit, and impacts identified has not taken place

2. Reasonable alternatives accepted into the NEPA Scoping process were removed without consideration or study.

3. 4(f) Historic Resource avoidance if it is prudent or feasible to construct in a different place. It is both prudent and feasible to construct the Third Bridge "port to port" connector. The Columbia River Crossing current "Locally Preferred Alternative" removes up to 20 Historical properties. The Third Bridge was removed from the process without being considered.

4. Purpose and Needs avoidance of impacts to I-5 freeway, residential, retail, and commercial area is not being followed. There are several less impacts with a Third Bridge Alignment avoidance of 4(f) Historic Resources, no construction congestion on I-5 Freeway, removes traffic from I-5, fewer impacts in downtown Vancouver, no removal of business and residences on Jantzen Beach, in Oregon it is mostly bare, vacant, and publicly own land.

P-080-002
5. No No-Build Alternative or Baseline applied to project. No-Build Alternative as required was not developed or studied. NO ACTION is different than a No-Build Alternative

P-080-003
6. Light rail does not go to the 5 key service area's. To service an area the location must be with in ½ mile of the High Capacity Transit stop. Only one area is serviced the central city. The central city location is not a destination it is a transfer for regional and other areas.

P-080-004
7. Navigational safety issues of marine and airspace are not constrained with the Third Bridge located 1 mile further west from the current bridges.

P-080-005
8. Cost and Benefit anlysis has not been complete on this project. Vacant land cost less than buying property, removing people, removing business, residents, and preparing the land for construction. Up to 7 years of construction on I-5 freeway will damage the national economy as well as the region and our two States. Putting money into infrastructure not into tearing down properties currently in use.

Thank you, kindly
Sharon Nasset Third Bridge Now . com

P-080-001

Please see Chapter 5 of the FEIS for the Section 4(f) Evaluation. The "Avoidance Alternatives" discussion starts on page 5-60. Also see the responses provided to Ms. Nasset's comments made on the DEIS, and the response to Ms. Nasset's FEIS comment letters P-077 and P-079.

P-080-002

A No-Build Alternative was studied in the DEIS and FEIS. See description of the No-Build Alternative in Section 2.4 of the FEIS, and analysis of impacts in Chapter 3.

P-080-003

The light rail alignment associated with the LPA was chosen by project partners to maximize ridership and to offer an alternate means of transportation to driving a vehicle in the I-5 corridor. It is expected that the CRC project will qualify for federal funding.

P-080-004

The Bi-State Industrial Corridor does not adequately meet the project's purpose and need. Also see responses to Ms. Nasset's other FEIS comment letters, including P-077.

P-080-005

The project has completed a benefit cost analysis. It can be reviewed at, or a copy obtained from, the project office.

Economic impacts, as well as the impacts and costs associated with property acquisition and relocation, are discussed in the FEIS.

Hines, Maurice

From: Sharonnasset [sharonnasset@aol.com]
Sent: Monday, October 24, 2011 10:57 PM
To: Columbia River Crossing
Subject: formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project. -7
Attachments: Disclaimer.-7doc.doc

P-081-001

Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

The CRC has used maps that are not guaranteed or warrant by the States of Oregon or Washington and it agents….. many of the maps are inaccurate and CRC staff has been informed that their maps are not accurate…… CRC staff has used these maps to send to the FTA and FHWA. Have CRC provide maps showing the I-5 Corridor and the I-5 Bridge Influence Area that are guaranteed . You will find that the the CRC can not use the dame maps because they made false statement with the earlier maps.

Sharon Nasset
CEO Third Bridge Now
503.283.9585
Sharonnasset@aol.com

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

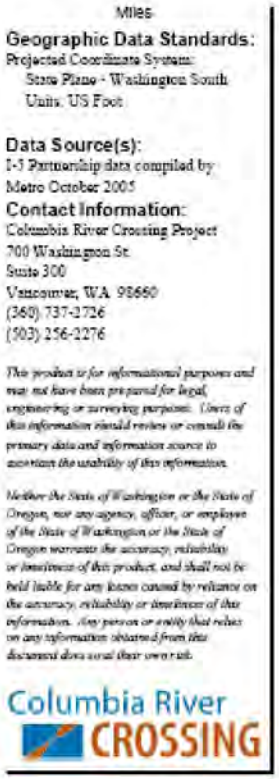
P-081-001

It is not clear what maps or errors Ms. Nasset is referring to in this comment, or how they may have affected any findings.

Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

P-081-001 The CRC has used maps that are not guaranteed or warrant by the States of Oregon or Washington and it agents,.... many of the maps are inaccurate and CRC staff has been informed that their maps are not accurate..... CRC staff has used these maps to send to the FTA and FHWA. Have CRC provide maps showing the I-5 Corridor and the I-5 Bridge Influence Area that are guaranteed . You will find that the the CRC can not use the dame maps because they made false statement with the earlier maps.

Sharon Nasset
CEO Third Bridge Now
503.283.9585
Sharonnasset@aol.com



Hines, Maurice

From: Sharonnasset [sharonnasset@aol.com]
Sent: Monday, October 24, 2011 11:20 PM
To: Columbia River Crossing
Subject: formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project. -9

P-082-001

Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

1. CRC staff made false statement in Screening A . The BNSF rail bridge is outside of the I-5 Corridor when it known as the heart of the I-5 Corridor.

2. CRC staff made false statements about the location of the I-5 Bridge Influence Area. After giving staff information the hide data.... Change maps and then started calling the area a new name.... Project area.

3. Maps and data have been handed in.... then CRC staff removed and falsify data.

Sharon Nasset
CEO Third Bridge Now
503.283.9585
Sharonnasset@aol.com

P-082-001

Please see the responses to Ms. Nasset's comments made on the DEIS (P-0781, P-0797, P-0936, P-0977, P-1058, and P-1168), which were published with the Final EIS.

Note that whether the BNSF rail bridge is labelled as being "outside" or "inside" the "I-5 corridor" is not the factor that determines its suitability as an alignment for a highway, rail, transit or bicycle and pedestrian crossing. The critical factor was the performance of a given crossing location, as determined through the alternatives evaluation process. Please see the response to Ms. Nasset's FEIS comment letter P-077.

Hines, Maurice

From: Sharonnasset [sharonnasset@aol.com]
Sent: Monday, October 24, 2011 11:51 PM
To: Columbia River Crossing
Subject: formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project. -10
Attachments: OpenHouseBoardsJan2007.pdf

P-083-001

Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

The Purpose and Need Statement and the Project Area map do not agree with each other….. the Purpose and Needs Statement say the "center of the project area is the two deep water ports a the transcontinental rail line."
The Project Area maps do not include the ports and the rail line! It make the I-5 freeway the center of the project area..!!

CRC staff continue to use the words I-5 Freeway and I-5 Corridor as the same…… the I-5 Corridor in our region has specific location boundaries. CRC uses the I-5 Freeway and I-5 Corridor to confuse people and to be dishonest.

See the attached project maps……

Sharon Nasset
CEO Third Bridge Now
503.283.9585
Sharonnasset@aol.com

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

P-083-001

Please see the responses to Ms. Nasset's comments made on the DEIS (P-0781, P-0797, P-0936, P-0977, P-1058, and P-1168), which were published with the Final EIS.

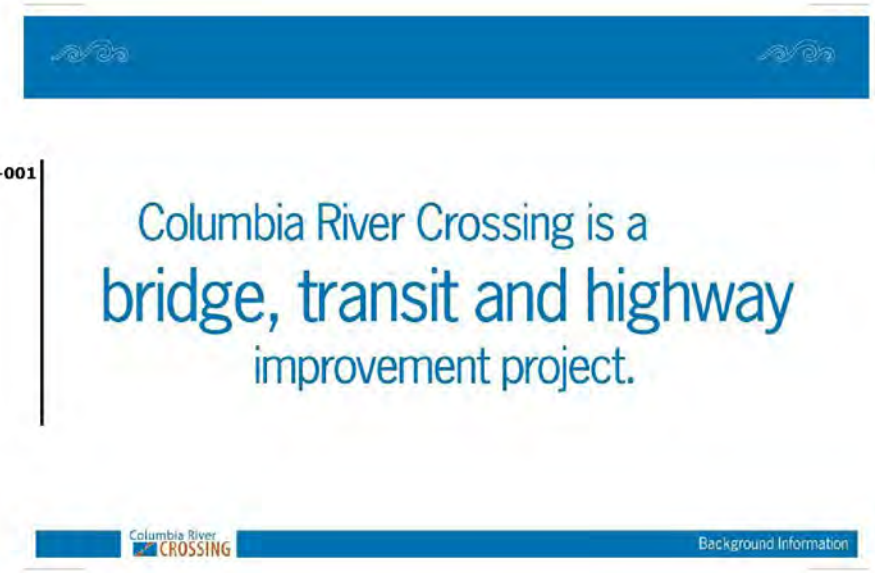
The purpose and need was written broadly enough to allow alternatives well outside the immediate I-5 alignment to be considered and evaluated. However, the early screening process demonstrated that building a new crossing in a new corridor, in lieu of improving the existing I-5 crossing, would fail to meet basic elements of the project's purpose and need. This narrowing of alternatives meant that the DEIS alternatives could be shown on maps with a more focused geographic scope than could the broad range of potential alternatives that were considered in early screening.

Please also see the responses to Ms. Nasset's other FEIS comment letters, P-075 to P-082.

P-083-001


Project Area
N
Vancouver
Portland
Washington
Oregon
Columbia Blvd.
Columbia River CROSSING
Background Information

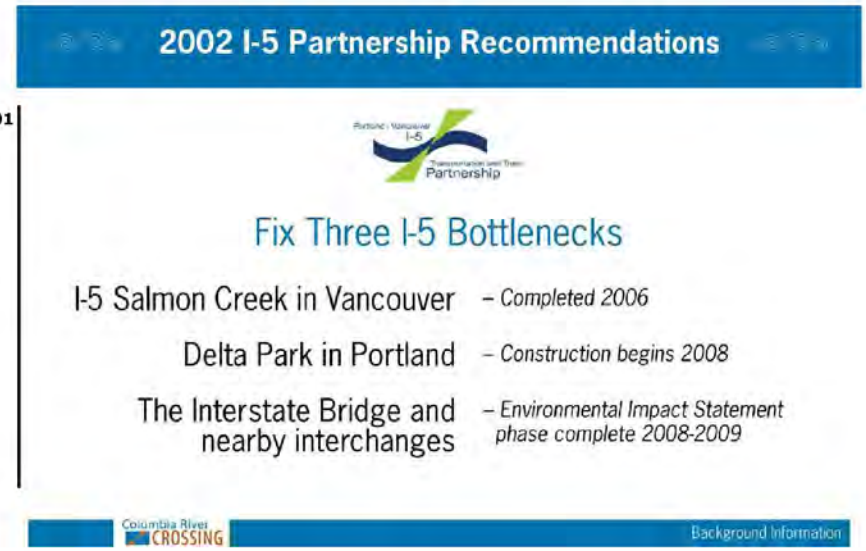
P-083-001


Columbia River Crossing is a
bridge, transit and highway
improvement project.
Columbia River CROSSING
Background Information

P-083-001


Leading the Project and
Other Project Partners
Oregon Department of Transportation
Washington State Department of Transportation
City of Vancouver
City of Portland
Metro
Regional Transportation Council
C-TRAN
TriMet
Columbia River CROSSING
Background Information

P-083-001


2002 I-5 Partnership Recommendations
Partnership
Fix Three I-5 Bottlenecks
I-5 Salmon Creek in Vancouver – Completed 2006
Delta Park in Portland – Construction begins 2008
The Interstate Bridge and nearby interchanges – Environmental Impact Statement phase complete 2008-2009
Columbia River CROSSING
Background Information

P-083-001

What are the Problems?



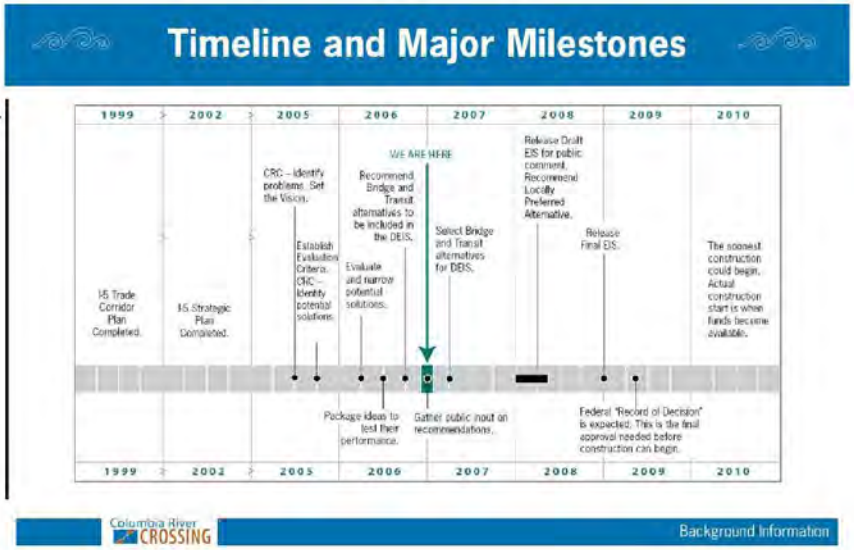


- This segment of I-5 currently suffers four to six hours of congestion a day
- If no improvements are made, congestion will increase to 16 hours a day by the year 2030
- Transit and freight get bogged down in this same congestion
- Short on and off ramps contribute to a high accident rate
- Poor sight distance approaching and on the bridge contributes to rear-end crashes
- During bridge lifts, crash rates increase three to four times
- The bike and pedestrian path is narrow, indirect and hard to find
- The bridge does not meet current earthquake standards

P-083-001


Timeline and Major Milestones
Congestion
Transit
Highway
Freight
Efficiency
Pedestrian
Bicycle
River Crossing
1 Identify problems • Set the Vision • Establish Evaluation Criteria
2 Identify range of potential solutions
3 Screen ideas based on evaluation criteria • Narrow solutions
4 Combine ideas into packages • Test their performance
We Are Here
5 Select alternatives to be analyzed in the Draft Environmental Impact Statement
6 Release Draft EIS for public comment • Identify Locally Preferred Alternative
Begin Construction
7 Complete Final EIS • Secure Federal Approval
Columbia River CROSSING
Background Information

P-083-001


Timeline and Major Milestones
1999
2002
2005
2006
2007
2008
2009
2010
I5 Trade Corridor Plan Completed.
I5 Strategic Plan Completed.
CRC – identify problems. Set the Vision.
Establish Evaluation Criteria. CRC – identify potential solutions.
Evaluate and narrow potential solutions.
Recommend Bridge and Transit alternatives to be included in the DEIS.
WE ARE HERE
Select Bridge and Transit alternatives for DEIS.
Release Draft EIS for public comment. Recommend Locally Preferred Alternative.
Release Final EIS.
The soonest construction could begin. Actual construction start is when funds become available.
Package ideas to test their performance.
Gather public input on recommendations.
Federal "Record of Decision" is expected. This is the final approval needed before construction can begin.
Columbia River CROSSING
Background Information

P-083-001


Evaluating Options and Making Progress
Initial Screening
River Crossing Options
Transit Options
Narrowed to
We Are Here
Preliminary Alternatives
River Crossing Options
Transit Options
*Above options were combined into 12 packages for testing.
Narrowed to
Staff Recommendations
River Crossing Options
Replacement Bridge: Downstream/Mid-level
Replacement Bridge: Upstream/Mid level
Transit Options
Bus Rapid Transit (BRT) with Express Bus service
Light Rail Transit (LRT) with Express Bus service
Other Issues to Address in Draft Environmental Impact Statement
Bus Rapid Transit/Light Rail Transit alignments and station locations
Freight improvements
Transportation System efficiencies
Bicycle / pedestrian improvements
Air quality, noise reduction
Environmental effects
Cultural and historical resource protection
Managed lanes
Tolling
Bridge type, appearance, and alignment (upstream or downstream)
Columbia River CROSSING
Background Information

P-083-001

The Interstate Bridge Facts

The Interstate Bridge is actually two bridges.

Northbound
Built in 1917, listed on National Register of Historic Places
Southbound
Built in 1958 to match the first bridge

Both bridges were financed with tolls
1917 – 5 cents. The bridge was paid off and tolls removed in 1929.
1958 – 20 to 60 cents (roughly = $2.60 today), depending on the vehicle type. The bridge was paid off and tolls removed in 1966.



Columbia River CROSSING
Background Information

P-083-001

We Are At an Important Decision Point



The ideas that advance will be analyzed in detail in the Draft Environmental Impact Statement.

Columbia River CROSSING

Key Decision Point

P-083-001

We Recommend These River Crossing and Transit Ideas



Advance these ideas for detailed analysis in the Draft Environmental Impact Statement

River Crossing

- Replace the existing bridges with a new I-5 bridge to carry highway traffic, transit, bicycles and pedestrians.

Transit

- Bus Rapid Transit with express bus service
- Light Rail Transit with express bus service

Columbia River CROSSING

Key Decision Point

P-083-001

Bridge Recommendation



Replace the Interstate Bridge with a new structure

High enough to avoid bridge lifts

Low enough to avoid Pearson Airpark airspace

Either immediately downstream or upstream of current I-5 Bridge

Columbia River CROSSING

Key Decision Point

P-083-001


Why Do We Need a New I-5 Bridge?
More Predictable Travel Times
for People, Transit, Goods
Columbia River CROSSING
Key Decision Point

P-083-001

Why Do We Need a New Bridge?



Improves Safety and Capacity

Adds lanes for safe traffic operations and improved travel times

Fixes short on and off ramps along I-5

Improves sight distance

Adds safety shoulders

Provides wider lanes and better connections for bicyclists and pedestrians

Reduces river navigation obstacles for boats and tugs

P-083-001

Why Remove the Existing Bridge?

Fewer Impacts

One bridge creates a smaller footprint on land and water than two

Stormwater run-off will be collected and treated, meaning cleaner water

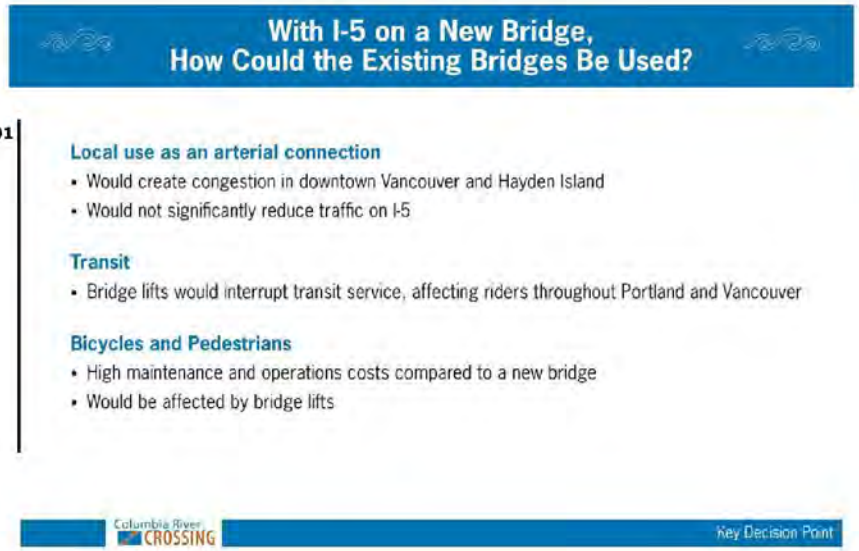
Fewer bridge piers have less impact on fish habitat

Less cut-through traffic through downtown Vancouver and Hayden Island



Columbia River CROSSING

Key Decision Point


With I-5 on a New Bridge,
How Could the Existing Bridges Be Used?
P-083-001
Local use as an arterial connection
• Would create congestion in downtown Vancouver and Hayden Island
• Would not significantly reduce traffic on I-5
Transit
• Bridge lifts would interrupt transit service, affecting riders throughout Portland and Vancouver
Bicycles and Pedestrians
• High maintenance and operations costs compared to a new bridge
• Would be affected by bridge lifts
Columbia River CROSSING
Key Decision Point

P-083-001

Why Remove the Existing Bridge?

Lower Operations and Maintenance Costs

It is expensive to operate and maintain the bridge lifts



Columbia River CROSSING

Key Decision Point

P-083-001

River Crossing – What's Out?

We evaluated the following ideas. They did not perform well enough to advance for further study.

- Movable lift span
- Tunnel to replace or supplement I-5
- High-level bridges
- New corridor crossing
- New corridor crossing plus widening existing I-5 bridges
- New western highway (I-605)
- New eastern crossing
- 33rd Avenue crossing
- I-205 improvements
- Arterial crossing without I-5 improvements
- Supplemental Bridge – Upstream – Midlevel
- Non-freeway multimodal crossing
- Double deck crossing



Columbia River CROSSING

Key Decision Point

P-083-001

Transit Recommendations



Bus Rapid Transit



Light Rail Transit

Bus Rapid Transit with express bus service
Light Rail Transit with express bus service

Both Bus Rapid Transit and Light Rail Transit are recommended because they:

- Have potential to reduce congestion on I-5
- Have the best potential to meet forecasted transit demand for the year 2030
- Address transit issues identifed in project's Purpose and Need Statement

Express bus service would provide direct access between suburban Clark County and downtown Portland during peak commute hours.

Columbia River CROSSING

Key Decision Point

P-083-001

Transit



Bus Rapid Transit



Light Rail Transit

CRC recommends advancing Bus Rapid Transit and Light Rail Transit

Potential to meet a growing population's travel demands

Provide reliable travel time

Increase transit use

Provide improved access to employment and commercial centers

Support local and regional transportation and land use plans

Columbia River CROSSING

Key Decision Point

P-083-001

What is Bus Rapid Transit?

Specially designated buses that can:

Use designated transit stations or platforms

Operate in a lane separate from regular traffic in some areas

Have the flexibility to travel on regular roads

Provide high passenger capacity

Operate as quiet, low emission vehicles

Provide fast, frequent and reliable all day service



Columbia River CROSSING

Key Decision Point

P-083-001

What is Light Rail Transit?

Rail-based vehicles that can:

Use designated transit stations or platforms
Operate in its own dedicated guideway
Provide high passenger capacity
Operate as quiet, low emission vehicles
Provide fast, frequent and reliable all day service



Columbia River CROSSING

Key Decision Point

P-083-001


Alternatives for
Draft Environmental Impact Statement
Bridge and Transit Recommendations will be combined with other project elements (interchanges, freight, bicycle and pedestrian and other improvements, as well as demand management) to form project alternatives.
• No action. This alternative is required for any Draft Environmental Impact Statement (DEIS) process as a baseline for comparison with other alternatives.
• Replacement Bridge and Bus Rapid Transit with Express Bus service.
• Replacement Bridge and Light Rail Transit with Express Bus service.
Columbia River CROSSING
Key Decision Point

P-083-001


What is a Draft Environmental Impact Statement?
A Draft Environmental Impact Statement is a summary of the expected impacts each project design, or "alternative," is likely to have on the surrounding area. This process:
• Is required of all federally funded projects
• Considers all benefits and impacts on the surrounding area of proposed project alternatives
• Analyzes a range of reasonable project designs, or "alternatives"
• Provides an intense and thorough process of analysis for each proposed alternative
• Shows compliance with environmental regulations
The National Environmental Policy Act (NEPA) is a federal law that regulates the decision-making processes of federally funded projects. The purpose of NEPA is to help ensure that public projects address the needs of the community while avoiding, minimizing or mitigating for negative impacts on human and natural environments.
For more information: http://www.environment.fhwa.dot.gov/projdev/index.asp
Columbia River CROSSING
Key Decision Point

P-083-001

Transit – What's Out?

These ideas did not perform well enough in the evaluation to advance for further study.

- Streetcar
- High-speed Rail
- Ferry Service
- Monorail System
- Magnetic Levitation Railway
- Commuter Rail in BNSF Trackage
- Heavy Rail
- Personal Rapid Transit
- People Mover / Automated Guideway Transit (AGT)


High-Speed Rail


Ferry Service


Magnetic Levitation Railway


People Mover/ Automated Guideway Transit

Columbia River CROSSING

Key Decision Point

P-083-001


Evaluation Criteria
The recommended River Crossing and Transit options performed better on nearly all of the evaluation criteria adopted by the CRC Task Force:
1. Community Livability and Human Resources
2. Mobility, Reliability, Accessibility, Congestion Reduction, and Efficiency
3. Modal Choice
4. Safety
5. Regional Economy / Freight Mobility
6. Stewardship of Natural Resources
7. Distribution of Benefits and Impacts
8. Cost Effectiveness and Financial Resources
9. Growth Management, Land Use
10. Constructability
Columbia River CROSSING
Key Decision Point

P-083-001

How Do I Leave Comments Today?



- Write your ideas on a green comment form
- Type them out at a laptop computer station
- Dictate them at the verbal comment station

Columbia River CROSSING

P-083-001


Other topics in 2007
The Draft Environmental Impact Statement will address these issues in 2007.
Public transit – Where should it go? Where should we build stations and "park 'n' rides"?
Freight improvements – at interchanges for connections and safety
Efficiencies – ideas like ramp meters, incident response, ridesharing, telecommuting
Bicycle / pedestrian improvements
Air quality, noise reduction
Environmental effects – water quality issues
Cultural and historical resource protection
Managed lanes
Tolling
Bridge type, appearance, and alignment (upstream or downstream)
We will continue to seek your input regarding these topics
Columbia River CROSSING
Next Steps

P-083-001


Talk With Us
Contact us with your comments, questions and ideas.
E-MAIL feedback@columbiarivercrossing.org
MAIL 700 Washington St., Suite 300, Vancouver, WA 98660
FAX 360-737-0294
PHONE 360-737-2726 or 503-256-2726
WEB www.columbiarivercrossing.org
PODCAST www.wsdot.wa.gov/inform/downloads/ColumbiaRiverCrossing.mp3
Columbia River CROSSING
Public Comment


How Public Involvement has Informed the Project
P-083-001
Public comments have helped shape each decision step:
Generating ideas: Fall 2005
Evaluating ideas & narrowing options: Spring 2006
Preliminary design workshops: Summer/Fall 2006
Bridge and Transit options: November 2006 – February 2007
Columbia River CROSSING
Public Comment

P-083-001

We Heard You!

Examples of how your ideas have helped shape the CRC project.



You said:
Places in our neighborhoods like grocery stores, parks, houses of worship, schools, and trails are important assets.

We are:
Continually updating our neighborhood resource maps to help the project avoid or minimize impacts.

You said:
Host a January open house on Hayden Island.

We are:
Tuesday, January 30, 2007
6:30 – 8:30 p.m.
12050 N. Jantzen Drive
(the former Hayden Island Yacht Club)

Columbia River CROSSING Public Comment

P-083-001

We Heard You!

Examples of how your ideas have helped shape the CRC project.



You said:
- Express bus service and
- A non-stop ride between Clark County and Portland are essential.

We are:
Recommending express bus service in both transit options.

You said:
- Make travel safe and easy for freight.

We are:
Designing flatter grades and gentler curves at key freight onoff ramps: e.g., Mill Plain and Marine Drive.

Columbia River CROSSING

Public Comment

P-083-001

We Heard You!

Examples of how your ideas have helped shape the CRC project.



You said:
- Safe and easy access to bike and pedestrian connections are vital to the project.

We are:
Analyzing the best ways to make these connections.

You said:
- Avoid conflicts with river and air traffic.

We are:
Recommending a bridge without a lift span which avoids aviation air space.

Columbia River CROSSING

Public Comment

Hines, Maurice

From: andrew neerman [blueruinpdx@gmail.com]
Sent: Monday, October 24, 2011 8:41 PM
To: Columbia River Crossing
Subject: FEIS Comment

P-084-001

I am writing to express my opposition to the CRC as currently conceived. This is a bloated freeway-expansion project that will encourage sprawl in Clark County, greatly worsen the bottleneck at the Rose Quarter, and potentially send many more vehicles onto surface arterials in North and Northeast Portland (areas that have already suffered greatly due to freeway construction, misguided "urban renewal", racism, economic disadvantage, and environmental injustice). It is grossly out of step with the contemporary priorities and values of this region and I strongly urge the Federal Highway Administration and Federal Transit Administration to reject the FEIS.

Several alternatives have been proposed that are more sensible and affordable. We need to start over and have a much more inclusive and transparent planning process that examines how the region can design, fund, and build a project that is lean, smart, and sustainable. Additionally, congestion tolling should be implemented now on both current Columbia crossings (I-5 and I-205) with the intention of reducing existing congestion and building up a fund for a future project that includes, among other things, construction of an arterial bridge between N Portland and Vancouver that can carry local traffic as well as MAX light rail and bike/pedestrian facilities.

Elected officials at both the State and Federal level have expressed their dissatisfaction with both the planning process and the projected cost. Lawsuits are guaranteed if the project continues to move forward. A campaign of direct action aimed at preventing construction is also likely.

Not only can we not afford the CRC, it is a terrible idea that will negatively impact the region for decades to come.

Sincerely,
Andrew Neerman
NE resident and business owner

--
http://www.blueruinpdx.com

He who binds to himself a joy
doth the winged life destroy;
but he who kisses the joy as it flies
lives in eternity's sunrise
--William Blake

P-084-001

As described in Chapter 3 (Section 3.4) of the FEIS, and in the Indirect Effects Technical Report, highway capacity improvements and access improvements can induce development in suburban and rural areas that were not previously served, or were greatly underserved, by highway access. The DEIS outlines a comprehensive analysis of the potential induced growth effects that could be expected from the CRC project. A review of national research on induced growth indicates that there are six factors that tend to be associated with highway projects that induce sprawl. These are discussed in the Indirect Effects Technical Report. Based on the CRC project team's comparison of those national research findings to CRC's travel demand modeling, Metro's 2001 land use / transportation modeling, and a review of Clark County, City of Vancouver, City of Portland and Metro land use planning and growth management regulations, the FEIS concludes that the likelihood of substantial induced sprawl from the CRC project is very low. In fact, the CRC project will likely support the region's goals of concentrating development in regional centers, reinforcing existing corridors, and promoting transit and pedestrian friendly development and development patterns. The region's goals are reinforced by the project's location in an already urbanized area, the inclusion of new tolls that manage demand, the inclusion of new light rail, and the active regulation of growth management in the region.

In October, 2008, the project convened a panel of national experts to review the travel demand model methodology and conclusions, including a land use evaluation. The panel unanimously concluded that CRC's methods and the conclusions were valid and reasonable. Specifically, the panel noted that CRC would "have a low impact to induce growth…because the project is located in a mature urban area," and that it would "contribute to a better jobs housing balance in Clark County…a positive outcome of the project". These results are summarizes in the "Columbia River Crossing Travel Demand Model Review

Report" (November 25, 2008).

In 2010, Metro ran the MetroScope model (an integrated land use and transportation model) to forecast growth associated with transportation improvements of a 12-lane river crossing and light rail to Clark College. Even with a 12-lane river crossing, the model showed only minimal changes in employment location and housing demand compared to the No-Build Alternative.

For a more detailed discussion regarding potential indirect land use changes as a result of the CRC project, including the likely land use changes associated with the introduction of light rail, please see Chapter 3 (Section 3.4) of the FEIS.

The Oregon Department of Transportation (ODOT) completed Phase I construction of the I-5 Delta Park widening project in fall 2010. Phase I of the project involved widening I-5 and lengthening the entrance and exit ramps at Victory Boulevard and Columbia Boulevard. Phase II involves improving local streets and will begin when funding is secured. Phase I of the Delta Park project widened the current 2-lane segment of southbound I-5 to 3 lanes. There are currently no immediate plans to widen I-5 south of Delta Park. Neither the CRC project nor the Delta Park projects are intended to address the southbound traffic congestion that currently exists near the I-5/I-405 split. However, traffic analyses show the congestion at the split will not be worsened because of the Columbia River Crossing project. The main reason is that fewer cars are expected to cross the river with a project in 2030 than without a project. This is due to the provision of improved transit service and tolling.

Beyond the CRC and Delta Park projects, the I-5 Transportation and Trade Partnership Final Strategic Plan recommended a comprehensive list of modal actions relating to: additional transit capacity and service; additional rail capacity; land use and land use accord; transportation

demand/system management; environmental justice; additional elements and strategies (such as new river crossings); and financing. RTC and Metro are tasked with initiating recommendations as part of their regional transportation planning role. Examples of current efforts include RTC's evaluation of future high-capacity transit in Clark County, and evaluation of needs for future river crossings. Regional planners have investigated solutions to existing bottlenecks at the I-5 connections with I-405 and I-84. ODOT is responsible for conducting ongoing studies to identify other congestion problems on I-5 in Oregon that may need to be addressed in the future.

Tolling cannot typically be implemented on an existing interstate highway unless substantial improvements are also made. Pre-construction tolling on the I-5 crossing may be possible.

An arterial bridge option between Vancouver and Portland was studied in the early CRC alternatives evaluation process, and was dropped because it did little to address the purpose and need for the project (see Chapter 2 of the FEIS).

Hines, Maurice

From: LM Patella [lmpatella@comcast.net]
Sent: Monday, October 24, 2011 7:26 PM
To: Columbia River Crossing
Subject: Problems with Columbia River Crossing
Attachments: CRC comments.docx

To Whom it may concern,

P-085-001 Attached are my comments on why the Columbian River Crossing project should not be funded.

Lawrence M. Patella
CDR USN (ret)

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

P-085-001

Thank you for taking the time to submit your comments on the I-5 CRC FEIS.

To whom it may concern,

P-085-001 I Lawrence M. Patella, Commander United States Navy Retire, Strongly object to the States of Washington and Oregon, the Columbia River Crossing, Portland's Tri-met, Clark County C-Tran, Vancouver City Council and Clark County's Board of commissioner's misleading the citizens of Clark County Washington and Portland Oregon about the need, the cost and the reason for demolishing a perfectly good Bridge for the sole purpose of bringing Light Rail across the Columbia River to Vancouver Washington.

P-085-002 Not only have these local politician been misleading the public they have been working behind the scenes and have Cancelled a promised 2011 Vote Light Rail. They have lobbied the state legislatures to create new and change existing legislation that will allow them to proceed with the expenditure of 10 billion tax payer dollar so they can to "Ram Down the Tax Payer's Throats" excessive property taxes, fees, Bridge tolls, and the sale of revenue bonds to fund a small portion of the building of a 10 billion dollar Light Rail platform across the Columbia River.

P-085-003 Acutely aware that Vancouver, Washington does not have sufficient population density to support the proposed 10 billion dollar Columbia River Crossing project, Clark County's Transit Authority has, in spite of the fact that their assets exceed their liabilities by some 114 million dollars and have a 50 million dollar are attempting to impose an outrageous tax increase to increase bus ridership in an attempt to show that there is sufficient bus ridership to support light rail. Below are two presentations that I have made to educate the voter that they are being taken to the Cleaners.

P-085-004 Why are local politicians, including most of the Vancouver City Council and two thirds of the Clark County Commissioners allowing Columbian River Crossing Planners to mislead the public.

In case you missed it, Eric Florip (Columbian Staff Writer) Article "TRAFFIC UNCERTAINTIES FAIL TO HALT CRC PROCESS" in yesterday fish wrapper says volumes about their inability to manage the project.

Are they so anxious to waste 10 billion (not the bogus 3.1 billion they would like you to believe) taxpayer dollars that they would deliberately leave out of the Final CRC Environmental Impact Statement updated traffic information that clearly shows the information they submitted is over inflated.

Now why would they do that: Let's examine their reasons for not submitting accurate information to the decision makers? But first Lets revisit the reason the local tax and spend politicians said we need this gigantic Boondoggle.

They Said: Transportation on I-5, the most important transportation artery on the entire west coast of the United States is so congested that it is adversely impacting the economic development on the entire west coast.

Here is why they don't want the decision makers to know what we taxpayers have known all along. I-5 is not congested. The purpose of the Bridge Boondoggle is to provide a platform for bringing Light Rail the Gravy/Crime Train from Portland to Vancouver.

But I digress let's get back to the CRC Planners misleading statements.

P-085-002

There will not be a public vote on construction of the various CRC project elements. However, as a public project, it must be approved and funded by the decisions of elected officials who are themselves directly elected by voters. Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on pursuing a public vote.

P-085-003

Light rail has been endorsed by every local Sponsoring Agency (Vancouver City Council, C-TRAN, RTC, Portland City Council, TriMet, and Metro), whose boards include elected officials from throughout the area.

Annual light rail passenger trips crossing the I-5 bridge in 2030 are projected to be 6.1 million, with daily ridership around 18,700. The travel time for the morning commute by light rail between downtown Vancouver and Pioneer Square in downtown Portland will be approximately 34 minutes. Light rail would travel on a dedicated right-of-way, with more reliable travel times than auto drivers dealing with unpredictable road conditions, traffic congestion, and parking challenges.

The CRC project planning for light rail incorporates and supports the principles of Vancouver's City Center Vision Plan. Downtown Vancouver has seen recent growth in higher density mixed use projects from three to 12 stories in height. In addition, another 4,000 downtown condominiums are proposed or pending as part of new developments. The core of Vancouver has, along with many of the larger corridors such as Fourth Plain Blvd, medium to high density residential development and an urban mix of uses. Transit demand in these areas is quite high, and ridership will increase with the introduction of light rail.

P-085-004

a. The CRC Traffic forecast may not be updated until 2013. Isn't that when they plan to break ground. It must be their plan to stay away from the reduced traffic numbers until the fed approve the environmental impact statement already submitted.
b. Anne Pressentin (CRC Spokeswoman): "We are looking for very much the long Horizon. Even if traffic counts don't climb as soon as originally projected, it doesn't mean that it is not going to happen". But I thought Current Congestion was a huge problem, now that the numbers are not there it is no big deal. Baloney.
c. Andy Cotugno, (Policy adviser with Portland's Metro): In response to the question how much traffic will steer clear of I-5 once polling starts, he said: "That answer will wait until 2013 – and with good reason. When CRC planners go to borrow money for the project they will need to do so with the most current data possible before tolls pay it back".

   I have no idea what the hell he is talking about. I can however tell him that one of two things will happen. Motorist will flock to I-205 or a toll will be put on I-205. Duh!

d. Nancy Boyd: She said: Leaving older, higher traffic projection in the environmental impact statement are a better reflection of the highest possible impact.

   Nancy, please don't insult our intelligence, leaving the higher, bogus, numbers in the EIS will Give your inaccurate Environmental Impact Statement a better chance of being approved.

e. And how about Cotungo saying: "If Clark County continues to struggle with double-digit un-employment, residents may end up battling Interstate 5 bridge traffic to find work".

   What a crock. And I thought as our Good Mayor, who was against bridge tolls before he was for them said once the bridge, light rail and tolls were in place new industries, business and job would be coming to Vancouver.

   And so it goes

   L. M. Patella
   CDR USN (ret)

P-085-005

Good Morning, Thank you for the opportunity to speak to this Council on what I consider C-Tran's Outrageous attempt to dig deeper and deeper into the taxpayer's pockets. For those of you who do not know me, I am Larry Patella, A retired Naval Officer, who commanded three ships during my 31 years in the United States Navy. I am a Former Manager of the Port of Portland's Navigation Division where I managed for 21 years, under contract to the Corp of Engineers the Maintenance Dredging of the Columbia River Navigation Channel. In those positions, I have over some 52 years seen enough waste of taxpayer dollars to make the most ardent spender of taxpayer dollars extremely ill. I am currently the Executive Director of the Western Dredging Association, a non-profit educational association that covers the Western Hemisphere. The goals and objectives of Western Dredging Association are to promote the exchange of information and knowledge as it relates to dredging, navigation, marine engineering and construction, as well as the enhancement of the Marine Environment. To fill my spare time I recently opened, a small business in the Carter Park Neighborhood in an attempt to do a little of my own revitalization and job creation.

Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on having a public vote.

P-085-004

Significant work has gone into developing the CRC project, including an ongoing public involvement effort. The public involvement program includes numerous advisory groups to ensure the values and interests of the community are reflected in project decisions. These groups include representatives of public agencies, businesses, civic organizations, neighborhoods and freight, commuter and environmental groups. Feedback from the general public and advisory groups has been generally supportive of the project, including support for the transit, bicycle, pedestrian, highway, interchange, and financing elements of the project. See Chapter 2 (Section 2.7) of the FEIS for more discussion on the process used to develop project alternatives and select a Locally Preferred Alternative.

By 2030, the region's population is expected to increase by one million people. This increase will result in more people needing to travel between home, work, school, recreation, etc. In 2005, 135,000 vehicles crossed the Columbia River on the Interstate Bridge, which led to 4-6 hours of congestion each weekday. By 2030, 184,000 are predicted to cross the river, which would lead to 15 hours of daily congestion if no action is taken.

Congestion occurs when vehicle demand is greater than a transportation system's capacity. It results in slower speeds and increased travel times. CRC defines congestion as vehicles traveling less than 30 mph. The Columbia River Crossing project uses information gathered from Metro's nationally-recognized travel demand models to determine the project's effect on congestion. These models predict trip frequency, types or modes of transportation, destination, and time of day. Transportation

P-085-005

That said I will get right to the point. There is no need for the empire building C-Tran to continue on almost a yearly basis to dig deeper and deeper into the people's pockets. I am certain you are thinking how or why I would or could make such a statement.

Here is how and why. Are you aware that included in C-Tran's Annual Financial Report for the year ending December 31, 2010, signed by C-Tran Officers Jeff Hamm and Diane O'Reagan, is Brian Sonnatag, Washington State Auditor's final analysis concerning the financial health of C-Tran. He stated:

"The assets of the PTBA (C-Tran) exceeded on December 31, 2010, liabilities by 114,751,751 Taxpayer Dollars. He went on to say, of this amount 49,717,245 taxpayer dollars may be used to meet C-Tran's ongoing obligations to provide service to the public, including capital programs, and to meet its other obligations.

Historically, C-Tran has only spent an average of approximately 6 or 7 million of the reserve funds in any given year. So why is C-Tran now, with Taxpayers facing the worst economic crisis since the Great 1929 Depression planning on depleting the Taxpayer's Reserve Fund? C-Tran documents tell me that by the end of 2011 only 4 million dollars will be left in the Taxpayer's Reserve Fund.

There can only be one of two answers for this unusual expenditure of taxpayer dollars. One is C-Tran and its Board of Directors are unable to run C-Tran as a business, or C-Tran and its Board of Directors are deliberately depleting the taxpayer's reserve fund so they can demonstrate to the taxpaying public they are in dire need of additional taxpayer dollars.

Ladies and Gentlemen, now is not the time, what with 12.3 % of Clark County Citizens unemployed, losing their homes, not knowing where their next dollar is coming from to impose any additional taxes. C-Tran like the people they are duty bound to serve needs to stop its empire building schemes and concentrate on their primary goals and objectives. Those Goals and Objectives are in my opinion to provide cost effective, efficient and needed bus service. Running empty busses in and around Clark County is not something anyone could or should consider cost effective, efficient or needed. It is in the opinion of many simply empire building and a waste of Taxpayer dollars.

From the information available to me, it does not appear that C-Tran Staff or its Board of Directors have any idea how much service Clark County needs? I say this because on March 9th 2011 in an email to me, Marc Boldt County Commissioner and C-Tran Board Chairman admitted many C-Tran Busses are running around Clark County Empty. In his email, a copy has been provided to you, he states "If we cannot get busses full we need to start cutting the ones that are empty". Marc also stated and I Quote "I do not want to take anyone one from their car." He also advised me that none of the revenues from yet another sales tax increase will be used for light rail.

Let's further examine these statements. When I compare information sent to me in the numerous emails exchanges with the C-Tran Board Chairman and the mountain of C-Tran documents obtained via the Washington Public Disclosure act and C-Tran's Statement For

planners use these models to analyze the effects of such factors as increased population and employment, transportation improvements, and new developments on the transportation system.

Based on the Metro model's past ability to predict transportation effects, the CRC project is confident in the data received from Metro and uses it to determine what impact the project will have on congestion. The improvements proposed by the project to the highway and seven interchanges will help better accommodate increased future vehicle traffic. New auxiliary lanes and longer on/off ramps will allow safer and more efficient merging and weaving to enter or exit the freeway. Narrow lanes and shoulders will be widened to current standards. Shoulders will be added where they are currently missing. All of these changes will improve the flow of traffic in the bottleneck area of the Interstate Bridge.

P-085-005

This comment refers primarily to C-TRAN's budget and the author's commentary on C-TRAN's use of funds. In response to the portion relevant to CRC, long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on having a public vote.

P-085-005

Proposition 1, I am at a loss to understand why C-Tran is, during this current economic Crisis that has our City, County, State and Nation millions, billions and trillions of dollars in debt, misleading the public.

Having admitted that many C-Tran busses are running around Clark County Empty why is C-Tran now using threats in their outrageous attempt to raise taxes. Why are they threatening to cut 35% of all services? Why not as Commissioner Boldt suggested, just cut the empty busses? Why not redesign the entire system so that it is more effective, and more efficient. Why not reduce or eliminate the wasteful spending of taxpayer dollars on so called capital projects. For instance, if millions and millions of taxpayer dollars have to be spent to build park and ride lots, some with elegant buildings or multi-level parking garages for the dreaded automobile, then it probably is not, with only an average of 7 bus rider per trip worth the taxpayer's money or efforts.

As for the Commissioners statement that new tax revenues will not be used for Light Rail, not true. C-TRAN Tax revenues have and continue to be used to support and promote light rail. 3 million dollars were spent 5 or six years ago on light rail planning and studies. The mere fact that the CRC project will not be built without light rail and C-Tran has and continues to support with our tax dollars, the CRC project, it is proof enough that past, current and future tax dollars Picked from the taxpayer's pockets has, is and will be used to support bringing light rail to Clark County. It appears the only purpose of Proposition 1 is to replenish what has already been spent on Light Rail.

May I be so bold as to ask all C-Tran Staff, C-Tran Board Members and those of you in this room, a simple question? A question that all who spend taxpayer dollars should ask themselves.

If the money C-Tran is picking from the taxpayer' pockets and is spending was yours, your personal funds, funds that would take food out of your children's mouths and adequate shelter away from them would you do it?

As for C-Tran Board Chairman not wanting to take people out of their cars, why then did he include in his Statement for Proposition 1 "C-Tran Serves you by taking cars off our roads and highways".

Now I ask you, do you really think running empty busses transporting approximately 2% of the commuting public around Clark County can or will ever take any cars off our roads and highways. Of course not. The Automobile is and has been one of the most important economic engines the Good Ole USA ever had. Just think for a minute about the great number of jobs that buying, owning and using an automobile has created. And please Can someone, anyone explain to me why Cars have to be taken off the road for a super expensive transit system to be successful.

I would like to leave you with two thought. They are:

P-085-005

1. Ask any high school graduate if they would rather have an automobile or lifetime bus or light rail pass as a graduation present and
2. Do you know how to Spell Automobile. If not the correct spelling is F R E E D O M.

In Closing, All need to understand that the only money that C-Tran has is what it takes from the taxpayers. C-Tran does not need to dig deeper and deeper into the taxpayer's pockets to provide a first class bus service. As Custodians of the taxpayer's hard earned dollars C-Tran has a fiduciary responsibility to properly manage the taxpayer's dollars. C-Tran's empire building needs to stop; C-Tran needs to prioritize spending. C-Tran needs to learn that nothing is free, including Tinted Window Busses bought with tax payer dollars that come out of our other pockets. C-Tran needs to understand not only do we not have a bottomless pit of money, that it cost money and lots of it just to own busses, buildings, and property. And if they, who get to spend taxpayer dollars, are having perceived difficult financial problems, just think about the problems those of us who are having our pockets picked have.

Thank You

L. M. Patella
CDR USN (ret)

Hines, Maurice

From: Jimme Peters [jimme@24-7consulting.com]
Sent: Monday, October 24, 2011 7:17 PM
To: Columbia River Crossing
Subject: Comments on refined bridge project plan

To Whom It May Concern-

P-086-001

As a volunteer that sat on the CRC Advisory Committee for three years, lives on the island, sat on the HINooN Board of Directors for two years, and has participated in the HINooN CRC presentations recently, I was shocked to see the new project plan. We all sat in the meetings, stated our concerns and were told/shown the plans based upon the needs of the island and we voted accordingly on the options to best accomplish the overall objectives.

Then, all of sudden, there are significant changes made without any discussion that are not suitable for the community. On paper, moving things around seems trivial, but when it drastically affects our neighborhood, it becomes very difficult. The removal of the light rail station and not having arterial access during construction are just the starting flaws that are problematic. This altering of the plan without any input is a major breach of trust and completely violates the concept of supposed public process. Please realign your plans with the needs of our community and uphold the commitments that were made to make this project viable for all of us.

Thank you,

Jimme' Peters
503.816.0500

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P-086-001

The design has evolved based on public information and further technical analysis. These evolving designs have been brought to numerous meetings on Hayden Island and elsewhere.

The possibility of early construction of the local multimodal bridge will continue to be a consideration by the project as project sequencing is refined. It is also discussed in Chapter 2 of the FEIS, (Section 2.3.1), but not as mitigation. Although it is not appropriate to describe the early construction as mitigation, it is discussed as something we will explore as we further refine construction staging. Specifically Section 2.3.1 of the FEIS states:

> Similarly, the Marine Drive interchange construction would need to be coordinated with construction of the southbound lanes coming from Vancouver. While this interchange can be constructed independently from the work described above, the completion and utilization of the ramp system between Hayden Island and Marine Drive requires the work to occur in the same period. Early construction of the local multimodal bridge between Marine Drive and Hayden Island, so that it can be used as an alternate access route during the remaining construction period, will be analyzed during final design. The interchange reconstruction also needs to occur so that Marine Drive can be elevated, allowing the light rail extension to cross under Marine Drive. The Marine Drive interchange is expected to take a little more than 3 years to construct, including work at the Victory Boulevard interchange.

Hines, Maurice

From: Debbie Peterson [debbie@debbiepeterson.org]
Sent: Monday, October 24, 2011 11:39 PM
To: Columbia River Crossing
Subject: FEIS Concerns

P-087-001

1. Why wasn't a supplemental Environmental Impact Statement written, when the Box web design was eliminated and a new design was put in place?

1

P-087-001

A supplemental DEIS was not required because the impacts of the composite deck truss fit within the parameters of impacts evaluated in the DEIS. The DEIS did not evaluate a single bridge type. It evaluated an envelope of impacts defined by vertical and horizontal parameters and general pier arrangements.

Hines, Maurice

From: Debbie Peterson [debbie@debbiepeterson.org]
Sent: Monday, October 24, 2011 11:39 PM
To: Columbia River Crossing
Subject: FEIS Concerns

P-087-002 2. Why weren't updated finance models used?

1

P-087-002

Please refer to Chapter 4 of the FEIS for a description of the current plans for funding construction and operation of the LPA. This discussion provides an updated assessment of likely funding sources for this project, though it is not common practice to receive funding commitments prior to completion of the alternative selection process.

At Governor Kitzhaber's request, the Oregon State Treasurer conducted an independent review of the CRC's financing plan and released a report in July 2011. CRC incorporated the treasurer's recommendation in Chapter 4 of the Final EIS.

Hines, Maurice

From: Debbie Peterson [debbie@debbiepeterson.org]
Sent: Monday, October 24, 2011 11:41 PM
To: Columbia River Crossing
Subject: FEIS Concerns

P-087-003

3. Why weren't traffic models that reflect actual decrease use on I-5 used?

1

P-087-003

Traffic volumes fluctuate and did decrease during some years. Traffic volumes obtained from the Oregon Department of Transportation's automatic traffic recorder (ATR) monitoring sites show that traffic volumes have, in fact, been increasing in the last few years. Whether the traffic volumes forecast for year 2030 will actually be achieved in that year should not be the only consideration. In its July 27, 2010 report, the Independent Review Panel expressed concerns about a longer horizon. The IRP commented "The desirability of living in the Portland/Vancouver region is not going to diminish, so populations will continue to grow…. [T]he IRP believes the greatest risk in the decision-making process is not over-sizing the bridges but not building enough capacity for the next 100 years." [1]

[1] Warne, Thomas (2010). I-5 Columbia River Crossing Project, Independent Review Panel, Final Report. Independent Review Panel, Olympia, July 27, 2010.

Hines, Maurice

From: Debbie Peterson [debbie@debbiepeterson.org]
Sent: Monday, October 24, 2011 11:41 PM
To: Columbia River Crossing
Subject: FEIS Concerns

P-087-004

4. Why weren't traffic models used that reflected a decrease in I-5 useage as tolls went up, over the course of the years?

1

P-087-004

By 2030, the region's population is expected to increase by one million people. This increase will result in more people needing to travel between home, work, school, recreation, etc. In 2005, 135,000 vehicles crossed the Columbia River on the Interstate Bridge, which led to 4-6 hours of congestion each weekday. By 2030, 184,000 are predicted to cross the river, which would lead to 15 hours of daily congestion if no action is taken.

The Columbia River Crossing project uses information gathered from Metro's nationally-recognized travel demand models to determine the project's effect on congestion. These models predict trip frequency, types or modes of transportation, destination, and time of day. Transportation planners use these models to analyze the effects of such factors as increased population and employment, transportation improvements, and new developments on the transportation system.

The traffic forecast for the project was developed for the year 2030. The analysis does not provide estimates of throughput and demand for different periods throughout the presumed 100 year life span of the bridge. Not only is it required, locally and federally, to focus on the twenty year planning horizon, it is also the longest period for which modeling has been deemed reliable. Changes in socioeconomics, and transportation technology may change significantly over the next 50 years, making scientifically reliable estimates throughout that period very suspect and speculative.

However, the tolling and project funding analysis has looked at a longer period of time. At Governor Kitzhaber's request, the Oregon State Treasurer conducted an independent review of the CRC's financing plan and released a report in July 2011. CRC incorporated the treasurer's recommendation in Chapter 4 of the Final EIS. Following the Record of Decision, the project will complete an investment-grade tolling analysis

Hines, Maurice

From: Debbie Peterson [debbie@debbiepeterson.org]
Sent: Monday, October 24, 2011 11:42 PM
To: Columbia River Crossing
Subject: CRC FEIS Concerns

P-087-005 5. Why weren't episodic events and the pollution impact studied for the FEIS?

1

which will provide more specificity about the long term tolling revenue projections. The analysis of tolling did not assume that the tolls would increase in "real value" over time. As inflation has been estimated to rise at approximately 2.5% per year, the same annual increase was used as an assumption regarding the toll amount.

Details of the tolling system are still being refined as the project development enters the final design stage. The ultimate decision on any tolling options will be made by both the Washington and Oregon Transportation Commissions.

P-087-005

In air quality analysis, "episodic events" typically refer to those specific times that pollutant standards are exceeded. For some pollutants, weather conditions are associated with accumulation of emissions that then result in the exceedances. Weather conditions are included in the air quality modeling analysis conducted for the CRC EIS.

There have been no exceedances of standards in this region for many years, and forecasts estimate that pollutant levels will continue to decrease.

Hines, Maurice

From: Debbie Peterson [debbie@debbiepeterson.org]
Sent: Monday, October 24, 2011 11:42 PM
To: Columbia River Crossing
Subject: CRC FEIS Concerns

P-087-006 6. What happens if I-1125 passes? Will you do an SEIS (Supplemental Environmental Impact Statement) for that financial scenario

1

P-087-006

A change in financing would be unlikely to require a supplemental DEIS. However, any change that occurs to the project will be reviewed to determine if it would change impacts. Those changes that would make a meaningful difference in impacts will be reviewed to determine if any supplemental analysis and documentation are required.

Hines, Maurice

From: Debbie Peterson [debbie@debbiepeterson.org]
Sent: Monday, October 24, 2011 11:44 PM
To: Columbia River Crossing
Subject: CRC FEIS Concerns

P-087-007

9. Why as there been no economic forecast of the cost to business that will be remaining throughout construction?

1

P-087-007

The project has not attempted to quantify the potential profit/loss effect of construction on adjacent businesses, but the project has considered, and the FEIS recognizes, that temporary traffic changes, noise, and other construction activities will affect these businesses. The FEIS also identifies mitigation for reducing those impacts (Sections 3.4.4 and 3.4.5). The project also commits to coordinate and communicate with business owners to help further define this mitigation.

Hines, Maurice

From: Debbie Peterson [debbie@debbiepeterson.org]
Sent: Monday, October 24, 2011 11:45 PM
To: Columbia River Crossing
Subject: CRC FEIS Concerns

P-087-008

8. What happens when The City initiative is presented on the ballot - with no City monies or employee support of the LPA is allowed?

1

P-087-008

The result of any initiatives approved by voters that affect the project would need to be addressed. We can not say in advance how initiatives that are not yet on the ballot would affect the project.

Hines, Maurice

From: Debbie Peterson [debbie@debbiepeterson.org]
Sent: Monday, October 24, 2011 11:49 PM
To: Columbia River Crossing
Subject: CRC FEIS Concerns

P-087-009 | 10. Why is there no contingency money set aside for those businesses that will be hurt by the construction over seven years?

1

P-087-009

Direct payments to such businesses are not proposed, but the project has committed to funding measures to help reduce impacts to these businesses (see Section 3.4.5 in the FEIS).

Hines, Maurice

From: Debbie Peterson [debbie@debbiepeterson.org]
Sent: Monday, October 24, 2011 11:59 PM
To: Columbia River Crossing
Subject: CRC FEis Concerns

P-087-010

subsequesnt Changes and Analysis -- When was the information you hae shown compiled and prepared? What is the current "locally Preferred Alternative?
How much of teh analysis and data that you have been shown was created or compiled after April 2008? Tom Buchele goes on to say to the IRP. "I have no doubt that the vast majority of what the CRC has shown you fits that description and therefore was not and could not have been included in the DEIS. Why did CRC issue a DEIS before compiling this information and before conducting this analysis? The CRC in fact intends to dump all of most of this new analysis anbd information into an FEIS - which is too late for meaningful public participation under NEPA.

My question is. WHy did CRC do that as indicated in the last sentence?

1

P-087-010

A description of the locally preferred alternative is in Chapter 2 of the FEIS. The LPA is also described in the Record of Decision, and referred to as the Selected Alternative.

The information in the FEIS, that was not in the DEIS, reflects comments received on the DEIS, updated analysis, refined design information, and other information and input received after the issuance of the DEIS. This is the usual process when moving from a DEIS to an FEIS. At the beginning of each section of Chapter 3 in the FEIS is a summary of what information in that section is new since the DEIS. Much of this new information was provided to the public during the outreach that occurred between the DEIS and the FEIS. Please see the responses to O-002 for more information regarding the questions about comments by Tom Buchele and information and analysis completed after the DEIS.

Hines, Maurice

From: Daniel M. Potter [danielmpotter77@gmail.com]
Sent: Friday, October 21, 2011 3:59 PM
To: Columbia River Crossing
Subject: CRC

P-088-001

Build the bridge ASAP with NO tolls and NO light rail! If mass transit must be included, use rapid BUS transit as it is less expensive, safer, and can be changed/moved.

Thank you,

Daniel M. Potter
North Portland

Daniel - danielmpotter77@gmail.com

P-088-001

The selected alternative includes both light rail and tolls. The rationale for this is discussed in Chapters 1, 2 and 4 of the FEIS. You are correct that bus rapid transit routes can be more easily moved than light rail transit routes, but even they involve relatively substantial capital construction and run in a separate guideway. See the EIS discussion of costs, and safety comparisons of LRT and bus rapid transit.

Hines, Maurice

From: Brian Riley [bgrmosaic@gmail.com]
Sent: Monday, October 24, 2011 11:36 PM
To: Columbia River Crossing
Subject: Just please consider...

P-089-001 The issue is car traffic and how to alleviate it.

My concern is the easier you make the Columbia River Crossing for car traffic, the more car traffic you invite to use it, (I just don't want to see the region back with the same issue of car traffic 20 years down the line).

P-089-002 Regarding the light rail extension, There is another way to extend the light rail to Vancouver, alleviate a lot of commuter traffic on the I-5 and increase the service on AmTrak between Vancouver, WA and Portland, OR.

If possible, would love to discuss that solution further, Thank You.

1

P-089-001

The proposed new add/drop lanes (i.e., lanes that connect two or more interchanges) are used to alleviate safety issues associated with the closely spaced interchanges in the project area and are not designed to increase capacity generally on I-5. 68% to 75% of I-5 traffic within the project area enters and/or exits I-5 within the CRC project area, and these add/drop lanes provide space for this traffic to do so without disrupting cars and trucks traveling to destinations further north and south of the project area. The project does not propose to add lanes north or south of the project limits.

The DEIS evaluation found that the project, with a toll and light rail, would actually reduce the total daily volume of traffic using the I-5 and I-205 river crossings by approximately 3%. The FEIS analysis of the project has been updated to include an evaluation of how the CRC project would affect Vehicle Miles Traveled (VMT) (see Chapter 3, Section 3.1). Rather than inducing sprawl, the CRC project will likely reinforce the region's goals of concentrating development in regional centers, reinforcing existing corridors, and promoting transit and pedestrian-friendly development and development patterns. In 2010, Metro ran the MetroScope model (an integrated land use and transportation model) to forecast growth associated with transportation improvements of a 12-lane river crossing and light rail to Clark College. The model showed only minimal changes in employment location and housing demand compared to the No-Build. For more information see FEIS Chapter 3, Section 3.4.

P-089-002

Specific suggestions are welcomed through the feedback email listed on the project website at http://www.columbiarivercrossing.org/ContactUs.asp or can be discussed by calling the project office. The Record of Decision recongizes the LPA's light rail alignment as the

Selected Alternative for construction. Creative ideas about the design and operation of the system are still welcome.

Hines, Maurice

From: Mark Robinowitz [mark@oilempire.us]
Sent: Monday, October 24, 2011 10:26 PM
To: Columbia River Crossing
Subject: Final EIS comment and request for Supplemental Draft EIS
Attachments: crc-sdeis-request.pdf

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www.road-scholar.org
Peak Traffic: Transportation Triage at the End of the Age of Oil

www.sustaineugene.org
Green Eugene or Greenwash?
Big Steps to Sincere Sustainability

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

Columbia River Crossing
Final Environmental Impact Statement
Request for Supplemental Draft EIS

Mark Robinowitz - www.Road-Scholar.org
"Peak Traffic: Transportation Triage at the End of the Age of Oil
Box 51222 - Eugene, OR 97405 - mark@permatopia.com

Comments submitted October 24, 2011

P-090-001 A Supplemental Draft EIS is needed to redo the asssumptions that Vehicle Miles Traveled will continue to increase even as energy supplies decline.

While it is nice that the Final EIS admits that Peak Oil is a concern, the discussion is so erroneous that a SDEIS is needed to revise the basic assumptions of the project.

P-090-002 The Final EIS does not mention that traffic levels in Oregon have peaked, nor is there any substantial discussion of the decline of the energy supplies that run traffic levels in the study area.

P-090-003 The Final EIS admits that Alaskan oil peaked in 1988 but it does not mention that flow rates have declined two-thirds since that peak and are approaching a "low flow" condition where flows may not be able to be maintained in the Arctic winter. When the Alaska Pipeline no longer flows in the winter, what part of the world will give up some of their energy usage so that Cascadia can maintain petroleum consumption?

The Alyeska Pipeline "Low Flow" study should be reviewed for the implication for traffic patterns in the Pacific Northwest, both the study area for this project and the region as a whole. A cut off of petroleum supplies from Alaska would have major implications for the economy and travel demand. Currently, the Alaska Pipeline has about 600 thousand barrels per day. When the flow declines to 500 thousand per day it may no longer be possible to sustain oil flows. The Alyeska Pipeline company is trying to determine if the Pipeline can be continued to lower flows than this, but even if this is technically possible it is reasonable to assume that the Alaska Pipeline will be over as an energy source before the 20 year planning horizon for the Columbia River Crossing.

P-090-001

Mr. Robinowitz states that a Supplemental DEIS is needed to sufficiently address peak oil. The DEIS and FEIS discuss peak oil in Section 3.19, Cumulative Effects, and consider impacts of peak oil on the project and the project on peak oil. A supplemental draft is required if there is new information or changes to alternatives resulting in new significant impacts not previously discussed in the draft. Little has changed regarding peak oil since the publication of the DEIS. FTA and FHWA believe that the treatment of the issue is legally sufficient and does not require a Supplemental DEIS.

As discussed in the DEIS and FEIS, significant increases in oil prices can have both short term and long term effects on travel behavior. In the short term, the options for responding to rising gas prices are more limited, and include making no changes in behavior other than paying more for fuel, driving less and/or changing from driving to walking, biking or transit for at least some trips. During recent increases in gasoline prices, transit use increased and off-peak highway travel decreased. Peak period highway travel changed little.

Over the long term, there are more options for adjusting to changes in gasoline prices, besides changing driving behavior. Technological advances and legislative mandates can increase fuel efficiency standards in the long term. In turn, as older vehicles wear out, more consumers can replace them with more fuel efficient vehicles. Automobile manufacturers are developing and will continue to develop new vehicle and engine technologies that require much less, or even no, petroleum-based fuels. This trend is already happening as evidenced by the growing popularity of gasoline-electric hybrid and electric vehicles.

Mr. Robinowitz's comment states that national and regional vehicle miles traveled (VMT) are on the decline and will continue to decline, therefore "peak traffic" has been reached. Traffic counts showed a short term

P-090-004 My comments on the Draft EIS were not addressed in the Final EIS, and they are resubmitted for the record of the Final EIS along with background information on Peak Oil and Peak Traffic.

www.sustaineugene.org/columbia-river-crossing.html
CRC Peak Traffic Alternative, comments submitted for the Draft EIS, 2008

www.road-scholar.org/peak-traffic.html
why Peak Oil and Peak Traffic require an end to highway expansion, we will have a hard enough time maintaining what has already been built on the energy downslope

P-090-005 The Final EIS claims estimates of Peak Oil range from 1990 to 2040. No one seriously proposes either end of this range.

The earliest predictions of global Peak Oil were made by geologist M. King Hubbert, who originally estimated that it would occur in the mid 1990s. He qualified this prediction noting that it could be delayed about a decade if there were conservation efforts that reduced consumption, which is exactly what happened (in large part due to the price shock of the 1973 Arab oil embargo).

Former University of Oregon petroleum geologist Walter Youngquist estimated in the 1990s that the global peak would happen around 2007. He looked at petroleum figures from 42 countries to make his prediction (abstract attached to these comments). This is about as close as anyone got. Focusing on the exact peak is not important, as long as the correct decade is considered. Any energy plan that assumes a half century range of timing for the peak is useless and wrong.

The most pollyanna predictions by geologists for global Peak are still well before 2040.

P-090-006 During the time period of the CRC study global oil production peaked and is now on a bumpy plateau. NEPA states that "new circumstances" relevant to a study need to be examined in a Supplemental Draft EIS. If reaching Peak Oil and Peak Traffic is not a new circumstance then nothing is.

decline in many kinds of trips, but that has reversed and volumes are again growing. Transportation modeling utilized by the CRC project forecasts that VMT in the project area will continue to rise as the population in the Portland-Vancouver metro area continues to increase. Please see the responses to comments in letter P-047 regarding traffic counts and forecasts.

P-090-002
Please see response to P-090-001.

P-090-003
Please see response to P-090-001.

P-090-004
Please see the response to comment P-090-001 above. The FEIS may not reflect Mr. Robinowitz's recommendations but comments were responded to. Responses to comments received during the DEIS review period were published on the CD included with the FEIS or FEIS summary and on the project's website.

P-090-005
Please see response to P-090-001.

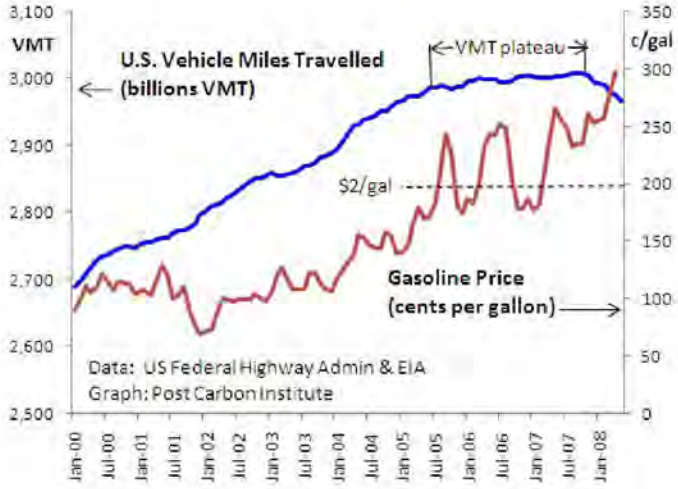
P-090-006
Peak oil was considered in the DEIS and is not a new issue that has arisen since the DEIS was published. Please see the response to comment P-090-001 above.

P-090-007 Peak Oil for "all liquids" was 2008 and given decline of the largest fields it's unlikely that offshore drilling, tar sands and other extreme measures will make up the difference. The new "Bakken" oil field in North Dakota is difficult to extract and lacks the "energy density" or "net energy" of previous petroleum supplies. We are scraping the bottom of the barrel to go after the lower grade, more expensive supplies, but they are unlikely to offset the depletion of the supergiant fields such as Prudhoe Bay (Alaska), Cantarell (Mexico), Ghawar (Saudi Arabia), etc.

Peak Oil is not just about gasoline prices rising or the illusion of a hundred million electric cars. Energy depletion means the energy will not be there to use. You cannot burn fuel that does not exist. Endless growth was not possible on a round, finite planet. Brace for impact.

P-090-008 Traffic levels have also peaked as oil prices increased and economic "growth" slowed. It is not a surprise that rising oil prices stopped the rate of traffic growth.

P-090-009 There is still a lot of traffic but the levels are not going up any more. A Supplemental Draft EIS is needed to examine how Peak Traffic will impact the alleged need for expanded highway capacity.



Request for Supplemental Draft EIS - Peak Oil and Peak Traffic - page 3

P-090-007

Please see response to P-090-001.

P-090-008

Please see response to P-090-001.

P-090-009

Peak oil was considered in the DEIS and is not a new issue that has arisen since the DEIS was published. Please see the response to comment P-090-001 above. Also see the responses to P-047, Mr. Joe Cortright's letter regarding fluctuations in traffic volume growth, decline, and forecasts.

Columbia River Crossing
Final Environmental Impact Statement
September 2011
Federal Highway Administration, Oregon and Washington DOT
p. 3-321

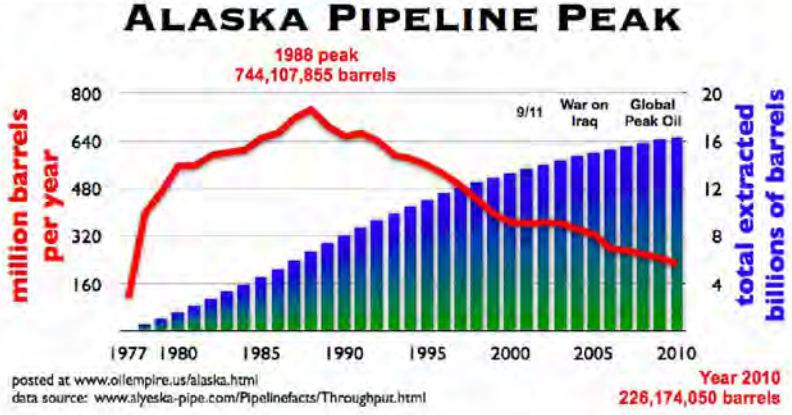
P-090-010

Washington and Oregon Petroleum Supply

"Because gasoline and diesel are the primary energy sources for the transportation sector, this analysis of energy supply focuses on petroleum-based fuel sources. **Approximately 90 percent of Washington's current supply of crude oil comes from Alaska's North Slope oil fields.** Five refineries in the Puget Sound area distribute refined petroleum products to Washington and adjacent states. **Oregon imports 100 percent of its petroleum, approximately 90 percent of it from Washington refineries. Both states' future supply of petroleum is largely dependent on domestic production and reserves. Oil production from the North Slope peaked in 1988 and is projected to continue declining.**"

This ignores the fact that North Slope extraction has dropped by two-thirds and is nearing the "Low Flow" condition where flow will be difficult to maintain in the Arctic winter even though this information is on the Alyeska Pipeline website.

for more information: www.alyeska-pipe.com/Inthenews/LowFlow/LowFlow.html



Request for Supplemental Draft EIS - Peak Oil and Peak Traffic - page 4

P-090-010

Please see response to P-090-001.

P-090-011

Please see response to P-090-001.

P-090-011

EXISTING CONDITIONS AND ENVIRONMENTAL CONSEQUENCES • 3-447
3.19.12 Energy and Peak Oil

The long-term energy demand estimates prepared for the CRC project are influenced by cumulative factors. Those estimates are based on travel demand forecasts that factor in projected regional changes in land use patterns, employment, population growth, and other programmed transportation improvements.
The cumulative energy impact of primary concern is "peak oil." Peak oil refers to the point in time at which the maximum global petroleum production rate is reached, after which the rate of production enters a terminal decline. Peak oil results from many incremental actions, few of which are individually important. However, the potential impact of reaching peak global petroleum production is an important consideration for projects, such as CRC, that are intended to address transportation needs for decades to come.
Oil production in the United States—the world's third largest oil producing nation—reached its peak around 1970 and has been declining since then. **Most estimates place peak global production sometime between 1990 and 2040.**
When oil production drops below oil demand, it is likely to cause petroleum prices to increase. There are uncertainties, however, regarding peak oil's timing and the availability of substitute fuels. Peak oil's effect on transportation fuel prices and travel behavior will depend largely on when peak oil occurs and the availability of substitute fuels.
Peak oil's potential effects on economic activity and travel behavior could affect travel behavior in the region. **The concern is that if substitute fuels are not readily available as petroleum supplies decrease, the rising cost and reduced supply of petroleum could directly reduce auto and truck travel, and could result in dramatic reductions in economic activity, which, among other effects, could further reduce vehicle trips below forecasts.** These vehicle trip forecasts influence the proposed size, design, and financing of transportation facilities.
If fuel prices increase faster than expected, then the number of 2030 highway trips could be lower than forecasted. However, even with relatively substantial fuel price increases, the future demand would still likely be greater than the expanded highway capacity. Because fuel costs represent only a portion of total transportation costs (which include everything from car payments, to insurance and maintenance), even large growth in fuel costs translates to a smaller growth rate in total transportation cost, which more directly affects travel demand in the long term.

Request for Supplemental Draft EIS - Peak Oil and Peak Traffic - page 5

P-090-011 Comment: sharper increases in fuel costs combined with decreased availability of fuel will also have substantial economic impacts that will reduce travel demand. An early version of this shift was demonstrated as oil prices increased as global production peaked. Unemployed people do not drive as much as those who have job security.

P-090-012 Global demand for liquid fuels is projected to grow by 21 percent by 2030, driven in large part by transportation needs (EIA 2010). Petroleum accounts for the largest percentage of liquid fuels globally. Local transportation energy demand is expected to grow as well, although the LPA is projected to reduce future transportation petroleum demand compared to the No-Build Alternative. At the global scale, these fuel savings will be very small, but incrementally more beneficial than the No-Build Alternative.

The LPA includes a number of elements that would reduce adverse impacts related to peak oil. These include:

- The bridge and highway improvements are focused on replacing or updating aging infrastructure, not on building new highway corridors.
- The LPA includes substantial improvements to public transportation, with projected increases in transit mode share in the afternoon peak direction from 8 percent with the No-Build Alternative to 15 percent with light rail transit.
- It provides substantially improved facilities for non-motorized transport (such as walking and bicycling).
- It supports land use planning that seeks to control sprawl, concentrate development, and decrease auto dependency.
- It includes road use pricing (highway tolling).
- Because of the addition of high-capacity transit and the bridge toll, the LPA is projected to have lower daily I-5 river crossings than under the No-Build Alternative.
- It improves highway operations at a key pinch point, which improves fuel efficiency and lowers emissions.
- It increases highway safety, which decreases collisions and congestion, further improving fuel efficiency.

Another concern is the ability of existing transportation infrastructure to adapt to post-peak oil vehicles and technology. Based on current and prototype future alternative fuel vehicles, it is highly likely that the CRC infrastructure (transit guideway, bridges, highway, and bike and pedestrian paths) will be able to accommodate foreseeable changes in vehicle technology and fuels. Electric hybrids, electric plug-ins, and vehicles powered by biodiesel, ethanol, or hydrogen fuel cells

P-090-012

Please see response to P-090-001.

P-090-012

are being designed to operate on modern roads and highways. The light rail transit guideway can be used by vehicles powered by a variety of fuels. The capacity of the proposed bicycle and pedestrian facilities can accommodate substantial growth in non-motorized transportation demand. It is likely that the proposed CRC infrastructure could readily accommodate or adapt to the transition to substitute fuel vehicles, higher than projected growth in non-motorized modes, and higher growth in transit demand.

There is substantial uncertainty regarding the timing of peak oil, the future availability of substitute fuels and technology, and the effects of peak oil on transportation. It is reasonable, however, to conclude that the CRC project can address reasonably foreseeable impacts associated with peak oil, and reduce the project's incremental adverse impact.

Outside the purview of CRC, numerous other measures will influence the timing and impact of peak oil at the global and local scale. These other actions include national and international energy policies, global oil prices, fuel and transportation taxes and fees, alternative fuel and technology research and development, agricultural policy and practices, local land use regulations, and other measures.

Comment: This section needs to be rewritten to acknowledge that oil has already peaked and the economic impacts of reaching the limits to endless growth on a finite planet. Energy creates money, not the other way around. Peak does not mean that we have run out, but it does mean that growth is over. Energy decline is not just about rising oil prices, it is about a reduction in the available supply. The level of demand that the public has for liquid fuels cannot make those fuels come into existence. There are physical limits to energy supplies that are not subject to economics or psychology. Yes, higher prices spur energy companies to extract lower quality, more expensive, more difficult to extract supplies -- and to look at alternatives to fossil fuels. But these mitigation approaches on the downslope are unlikely to offset the decline in the energy supplies that keep our transportation levels constantly increasing.

P-090-013

What does the U.S. Department of Energy say about peak oil?

A report by the U.S. Department of Energy (Hirsch et al. 2005) included the following conclusions:

- World oil peaking is going to happen, and will likely be abrupt.
- The problem is the demand for liquid fuels (growth in demand mainly from the transportation sector).

P-090-013

Please see response to P-090-001.

P-090-013

- Mitigation efforts will require substantial time.
- Both supply and demand will require attention.
- More information is needed to more precisely determine the peak time frame.

Comment: The Hirsch report concluded twenty years of preparation would be needed to prevent the economic crash from Peak Oil, even if toxic practices such as coal to liquids, tar sands and other noxious sources were extracted. Hirsch concluded that we would have a severe economic shock if we waited until the Peak to start making shifts. Ignoring this conclusion of the report invalidates the EIS and requires a Supplemental Draft EIS to examine the probable scenarios regarding travel demand and economic stability in the CRC's design year.

P-090-014

Has transportation infrastructure been able to adapt to change?
Transportation infrastructure has proven to be relatively adaptable. For example, the northbound I-5 bridge over the Columbia River was built in 1917 as a two- lane bridge that originally carried electric trolley cars and Model T autos (which ran on either gasoline or ethanol). While the bridge is now out-of-date in terms of seismic safety and traffic safety design standards, the bridge has accommodated nearly a century of changes in transportation technology, energy policy and prices, vehicle types, and travel behavior.

Comment: There never before has been a permanent plateau on energy availability. Reaching the limits to growth in energy needs to be examined in a Supplemental Draft EIS. Solar energy and biofuels are great but they are unlikely to be able to completely replace our current consumption.

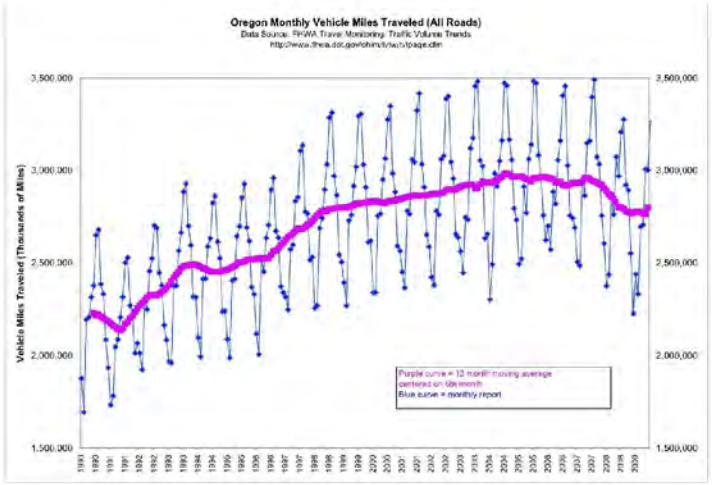
"The government cannot print oil."
-- Robert Hirsch, ASPO USA 2009 conference, October 13, 2009

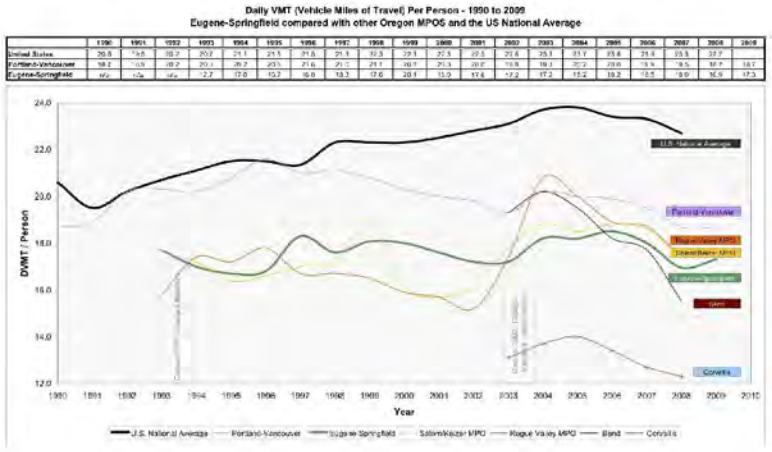
"The economists all think that if you show up at the cashier's cage with enough currency, God will put more oil in the ground."
-- Kenneth Deffeyes, petroleum geologist and associate of M. King Hubbert

P-090-014

Please see the responses to Mr. Robinowitz's above comments, and the discussion of peak oil and energy in Section 3.19, Cumulative Impacts, of the FEIS.

P-090-015

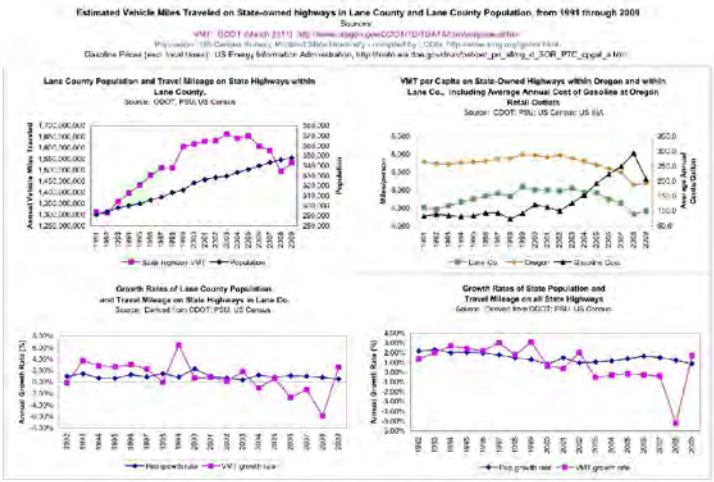




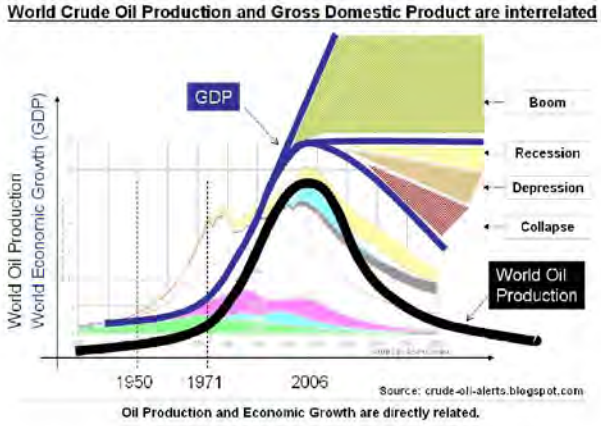
P-090-015

Please see response to P-090-001.

P-090-015



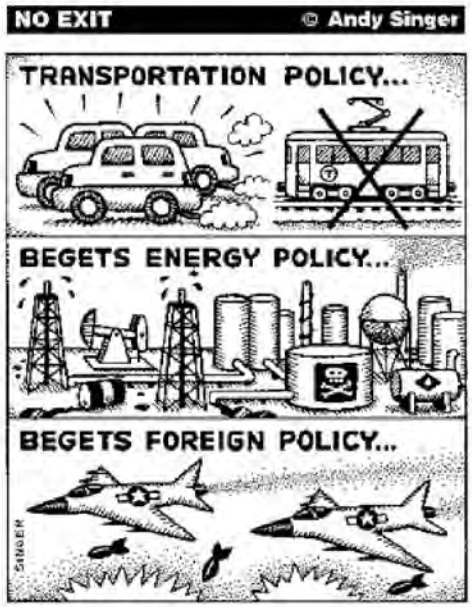
graphics from the Lane Council of Government



Oil Production and Economic Growth are directly related.

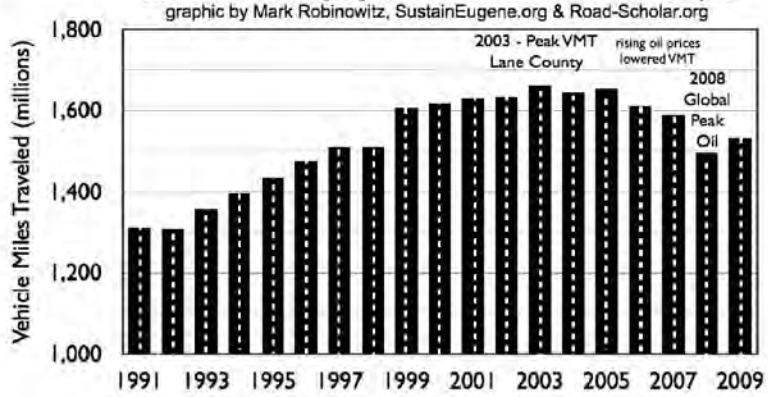
Request for Supplemental Draft EIS - Peak Oil and Peak Traffic - page 10

P-090-015



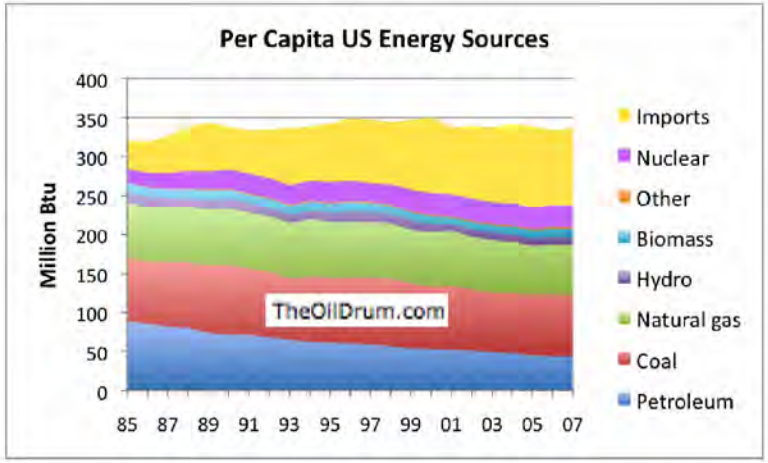
Lane County VMT - Oregon State Highways

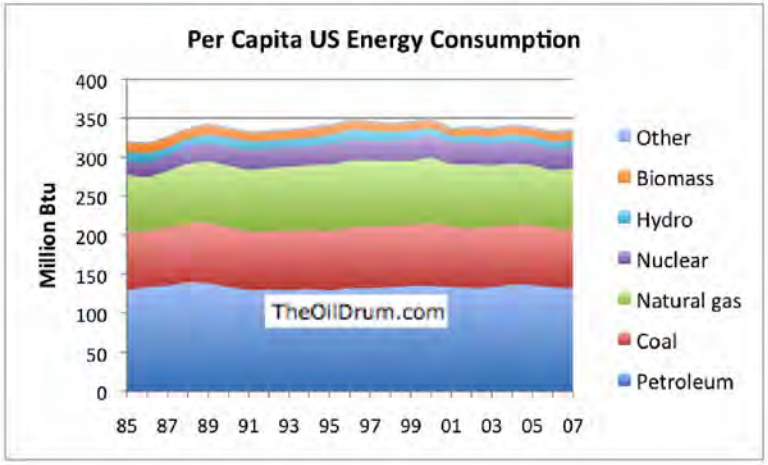
data source: www.oregon.gov/ODOT/TD/TDATA/tsm/docs/VMTCounty.xls
graphic by Mark Robinowitz, SustainEugene.org & Road-Scholar.org



Request for Supplemental Draft EIS - Peak Oil and Peak Traffic - page 11

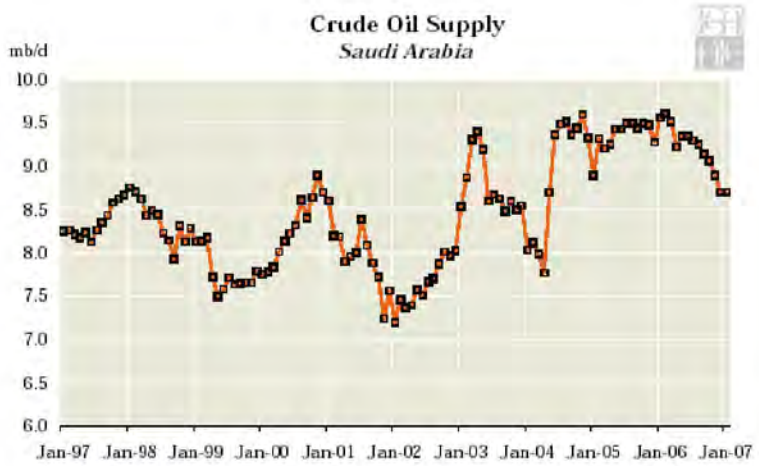
P-090-015

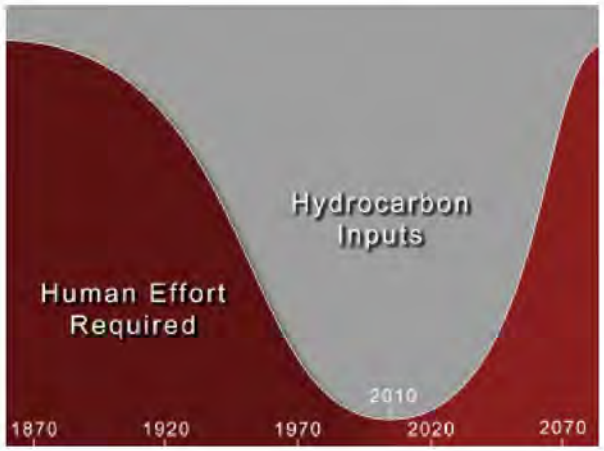




Request for Supplemental Draft EIS - Peak Oil and Peak Traffic - page 12

P-090-015



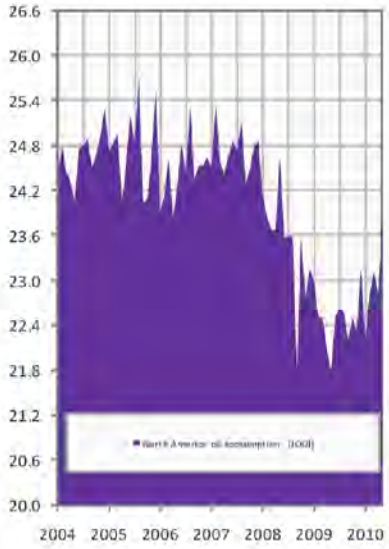


Request for Supplemental Draft EIS - Peak Oil and Peak Traffic - page 13

P-090-015

North America oil consumption
Oil consumption in North America increased by 1.0 million b/d from April to May 2010. Resulting in a consumption level of 23.84 million b/d. Average oil consumption in North America in 2009 was 22.51 million b/d, versus 23.50 and 24.72 million b/d in respectively 2008 and 2007.

Chart 21: North America Oil Consumption Jan. 2004 - May 2010



Source: Joint Oil Data Initiative

graphic showing North American oil consumption dropping after global Peak Oil -- we cannot burn fuel that does not exist whether it is cheap, expensive or rationed -- from www.peakoil.nl

P-090-015

graphics from Energy Watch Group, Germany
US production is long past peak and the future of US oil is low grade shale, offshore drilling and Canadian tar sands.

Figure 29: Oil production in the USA

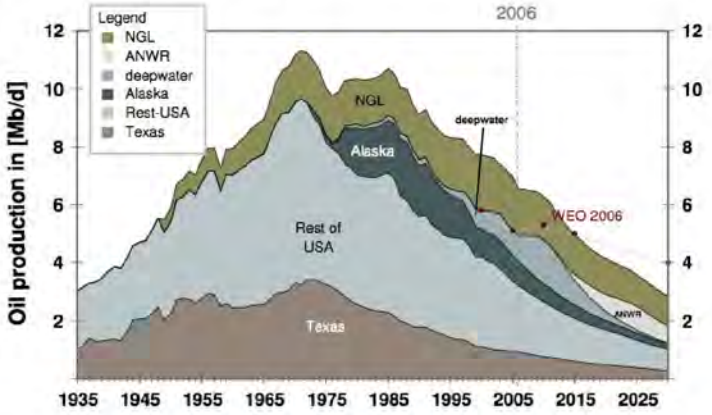
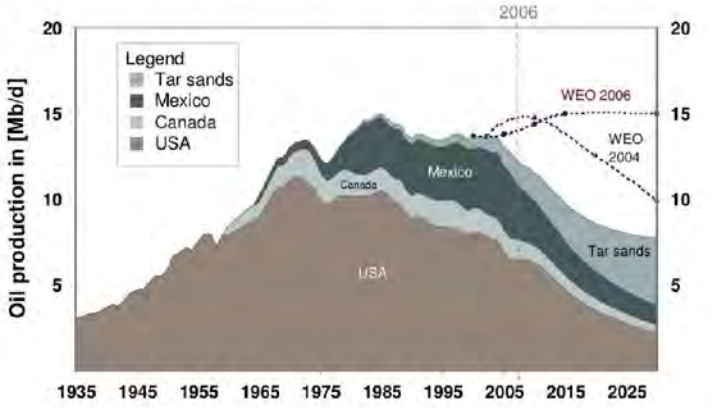


Figure 28: Oil production in OECD North America



Request for Supplemental Draft EIS - Peak Oil and Peak Traffic - page 15

P-090-015

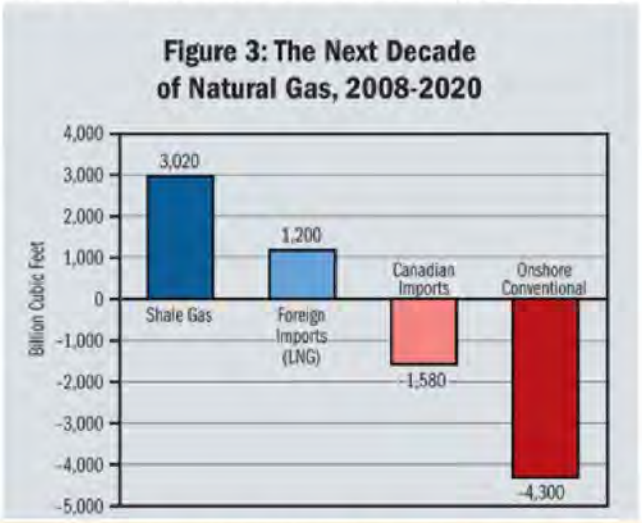
graphic from British Petroleum

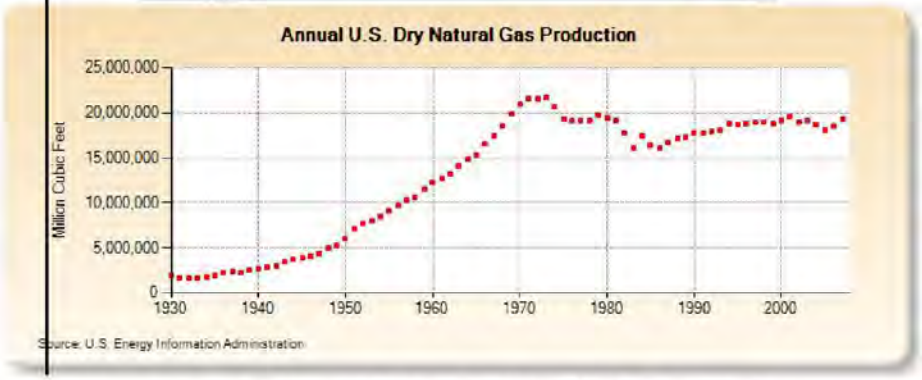


Note that Cascadia does not have ANY oil, we have the wrong geology.
Volcanic basalt and subduction zones are not where petroleum traps are created.
There is a small amount of natural gas in Oregon.

P-090-015

graphic from US Department of Energy
the decline of Natural Gas will have significant impact on economics, including electricity production (since there has been a lot of new power generation in the past two decades running on natural gas). Shale gas "fracking" is a short term resource that is unlikely to last as long as its promoters claim.
for details read geologist Art Berman's reports at www.aspousa.org and reports on natural gas at Post Carbon Institute www.postcarbon.org





Request for Supplemental Draft EIS - Peak Oil and Peak Traffic - page 17

P-090-015

from the Association for the Study of Peak Oil and Gas - USA
August 24, 2009
www.aspo-usa.org

Commentary: Interview with Tom Whipple

Tom Whipple, retired CIA analyst and editor of this newsletter, will be a speaker at the ASPO-USA conference this October 11-13. When called up and ambushed for this interview, he immediately said he thought the idea qualified as "the dumbest idea of the week," but eventually assented. From his home just outside Washington D.C. in Virginia, the amount of information that Tom single-handedly has gathered and circulated about the unfolding peak oil story is extraordinary. For his relentless efforts, ASPO-USA has named their award for volunteer of the year the Whipple Award.

***Question** (from Steve Andrews): when did you first become aware of the peak oil phenomenon?*

Tom Whipple: I think it was the 1998 article in *Scientific American*, by Colin Campbell and Jean Laherrere ["The End of Cheap Oil"]. This was the first time I became aware that this was serious. Prior to that, I had read a little about this in *The Limits to Growth* [1972], but that disappeared for about 25 years. Then, not much happened until 2004, when everything started moving rapidly: prices started flying up, the peak oil movement started ramping up, Peakoil.com and The Oil Drum started right about then. So I started to follow the information flow.

***Question:** When did you start writing about the peak oil story?*

Whipple: The first thing I got involved with was writing a few columns for a local newspaper, the *Falls Church News Press*. For years the editor had asked me to submit some material. I finally asked him if he would publish something on peak oil. Just that week, a big story on peak oil had been in Rolling Stone, a review of *The Long Emergency* by Jim Kunstler, and the editor was quite taken by it, so he said "go ahead." That was in early 2005, and I've been writing a column a week ever since; with just a couple of breaks, I must be up over 225 by now. I've been exploring a wide range of topics related to peak oil—not so much the geology, but what some of the implications are and how we're going to get through this. Every week something new pops up. This week came the announcement that the world's oil can be replaced by growing something akin to algae; whether this can pay off or not I haven't a clue, but it shows that there are a lot of people out there working on a bunch of technologies.

***Question:** When did you start assembling The Daily Countdown? [This was the precursor to the present Peak Oil News, the daily that Tom has assembled for ASPO-USA since Feb. 2006.]*

Whipple: First, I started doing the Virginia News when the major newspapers went on the internet back in 1996. My only claim to fame is that I was the first guy to recognize that it's not too difficult to go through the 25 or 30 of the major Virginia papers every morning, pick out the important stories and send them out in a newsletter. Today I've got about 2500 people reading it, including lots of editors and reporters, and it's just all by word of mouth. So when the peak oil movement came along about seven or eight years later, I had the software and processes worked out to create the same thing there; going from critical stories around the state to global stories about energy wasn't actually that much of a shift when I started it in early 2005.

***Question:** Did anything in particular trigger your start of the Daily Countdown publication?*

Whipple: I think I noted early on in The Oil Drum or another site when someone posed the question "what can we *do* about peak oil?" And someone wrote back, "*tell* people about it." Then I thought, "oh I know how to do *that*," so I immediately designed my own little peak oil newsletter. Soon afterwards I checked with 50 or 60 leading newspaper reporters and editors who were reading my Virginia News. I wrote that I was starting a new newsletter about peak oil and asked if any of them would be interested in reading this new publication that was free, just like the Virginia News. The

P-090-015

response to that query was exactly zero. Not a single reporter or editor seemed to care about peak oil. Yet when I missed my first mail-out of the Virginia News a couple of weeks ago—for technical reasons—the reporters went absolutely berserk.
By the time of the first ASPO-USA conference, I had about 100 subscribers for the Daily Countdown. After the conference you asked me what could we do in terms of a publication. I said this could make a good foundation for a weekly publication; we just sift through the material we collected during the week, find the most important stories, and highlight those in the weekly.

Question: *Give us a little of your background at the CIA that helps these information searches.*

Whipple: I did a whole variety of things there. I drafted National Estimates for a while. I was an analyst for a while, working on individual countries. I didn't have anything to do with oil up there. I spent a lot of time working on current intelligence, which was basically the daily publications.

Question: *What about your involvement with the presidential briefing papers?*

Whipple: There was a publication prepared every day called the President's Daily Brief. One of my jobs for years was to babysit the Brief over night; it was prepared during the day, but not printed until 5 a.m. What looked black at 5 p.m. in the evening might look white by 4 a.m.—an army that we thought, in the evening, wouldn't cross a border might have done exactly that during the night. So I had a lot of experience sifting through a vast flow of information from around the world. Following the peak oil story is very similar to what intelligence officers do. But 30 or 40 years ago, when I started doing this, you couldn't access this information you needed on a computer in your basement. You had to be in a government office with banks of teletypes clacking away and reports coming in from a dozen wire services and 100 embassies around the world. After sifting through a flood of information for years, you get a feel how to go through it quickly and how to spot what's important for policy makers.
To a certain extent, that's what some of us are doing in the peak oil realm, but now we can get information from the internet—there's so much out there. Before the internet, if magazines and newspapers didn't want to pick something up, you never heard about it. That's why the peak oil story has been an internet phenomenon: there is absolutely minimal information on it in the newspapers, in part because it's controversial. And there are many that think there will be technology that will overcome the problem. Many of us who follow the peak oil story don't think so; we think that oil depletion is going to overcome technology and new investment in the near future

Question: *So you don't think technology will be the cavalry riding over the peak oil hill?*

Whipple: In the peak oil realm, you have the doomer side and techno-fix side. The doomers tend to think peak oil is going to tear society apart. The techno-fix group thinks there is going to be something that comes along that helps smooth us into the post-fossil-fuel world, though they're not sure what it will be. I'm somewhat in the middle. On the technical side, there are a lot of things that can be done, no question about it. All of the energy we use comes from or came from the sun—or geothermal, or the Big Bang way back—so we just have to find the smartest ways to convert it and put it to use. We have to get by with a lot less energy—we can cut consumption by about a third without any real hardship…it's the main thing we can do in the near term without spending too much money. Then we get around to collecting energy in other ways, shapes and forms. So that's where I am personally on peak oil right now.

Question: *What do you anticipate will be the future for the airline and trucking industries?*

Whipple: I think they are going to have a lot of trouble. They almost went under last summer. The energy price crashes last fall helped these industries keep bumping along, but airline seats are down around 13 percent. I think we're looking at more of the same. Right now I'm looking into the relationship between much too much credit, for these and other groups, and peak oil. I just don't see how we can get out of this recession in any recognizable form. The minute you have a small recovery, oil prices will shoot up and we'll have the same problems again.

Question: *What will it take to wake people up? Just responding to more high prices?*

P-090-015

Whipple: I don't think anything else can do it but high gasoline prices. When they are back up at $4 a gallon, we'll start paying attention again, but prices will eventually grow from there, which will mean people will have to start cutting back, with continued painful economic consequences.

Question: *You've briefed a lot of elected officials about peak oil. How have they responded?*

Whipple: I've talked with the governor, one of our senators, a number of congressmen, a number of state-level officials, and other officials over the years. It's the same story; most people believe what I'm saying but they really have trouble internalizing the significance of all this. Everyone asks, "what are our alternatives?" They've heard of ethanol and coal to liquids and electric cars and other potential solutions, but they haven't heard that these technologies cannot happen quickly. Oil production will likely drop a lot faster than the economy's ability to invest in and bring on alternatives. It would take 25 years to replace the fleet with plug-in hybrids, etc., if we could afford to do it, given the shape of the economy over that time frame. More people are starting to understand this, but they don't quite get that it's going to happen soon.

Wrap: *Tom, thanks for your time.*



as we move beyond the age of oil and beyond the economy that is driven by the age of oil, we enter an entirely new world - there really are frankly no experts anywhere who can come forward and say exactly what we do in this situation - it is entirely new to everybody's experience - there are no investors who can say this is a good investment in this situation, there are no politicians who can say this is how we should behave in this situation, even in a humble business way there is no business that can plan its future because every single aspect of its future is going to change and so we are left with a sort of vacuum
-- Colin Campbell, founder of the Association for the Study of Peak Oil www.peakoil.net
quoted in "Peak Oil: Imposed by Nature"

P-090-015 http://www.postcarbon.org/blog-post/165463-alaska-and-energy

Alaska and Energy
Posted Oct 26, 2010 by Richard Heinberg



During my recent visit to Anchorage, Alaska to speak at that city's Bioneers satellite conference, the friendly locals seemed eager to educate me about their local energy issues. Some of what I learned struck me as important to share with a wider audience.

Alaska is, of course, a huge energy exporter. Crude from the North Slope saved America's energy bacon back in the '80s, helping to lower world oil prices and bankrupt the evil Soviet empire. **Production there has declined from a peak of over two million barrels per day to only 600,000 or so today. Once the flow drops below 500,000 barrels, there will be problems with icing in the Trans-Alaska Pipeline system.** Not good.

The state's economy is based almost entirely on resource extraction. Everyone gets a check annually from the Alaska Permanent Fund, set up in 1976 primarily by the efforts of then Governor Jay Hammond. High oil prices mean big dividends: in 2008-2009 extra-large payouts made Governor Palin look good to her constituents, though she was in no way responsible.

Alaska has enormous opportunities for renewables—wind, microhydro, geothermal, tidal, even solar. But these are far from being adequately developed, and progress in that direction will take time and lots of investment—a dramatically higher pace of investment than is currently evident.

Anchorage (by far the largest city in the state) faces a particular challenge with natural gas: currently nearly all houses are heated with gas, but supplies from Cook Inlet will run low in two years, even sooner with an abnormally cold winter. Most options to replace current sources (more drilling, LNG, alternative energy) will take longer than two years to develop.There is no serious planning for what to do about this.

P-090-015

Then there is the situation of the native villages. On one hand, the indigenous peoples of the north might seem well placed to weather the changes ahead as industrial society succumbs to peak oil, peak coal, and peak gas: they have cultural traditions of self-sufficiency, small populations relative to land area, and access to lots of wild protein on the hoof (moose, caribou). However, as James van Lanen of Alaska Department of Fish and Game wrote to me in an email just the other day:

"Alaska Native villages are in a very precarious situation. These remote villages are only accessible by motorized travel via air or watercraft. They are entirely dependent upon fossil-fuel systems for goods and services: food, heat, health care. They have no contact with the outside world without fossil fuels.

"Some villages obtain more of their food resources from wild sources than others. It would be safe to say that on average 80% of the protein consumption in a village is from wild sources. Berries and Plants supplement some part of the overall diet but this is small. The two important things to consider are (1) much of the food consumed comes from industrial sources and is shipped in via small aircraft and (2) wild food harvests are currently almost entirely fossil-fuel dependent (there is a well-embedded 'machine culture' in native villages; I believe that there is no extant ability to obtain significant amounts of wild foods without the use of machines)..."

"Peak Energy will hit Alaska villages sooner and more intensely than many other places. Fuel is already up to $9 per gallon in some places. As it becomes uneconomical for current supply operations to continue the industrial resources these villages rely on will fizzle out."

"Most village people are aware of their complete dependence upon fossil fuels. Many elders foresee a future collapse due to increasing costs and modern dependence. However, there is no general awareness of the phenomenon of Peak Energy in these communities. There is no awareness that the entire system may break down. Alaska villages desperately need to become educated in what we are facing."

I came away from my too-brief sojourn in Anchorage with both a deep appreciation for this land of great natural beauty, contrasts, and extremes, and an equally deep concern for how Alaskans will deal with their enormous energy challenges. Some of those challenges are going to present themselves forcibly in the very near future.

P-090-015

http://dieoff.com/page133.htm

This Paper is Issue #3 in a Series of Studies
Based on the World Oil Forecasting Program
(A PDF Version of this paper is available at http://www.dieoff.com/page133.pdf)

THE WORLD PETROLEUM LIFE-CYCLE

Richard C. Duncan[1] and Walter Youngquist[2]

Presented at the PTTC Workshop "OPEC Oil Pricing and Independent Oil Producers"
Petroleum Technology Transfer Council
Petroleum Engineering Program
University of Southern California
Los Angeles, California
October 22, 1998

Abstract

The world oil production peak, we assume, will be a turning point in human history. Our goal is to predict the world peak. To accomplish this goal, we have developed (to our knowledge) a unique new procedure based on oil production data, data analysis, conventional formulas, and heuristic knowledge. It comprises (1) a program, and (2) a method.

The program uses the historic oil production data and predicts by statistical and heuristic techniques future production for the world's 42 top oil-producing nations (each modeled separately), grouped into 7 regions, and the world. The method is to build up a series of forecasts which, taken together, will inevitably converge on the peak. This paper presents the third in this series of forecasts -- designated 'Issue #3.'

The peak production year and the expected ultimate recovery for each nation, seven regions, and the world are given in Table 1. Figure 1 graphs the world oil production life-cycle with the peak in 2006. Table 2 gives similar information for each region. Figures 2-8 graph the life-cycle for each region with peaks from 1985 for North America to 2011 for the Middle East.

Middle East & non-Middle East and OPEC & non-OPEC categories are compared in Table 3. Figure 9 graphs the Middle East & non-Middle East. Figure 10 graphs OPEC & non-OPEC.

Figures 11 and 12 depict by simulation whether or not new oil discoveries can delay the world peak. If so, by how much? Figure 13 is a 'phase diagram' that maps, as it were, our crooked route to the world oil summit. All tables and figures are discussed in the text.

We believe that a 'base-camp' and a series of higher camps must be established before finally ascending to the summit. 'Encircling' we call it, as illustrated by the three forecasts we've made so far. Specifically, the 1996 Issue #1 put the peak in 2005; Issue #2 put it in 2007; Issue #3 (this paper) put the peak in 2006. Of course the peak could occur before 2005 or after 2007. Perhaps 10 camps will be required. Maybe more.

En route to the summit, four predictions that we have made have since proved consistent with trends and events: Asian economic crisis, non-OPEC peak year, world peak inertia, and Caspian dry holes.

All the models are available free on the Internet at http://www.halcyon.com/duncanrc/

Looking ahead: The new forecasting method, we believe, can successfully predict the production life-cycle of any of the fossil fuels, including oil, gas, and coal.

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P-090-016

Comments on the Draft Environmental Impact Statement Columbia River Crossing Portland, Oregon & Vancouver, Washington

by Mark Robinowitz, www.road-scholar.org
Box 51222 - Eugene, Oregon 97405 - mark@permatopia.com
July 1, 2008

Summary: Peak Oil and Peak Traffic Alternative 2
Troubled Bridges Over Water: Transportation Triage 3
Peak Traffic: The Achilles Heel of Highway Expansion Plans 5
Vehicle Miles Traveled (VMT) has Peaked 7
SDEIS needed to address "new circumstance" of Peak Oil & Peak Traffic 9
- Council on Environmental Quality regulations implementing NEPA 9
- Federal Highway Administration regulations about NEPA 9

The End of the Age of Oil: growth is over 9
- why alternative fuels and efficient cars won't make much difference 10

DEIS mention of Peak Oil is inaccurate 11
2030 design year is past peak 12
- Peak Oil causing Peak Traffic 15
- Peak Asphalt 17

Climate greenwash: a quiz 17
Saving Oil in a Hurry: carpooling is part of the answer 19
NAFTA Superhighway - ISTEA, TEA-21, SAFETEA-LU 20
- Corridors of the Future program includes CRC and upgrading I-5 in California 22
- Washington Commerce Corridor 26

Tolling without tollbooths: the J. Edgar Hoover Memorial Bridge 28
Coalition for a Livable Future "Climate Smart" Alternative 28
Reviving the Rails: a best case Peak Oil scenario 30
Rebuttal of DEIS energy sections 36
Peak Asphalt 51
Spy Roads: Civil Liberties vs. Transportation Surveillance 52
- Geoslavery: GPS and technological tyranny 60

Attachments 78

P-090-016

Please see response to P-090-001.

P-090-016

Summary: Peak Oil and Peak Traffic Alternative

I support light rail transit across the river into Vancouver.

I support expanding this project to include Amtrak and freight rail, including consideration of existing plans for high speed passenger rail between Eugene and Vancouver, B.C.

I support improved bus public transit to connect people to the rail stations.

I support paying for the transit systems by redirecting highway funds and increasing gas taxes (the original light rail line to Gresham was paid for with money appropriated for the Mount Hood Freeway). Rebates need to be considered to mitigate these impacts on lower income people. There is no technical reason why public transit should not be free.

I do not support a wider, 12 lane bridge.

I do not support a surveillance system on the existing bridge (or on a new bridge) to keep track of everyone's travels through RFID, Automatic License Plate Recognition and / or GPS enabled "mileage tax" tracking systems.

I do not support adding "collector - distributor" lanes on I-5 on either side of the river or on any replacement bridge, if one is built to replace seismically unsafe structures.

I do not support traffic analyses that assume substantial rises in travel demand even though we have reached Peak Oil and Peak Traffic.

A supplemental draft environmental impact statement (SDEIS) is needed to factor in Peak Oil and peak traffic, which invalidate the traffic growth projections used for this project.

Before the rubber stamps are used, the FHWA, ODOT, WSDOT and local governments must consider that **the National Environmental Policy Act states that if there are "new circumstances" that impact a project, then they need to be factored in to the analysis. The fact that we have reached the end of cheap oil (peak oil) and the start of climate change needs to be factored into the long term "needs" analysis of the big bridge.**

The design year for this highway expansion is 2030 -- long after Peak Oil. Therefore, the traffic needs analysis needs to be changed to reflect the fact that there will be much less fossil fuel available for personal transportation on the downslope of "Hubbert's Curve."

ODOT / FHWA are planning to widen I-5 despite the lack of demonstrated need. The project is designed for twenty years in the future, not current travel demands, yet "peak traffic" has already happened and we are now at Peak Oil. Future increases in gas prices and decreases in gas availability will drop total vehicle miles traveled (the only question is how quickly). Therefore, there is no need to widen I-5 and no need to spend more money on a widened bridge and road.

If the existing bridges cannot be upgraded for seismic safety, then a replacement, permanent bridge should be built to the same number of lanes as the road on either side of the bridge -- three

P-090-016 lanes in each direction. This would save money that could be used toward fixing or replacing other damaged bridges such as the crumbling Sellwood bridge.

If the DOTs ignore geological (and financial) realities, then it would be best to save our money by dispensing with the pretense of public input and let the DOTs do anything that it wants without the illusion of oversight. As the lawyer said to the oil man in the film SYRIANA, "we are looking for the illusion of due diligence."

Troubled Bridges Over Water: Transportation Triage

"Another flaw in the human character is that everyone wants to build but nobody wants to do maintenance"

-- Kurt Vonnegut

The notorious collapse of the I-35W bridge in Minneapolis in 2007 points out the dangers of deferring maintenance in favor of building more and more roads -- a change in priorities is long overdue.

P-090-016



Oregon's highway network is riddled with aging bridges that no longer can support existing traffic flows because their structures are wearing out. As we shift from an era of cheap energy and abundant economics toward the era of expensive energy and conservation, it will become more difficult to repair or replace cracked bridges. **Spending billions to widen I-5 when there is a huge backlog of damaged bridges is dangerously neglectful of the need to keep the existing network functional.**

One ODOT planner told me a few months ago that the Department's priority was to keep I-5, I-84, Route 20 and Route 97 intact, and that other routes were not as much of a priority. **A better approach to "transportation triage" would be to focus on maintaining the existing**

4

P-090-016

system before even planning to make expansions to capacity, even without considering the issues of Peak Traffic.

Oregon still allows heavier trucks on its roads than California or Washington permit. Shifting some of this freight traffic to railroads would reduce energy consumption and protect our highway bridges. This change needs to be seriously factored in to the SDEIS for the Columbia River Crossing.

We can choose as a society to either expand the highway system some more (NAFTA Superhighways, more Outer Beltways and bypasses, etc) or focus on making sure that the existing network can be maintained after Peak Oil. Unfortunately, few politicians highlight the need to make AMTRAK a serious transportation system for efficiently moving people. A national priority for quality train service would create a lot of good jobs, reduce energy consumption, and make it more likely that the United States will be able to mitigate the inevitable impacts of the end of the petroleum era. Proposals for the 80 new "corridors" in the SAFETEA-LU highway expansion law are a preventable trillion dollar misallocation of resources.

It is likely that about $1 trillion has already been spent to destroy the nation of Iraq (if preparations for the conflict are included), home to the planet's second largest oil reserves. This is more than half of the cost that has been estimated for rebuilding the tens of thousands of deficient highway bridges that are aging and becoming dangerous.

There are several serious - but languishing - proposals for high speed rail in the United States that would be similar to European and Asian networks. Building all of them would probably cost less than the money spent on the War on Iraq.

P-090-017

Peak Traffic:
The Achilles Heel of Highway Expansion Plans

As the world passes the peak of global petroleum production, gasoline prices are likely to increase to the point that traffic demands on roads will be reduced. While it is impossible to accurately predict the price of fossil fuels in the design year of 2030, it will be surprising if gasoline is not rationed on the downslope of the Peak Oil curve (either directly by ration cards or indirectly by pricing it out of reach of many who currently consume it). While so-called alternative fuels exist and there are vehicle designs much more efficient that current models, they are only going to be able to mitigate the energy downslope. Carpooling is going to be more important than hybrids.

US federal transportation law requires that new federal-aid highway projects consider the traffic demand twenty years in the future. In the 1991 ISTEA law, a provision was added to federal highway approvals that requires all highway plans in a metropolitan area to fit into a regional long range transportation budget to avoid a form of fiscal segmentation. If a metro area wants lots of new roads, they have to show how the projects could be paid for (federal and local funds) over a 20 year period. Approving a project that lacks funding is therefore a form of segmentation. The funds need not be available when construction begins, but the entire project has to fit within a constrained transportation budget - a process similar to buying a home with a mortgage (a home buyer has to show their potential ability to raise all of the funds over the span of the loan).

P-090-017

Please see response to P-090-001.

P-090-017

While no one, not even Dick Cheney, knows precisely what will happen with Peak Oil, to ignore it completely and make more "growth" projections and traffic models that assume constant supplies and pricing of petroleum is delusional. **When FHWA finally requires energy analyses in NEPA documentation, they could examine a range of scenarios: gasoline at $10 per gallon in 2030, gasoline at $100 per gallon in 2030, and gasoline not available to the public in 2030 (only to elites and the military)**

As the world passes the peak of global petroleum production, gasoline prices are likely to increase to the point that traffic demands on roads will be reduced. While it is impossible to accurately predict the price of fossil fuels five, ten, or twenty years in the future, it will be surprising if gasoline is not rationed on the downslope of the Peak Oil curve (either directly by ration cards or indirectly by pricing it out of reach of many who currently consume it). US federal transportation law requires that new federal-aid highway projects consider the traffic demand twenty years in the future -- so the reality of Peak Oil and climate change means that the continent wide rush to build more bypasses, wider bridges, Outer Beltways and NAFTA Superhighways will not be needed. As of July 1, 2008, there are no road projects known to this writer anywhere in North America that have been scaled back or canceled because of Peak Oil and Peak Traffic.

The website **www.road-scholar.org** suggests some political and legal strategies to prevent this trillion dollar misallocation of resources so that real solutions can be implemented:

- repair or replace worn out bridges (but not with wider bridges) while we still have oil
- invest in public transit & Amtrak
- get ready to travel less
- grow food in the cities (community gardens) and suburbia (food not lawns) to reduce oil dependence of industrial agriculture

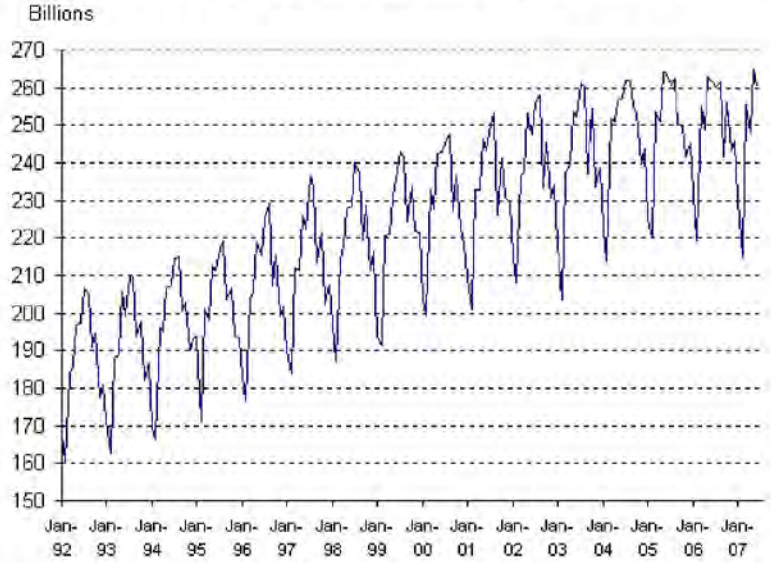
Euan Mearns on June 11, 2008 - 4:42pm
Its really hard to come to terms with the number of corporations, government agencies, consultancies, civil service departments and politicians who seem incapable of comprehending a trend break or trend reversal. Collectively they would have been incapable of working out that the wheel may change transport.
http://europe.theoildrum.com/node/4130#comment-359871

P-090-017

Vehicle Miles Traveled (VMT) has Peaked

Three dollar a gallon gasoline caused the constant increase in traffic to stop, four dollars a gallon gasoline has precipitated an overall decline in traffic levels.

US Department of Transportation Bureau of Transportation Statistics

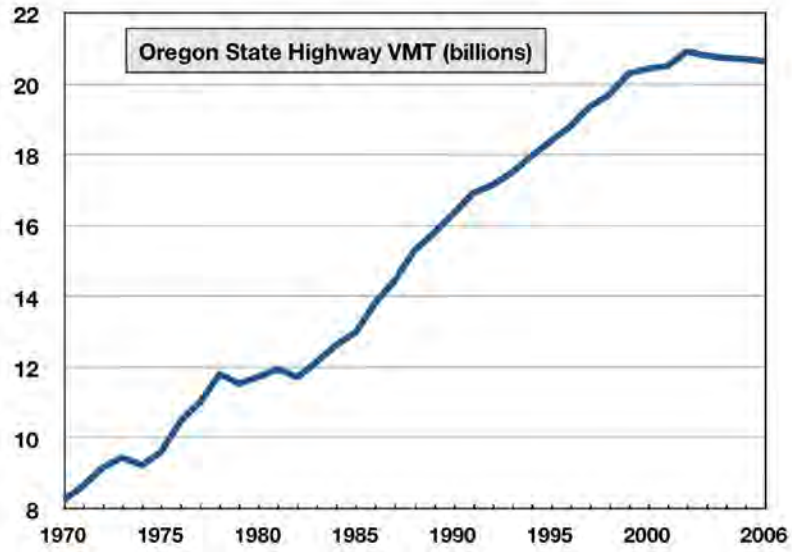


www.bts.gov/publications/white_house_economic_statistics_briefing_room/ august_2007/ html/highway_vehicle_miles_traveled.html

national VMTs peaked about two years ago
traffic levels vary through the year
(there is more driving in the summer than the winter)

7

P-090-017



Oregon state highway VMT data from
www.oregon.gov/ODOT/TD/TDATA/tsm/vmtpage.shtml

1973: dip due to Saudi oil embargo
1979: dip due to gas lines after Iranian revolution
2002: peak traffic on Oregon highways

This chart from ODOT shows that traffic levels on Oregon State Highways peaked about four years ago, and is on a plateau, mostly because of the increasing price of oil. The US Dept of Transportation Bureau of Transportation Statistics shows that national Vehicle Miles Traveled peaked in 2005. In May 2008, the Federal Highway Administration stated that March 2008 was the sharpest decline of traffic recorded since they started keeping detailed records - it was 4.3 % less than March 2007. We are on a plateau of traffic that will last as long as oil remains relatively affordable.

The current dip in VMT is not temporary,
it is more like climate change, a permanent shift in the way things work.

8

P-090-018

SDEIS needed to address "new circumstance" of Peak Oil & Peak Traffic

NEPA mandates that a "Supplemental" EIS must be prepared if there are "new circumstances" not anticipated when the scoping process was conducted. Surely reaching the peak of petroleum production worldwide is an important circumstance for a transportation project allegedly designed for travel long past the peak of petroleum.

If FHWA included Peak Oil into environmental analyses for highway projects, this could create a seismic shift in transportation planning across the United States, allowing for honest public discussion about energy and transportation policies. There are several ways this shift could happen: a successful Federal lawsuit forces FHWA to include Peak Oil, the start of gasoline rationing makes transportation planners consider alternatives, or a change in national policies (probably the least likely in the near future).

Council on Environmental Quality regulations implementing NEPA

40 CFR 1502.9: Draft, final and supplemental statements.
(c) Agencies:
(1) Shall prepare supplements to either draft or final environmental impact statements if:
(i) The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or
(ii) There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

Federal Highway Administration regulations about NEPA

23 CFR § 771.130 Supplemental environmental impact statements.
(a) A draft EIS, final EIS, or supplemental EIS may be supplemented at any time. An EIS shall be supplemented whenever the Administration determines that:
(1) Changes to the proposed action would result in significant environmental impacts that were not evaluated in the EIS; or
(2) New information or circumstances relevant to environmental concerns and bearings on the proposed action or its impacts would result in significant environmental impacts not evaluated in the EIS.

P-090-019

The End of the Age of Oil: growth is over

Peak Oil does not mean that civilization is about to run out of oil. Instead, we are near (or at) the point where continued growth of petroleum combustion no longer can be maintained, which will have profound consequences for the global economy that is dependent on exponential growth of nearly everything (especially of money supplies). Energy creates the economy, a physical limitation rarely acknowledged by economists. Peak Oil is also the point where the maximum amount of economic "growth" is reached -- and ideally a turning point where we can decide to use the remaining half of the oil as a bridge toward a more sustainable way of living. It

P-090-018

Please see the responses to Mr. Robinowitz's comments above.

P-090-019

Please see response to P-090-001.

P-090-019 would require enormous energy, money and people power to reorient away from NAFTA Superhighways toward investing in bullet trains, away from dirty fossil fuel technologies toward efficiency and renewable energy systems, away from resource wars and toward global cooperative efforts to reduce our collective impact on the planetary biosphere.

why alternative fuels and efficient cars won't make much difference

Renewable energy systems are largely focused on generating electricity. Transportation systems in the CRC area are almost entirely based on burning liquid fuels, which are not generated by solar PV power or wind turbines.

A bigger problem is that by the design year of 2030, natural gas supplies from the western US and Alberta are likely to have dropped so low that they will no longer be able to be used to generate electricity -- the remaining gas will be needed to heat buildings, especially in the colder climates where the gas is extracted from. Whatever renewable energy systems are installed between now and then will need to replace the substantial inputs that natural gas has for the western electric power grid at the same time that there is less available energy to manufacture solar panels and wind turbines.

All of the major car companies have developed much more efficient vehicles (Greenpeace, "The Environmental Impact of the Car," 1992), with many models around 100 mpg. VW even has a small model that is highway rated that gets about 250 mpg -- the VW CEO drove it to their annual stockholder meeting a few years ago. While technological shifts may help mitigate the energy crisis after Peak Oil, it cannot eliminate the problem. There are no factories to make these vehicles. There are no capital investments to fund the conversion of existing factories to make hyper-efficient cars. The existing fleet of vehicles are not going to be instantly eliminated in favor of efficient cars, as the owners have invested heavily in their current models -- someone who bought a $50,000 SUV is not easily going to be able to absorb the loss by purchasing a new car that is more efficient. At best, the investment in more efficient vehicles may slow the decline of VMTs on the Peak Oil downslope -- but it cannot prevent that decline. There is also the problem of substantial use of oil and mineral ores to manufacture new cars, even efficient ones. Carpooling is a more promising short term mitigation than hoping for 100 mpg cars.

The main source of "liquid fuels" likely to be promoted in Cascadia is conversion of third growth forests and tree plantations to biofuels. While this could make sense on a small scale, as the downslope of Peak Oil becomes more obvious, there will be immense pressure to liquidate forests and convert them into fuel for cars and trucks and other vehicles. Widespread deforestation to create liquid fuels from tiny trees could result in massive carbon dioxide generation -- since the best form of carbon sequestration is to allow forests to return to old growth conditions. Here are some references to consider on this topic:

Mark Harmon
Professor and Richardson Chair of Forest Science
Oregon State University
www.cof.orst.edu/cof/fs/people/faculty/harmon.php
http://outreach.forestry.oregonstate.edu/silvopt/abstracts/harmon..htm
Forest Management Strategies for Carbon Storage

P-090-019

Olga Krankina
Assistant Professor, Sr. Research, Forest Management, Forest Ecology
Oregon State University
www.forestry.oregonstate.edu/cof/fs/people/faculty/krankina.php
several articles by Professor Krakina

Doug Heiken
Oregon Wild
www.oregonwild.org/oregon_forests/old_growth_protection/forests-global-warming/oregon-wild-report-on-forests-carbon-and-global-warming
Oregon Wild Report on Forests, Carbon and Global Warming
"The Straight Facts on Forests, Carbon, and Global Warming"
Executive Summary
Part I. Background: What determines global temperature and climate?
Part II. How does carbon move in and out of the atmosphere?
Part III. How Will Climate Change Affect the Pacific Northwest?
Part IV. How will climate change affect ecosystems, forests, and trees?
Part V. Will the Forests of the Future Become Carbon Sources or Carbon Sinks?
Part VI. What Can We do to Protect Forests from the Perils of Climate Change?
Part VII. Logging Releases Significant Amounts of Carbon.
Part VIII. What Can We Do To Increase Carbon Storage in Forests?
Part IX: Forest Management Recommendations
Part X. What about Forest Fires?
Part XI. Conclusion
Appendix: Myths & Facts about Forests and Global Warming

Lance Olsen
former president, Great Bear Foundation. Missoula, Montana
www.tidepool.org/features/forest.climate.cfm
Swiss Army Knives
How Deforestation Changes the Climate
by LANCE OLSEN [posted.5.10.01]

DEIS mention of Peak Oil is inaccurate

Laws of political physics:
For every expert, there is an equal and opposite expert.
Experts will travel in a straight line over a cliff unless external forces overwhelm inertia.
Experts will try to maintain equilibrium even when the system has become too unstable .
A critical morass of experts are impervious to inputs from outside the bureaucracy.

The CRC Draft EIS is probably the first to acknowledge the reality of Peak Oil, but unfortunately, the writers of this section failed to describe it accurately. The DEIS suggests that there is a maximum scenario for the year 2030 of $100 a barrel for oil, yet this figure was reached on the first trading day of 2008, four months before the publication of the DEIS. It is

P-090-019

astounding that there is no mention in the DEIS of the substantial rise in oil prices during preparation of this report.

One bright spot in the DEIS is the mention of the Department of Energy's Hirsch Report (2005), although the DEIS failed to mention the conclusions of this analysis. The Hirsch Report stated that we would need twenty years to mitigate the impact of Peak Oil, even if we were using toxic technologies such as coal-to-liquids and tar sands. While the Hirsch Report did not specify an opinion on when the Peak would be, oil production worldwide has been essentially flat since 2005 as new oil fields have had a difficult time making up for declining oil fields in the North Sea, Alaska, the Persian Gulf and other areas. Most geologists who have looked closely at the facts have concluded that we are now past the peak for "conventional oil" and almost at the peak for "all liquids" - the latter being a euphemism for including tar sands, natural gas liquids and other liquids that require nearly as much energy to produce as they contain. The consensus in the scientific community is that the era of easy to extract oil that has the maximum "energy return on energy invested" is over, and now we are entering the era of difficult to extract, expensive oil that will have less return on energy invested.

The largest oil fields in the world are all in obvious decline. Here in the western hemisphere, the largest single field is Cantarell in the Gulf of Mexico (on the Mexican side), and it peaked around 2004 (the Association for the Study of Peak Oil and Gas - USA reports that Cantarell has dropped about 33% in the past year). The Alaska North Slope at Prudhoe Bay peaked in 1988, two decades ago, at about three quarter of a billion barrels for the year. In 2006, less than 300 million barrels flowed through the Alaska Pipeline. Even if the Arctic National Wildlife Refuge were opened to drilling, that development would merely slightly change the shape of the downslope. The Earth is finite, therefore there is only so much oil to extract.

2030 design year is past peak

The key points for understanding Peak Oil:

(1) the oil will take decades to run out, peaking is not the same as running out
(2) the exact shape of these curves will probably be different than these predictions,
(3) the issue is when supply no longer keeps up with demand, not when it runs out, and
(4) after the peak, the OPEC countries in the Middle East will have most of the remaining oil

Peak Oil is not about "when the oil will be gone" but rather when demand begins to outstrip supply and production / extraction peaks globally. There probably will be oil extraction for several more decades, although the current perceived abundance (one can buy as much oil as one can afford) is likely to last only a few more years. While petroleum geologists debate the exact timing of the global peak (ranging from essentially now through the middle of the next decade), there isn't any debate about the reality of Peak Oil. Even the most pollyanna view puts the peak at around 2030, although the most experts estimate that somewhere between 2005 and 2012 is more accurate. The pessimists among the geologists who said in the late 1990s that 2010 would be the peak may have been wrong, since there is evidence that 2000 may have been the precise peak, with the rest of this decade being a "plateau" close to 2000 levels before the extraction rates begin their inevitable decline. One factor for determining future levels will be economic forces -- if the global economy crashes into a depression, this would reduce energy consumption rates, making the peak lower and longer lasting (the best possible scenario for using some of the

P-090-019

oil as a bridge toward the renewable energy, locally based society). If the economy heats up, then the peak could be higher but shorter, with the downslope coming sooner and steeper. Whatever the exact year, the days of wasteful overconsumption are limited

The only "debate" about peak oil is the exact timing -- from a long term historical perspective, it does not matter whose predictions about the exact year of peak and decline ultimately prove to be correct.

ASPO's latest estimate is the world "peaked" for conventional oil in 2005, and the peak for all oil will be in 2010. The all oil figure includes unconventional oil such as heavy oil (tarsand / oil shale), polar, deep water, and natural gas liquids. The world is now on the Petroleum Plateau, which will drop off sometime after 2010.

from the Association for the Study of Peak Oil, February 2008 (prepared 2008-01-04)

Colin Campbell, February 2008 issue of ASPO Ireland
www.aspo-ireland.org/contentFiles/newsletterPDFs/newsletter86_200802.pdf

ESTIMATED PRODUCTION TO 2100											End 2007
Amount			Gb	Annual Rate - Regular Oil						Gb	Peak
Regular Oil				Mb/d	2007	2010	2015	2020	2030	Total	Date
Past	Future		Total	US-48	3.7	3.1	2.4	1.8	1.0	200	1970
Known Fields		New		Europe	4.3	3.5	2.5	1.7	0.9	76	2000
1008	724	143	1875	Russia	9.7	9.7	7.8	6.2	3.9	230	1987
	867			ME Gulf	19	19	20	20	17	693	2015
All Liquids				Other	28	27	22	19	13	701	2005
1155	1345		2500	**World**	**65**	**62**	**55**	**48**	**36**	**1900**	2005
2006 Base Scenario				Annual Rate - Other							
M.East producing at capacity				Heavy etc.	6.5	11	5	5	6	212	2030
(anomalous reporting corrected)				Deepwater	6.5	12	11	6	1	68	2011
Regular Oil excludes Heavy Oils				Polar	0.9	1	1	2	4	52	2030
(inc. tarsands, oilshales); Polar &				Gas Liquid	7.7	8	9	9	10	261	2035
Deepwater Oil; & gasplant NGL				*Rounding*				-1	3	6	
Revised 04/01/2008				**ALL**	**87**	**94**	**80**	**70**	**60**	**2500**	2010

www.davidstrahan.com/blog/?p=57
PRIVATE INDUSTRY CONFERENCE FINDS MUCH LESS OIL
Posted on Friday, September 28th, 2007

(Podcast) A secretive gathering some of the world's biggest oil companies has concluded the industry will discover far less oil than officially forecast, according to an executive who attended the event, meaning global oil production may peak much sooner than many expect.

The Hedberg Research Conference on Understanding World Oil Resources was held by the American Association of Petroleum Geologists in Colorado Springs last November to try to reconcile widely divergent estimates of likely future reserves additions. In an interview with Lastoilshock.com, oil executive Ray Leonard said the majority view was that future oil discovery would amount to some 250 billion barrels, rather than the 650 billion barrels suggested by the United States Geological Survey.

P-090-019

www.energybulletin.net/25544.html
Published on 1 Feb 2007 by Bloomberg. Archived on 1 Feb 2007.
Simmons says global oil supply has peaked
by Rhonda Schaffler

Matthew Simmons, chairman of Simmons & Co. International in Houston, talked yesterday with Bloomberg's Rhonda Schaffler about the need to address energy use, his view that global supply has peaked and the likelihood oil prices could reach as much as $300 a barrel. (Source: Bloomberg)

[Transcription of the first few minutes of the interview]
Q: Tell me how you draw your conclusion that at this point we've hit Peak Oil.
A: If you look at the numbers and you follow what's going on starting with Mexico's giant Cantarell field which is now in a very serious state of decline and then you look at the North Sea and you see just the UK and Norway, it's pretty obvious to me that those three areas alone could actually decline by between 800,000 and 1 million barrels a day in 2007. That pretty well wipes out almost all the production gains coming onstream and in implicit in that it assumes that everyone else is flat.
So I think basically too many of our oil fields are too old. Too many now are in decline. The Middle East is basically out of capacity. they're some projects that are being worked upon, but most don't hit the market until 2008, 2009 and we're running out of time.
... I am firmly of the belief that over the course of the next year or two, this issue of peak oil will replace global warming as an issue that we're all worrying, debating and talking about.

FORMER PRESIDENT BUSH ENERGY ADVISER SAYS OIL IS RUNNING OUT
Robin Pagnamenta, Energy and Environment Editor
From The Times
June 30, 2008

The era of globalisation is over and rocketing energy prices mean the world is poised for the re-emergence of regional economies based on locally produced goods and services, according to a former energy adviser to President Bush and the pioneer of the "peak oil" theory.

Matt Simmons, chief executive of Simmons & Company, a Houston energy consultancy, said that global oil production had peaked in 2005 and was set for a steep decline from present levels of about 85 million barrels per day. **"By 2015, I think we would be lucky to be producing 60 million barrels and we should worry about producing only 40 million," he told The Times.**

His controversial views, rejected by many mainstream experts, suggest that some of the world's biggest oilfields, particularly in Kuwait and those of Saudi Arabia, the world's leading producer, are in decline. "It's just the law of numbers," he said. "A lot of these oilfields are 40 years old. Once they roll over, they roll over very fast."

Mr Simmons asserted that this, coupled with soaring global energy demand, meant that world oil prices were likely to continue rising. He said that even at present record highs of more than $140 a barrel, oil remained relatively inexpensive, especially in the US, the world's biggest market. "We are just spoiled rotten in the US," he said. "It's still cheap."

Rising prices will force a tectonic shift in the structure of the global economy by destroying the rationale for shipping many goods, such as food, over long distances, he said.

P-090-019

"This is already happening. In the US, our local farms, ranches and dairies are booming. They are having a huge comeback."

Mr Simmons set out a radical vision of the future, envisaging a society in which food and many other essentials are sourced and consumed locally and increasing numbers of people work from home. He claimed that the alternative was increasing political instability and conflict over the planet's diminishing resources. "We are living in an unsustainable society," he said. "If we don't change we are just going to start fighting one another...So let's just start assuming the worst and plan for it."

However, only this month, BP disclosed figures which indicated that the world had 1.24 trillion proven barrels of oil left in the ground - more than 40 years' worth at current rates of production. BP said that known global reserves had actually increased by 168.5 billion barrels, or 14 per cent, over the past decade. Tony Hayward, the chief executive of BP, said: "The good news is the world is not running out of oil."

BP blamed a lack of investment and access to reserves, rather than geology, for why global oil production was sputtering.

Mr Simmons claimed that many countries had overstated their reserves for political purposes and that so-called flow rates were a better indicator of recoverable volumes. He said that the quality of oil produced by Saudi Arabia and other big exporters was declining.

P-090-020

Peak Oil causing Peak Traffic

The 2005 Final Environmental Impact Statement for the Inter County Connector highway in Maryland, part of the long planned Outer Beltway around Washington, D.C., had this response to a comment that referenced Peak Oil as a reason not to build the road:

> It is speculative to assume that increases in gasoline prices will "reduce congestion." Evidence indicates that very substantial price increases might be needed in order to substantially change transportation choices and decisions. Price increases could cause a variety of responses which might not affect highway usage; e.g. production and acquisition of more fuel-efficient vehicles. The travel forecasts were made assuming a cost per mile for operating an automobile. Historically as the price of gasoline has increased the miles traveled per gallon of gas have also increased. In fact, gas costs less per mile traveled today than it did prior to the first oil embargo in 1974. Petroleum scarcity as a result of consumption in China is speculative.
> - Final Environmental Impact Statement, Inter County Connector (I-370), Maryland

This EIS was correct to state that planning for rising gas prices is speculative, but planning as if prices will remain constant for the next two decades is even more speculative.

It is not "speculation" to predict that higher gas prices will prevent traffic increases. Here is a small example of how this works, which shows that the price increases likely from Peak Oil will lower traffic demand considerably in the design year of 2030.

P-090-020

Please see response to P-090-001.

P-090-020

www.cnn.com/2006/AUTOS/11/30/gas_prices.reut/index.html
Americans drive less for first time in 25 years
Higher gas prices cut not only sales of SUVs, but also time spent on the road: study.
POSTED: 3:47 p.m. EST, November 30, 2006

HOUSTON (Reuters) -- High gasoline prices not only slowed fuel demand growth and cut sales of gas-guzzling vehicles in 2005, they also prompted Americans to drive less for the first time in 25 years, a consulting group said in a report Thursday.

The drop in driving was small - the average American drove 13,657 miles (21,978.8 km) per year in 2005, down from 13,711 miles in 2004

More riders crowd buses

The rising cost of driving sends record numbers to LTD, where human traffic jams the aisles

BY JEFF WRIGHT
The Register-Guard
Published: Thursday, April 6, 2006

TRAFFIC AT THE YORK TOLLS on the Maine Turnpike - a standard measure of tourism in the state - was down in June and even more in July compared with the same time last year. . . Traffic passing through the York tolls had increased every year until five years ago, when it became stable. This is the first time it has dropped significantly; the decrease was 5.3 percent when comparing June 2004 and June 2005, and 5.8 percent when comparing July numbers. . The national average price for regular unleaded gas was $2.41 a gallon, compared with $1.86 a year ago
http://pressherald.mainetoday.com/news/state/050813gasprices.shtml
www.maineturnpike.com/jpgraph/total_by_month.html
www.maineturnpike.com/jpgraph/yearly_totals.html

High gasoline prices filling bus, train seats
Tue Apr 25, 2006
By Bernie Woodall, Reuters

Some mass transit advocates hesitate to say the price spike has forced drivers onto public transportation, including Amtrak spokesman Cliff Black.

But in some cities where the car is undisputed king of transportation such as Houston and Los Angeles, public transportation ridership is up.

In Houston, home to many oil refineries, ridership was up 10.2 percent in the most recent fiscal year, said Houston's Metropolitan Transit Authority, which has a large bus fleet.

In Los Angeles, Metro Rail ridership rose 11.4 percent and the number of bus passengers increased 7 percent in the first quarter of 2006. About 1.4 million ride Los Angeles County buses and trains daily.

It's difficult to say how many are on board because of gasoline prices, said Dave Sotero of the Los Angeles County Metropolitan Transportation Authority.

P-090-020

"When gas prices go up, we do see spikes in ridership," said Sotero. "We're hopeful people who haven't used public transit, they will carry on riding even if gasoline prices drop," said Sotero.

Last week, the Washington Metropolitan Area Transit Authority in the nation's capital had the two highest ridership days in the Metrorail's 30-year history that were not linked to a special event. The highest day was April 20, with 780,820 riders, up 6.2 percent from a year ago.

But WMATA spokesman Steven Taubenkibel said it's hard to peg that on gasoline prices -- nice weather last week may have had more to do with it, he said.

These statistics do not suggest a major shift (yet) due to increasing gas prices, but they hint at much larger changes to come on the petroleum downslope.

Peak Asphalt

http://lcog.org/meetings/mpc/0806/MPC%205g1i_OregonianArticleonCostIncreases.pdf
Soaring costs throw Oregon road projects a curve
Rough road - Officials are facing steep price increases for asphalt and other materials
Monday, July 31, 2006
JAMES MAYER
The Oregonian

www.delmarvanow.com/apps/pbcs.dll/article?AID=/20060616/NEWS01/606160303/1002
Asphalt prices delay pressing road repairs
By Joseph Gidjunis
Staff Writer
The Daily Times, Salisbury, Maryland

www.duluthsuperior.com/mld/duluthsuperior/news/politics/14837423.htm
Fri, Jun. 16, 2006
Asphalt prices skyrocket, highway officials scramble to adjust
JOHN HARTZELL
Associated Press

www.ksla.com/Global/story.asp?S=5026843&nav=0RY5
SHREVEPORT, LA
Asphalt Prices May Mean Fewer New Shreveport Street

P-090-021

Climate greenwash: a quiz

The states of Oregon and Washington are planning to spend about $4 billion for a new, widened I-5 bridge across the Columbia River, which would also extend the Portland light rail a

P-090-021

Please see response to P-090-001.

P-090-021

couple more stops (across the river into downtown Vancouver). What did Oregon Transportation Commissioner Gail Achterman say about the environmental impacts of this expansion?

a. "The Columbia River Crossing project is a major forward step in our effort to reduce the carbon footprint of our transportation system"
b. "We are canceling the highway component of this project and diverting the funds toward public transit in metropolitan Portland and high speed passenger rail for Cascadia" (Eugene to Vancouver BC).
c. "The State of Oregon recognizes the seriousness of the Peak Oil and Climate Change crises, and we are going to implement the Oregon Transportation Plan's policy guidelines to prioritize fixing existing roads before building new capacity."
d. "The I-5 widening is part of the national NAFTA Superhighway proposals, so the state is opposing this proposal to encourage support for regional business instead of outsourcing our production to foreign sweatshops."

Historic and Forecast Gas Emissions in Oregon
Showing Proposed Goals

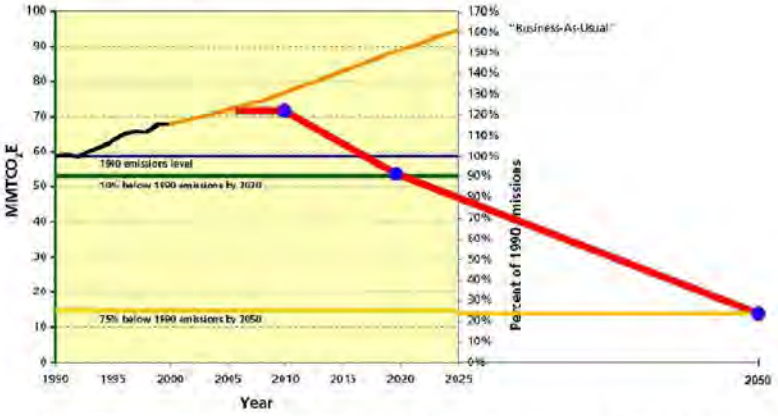


chart from ODOT of carbon pollution reduction targets through 2050. The black line includes the increases during the Clinton/Gore administration. Yellow upward line represents plans for continued "growth." Note that the shape and rate of the downslope almost mirrors the projected downslope of the Peak Oil curve.

In our new Orwellian age of greenwash, war is peace, ignorance is strength, and widening the Interstate highways will clean up the atmosphere. Building multibillion dollar bridges with huge amounts of steel and concrete is very energy intensive and generates a large amount of toxic pollution to manufacture the raw materials. Even building the light rail (and not the road bridge)

P-090-021

would increase carbon dioxide levels in the atmosphere. "Carbon credits" and "offsets" are linguistic tricks, since building a train or installing solar panels and wind turbines cannot sequester existing CO2 back into the crust of the Earth. Proposals to reduce the rate of increase of carbon pollution are not the same thing as removing soot from the atmosphere. The natural biological capabilities of carbon sequestration are already busy absorbing normal CO2 generation from animals and other natural sources, so they are unable to absorb CO2 and methane created by burning fossil fuels.

Instead, it appears likely that oil rationing (whether from price increases or official policy) and depletion is going to reduce the growth of carbon emissions. Calls to reduce carbon levels by various percentages by the year 2050 parallel almost exactly the expected reduction in oil production / extraction. Natural gas is likely to decline faster than oil -- at least in North America. Even coal has been exaggerated, with global coal extraction set to peak around 2025 -- although coal mining requires lots of oil (for transport) and a stable electric grid.

The SDEIS needs to look at the cumulative impact of building a 12 lane bridge, of the land use patterns that would be induced from the new, wider bridge, and the total toxic impact of building the largest option bridge.

Saving Oil in a Hurry: carpooling is part of the answer

In 2005, the International Energy Agency held a forum to discuss "Saving Oil in a Hurry." While in the long run fossil fuel supplies are going to gradually decline, there are numerous scenarios where sudden sharp downward levels of availability could happen -- conflict in oil exporting countries, severe hurricanes in the Gulf of Mexico offshore drilling areas, desire by oil exporters to reduce exports since oil will be more valuable in the future, a US / Israeli attack on Iran followed by Iranian disruption of oil flows through the Persian / Arabian Gulf. There are also plausible possibilities that some oil fields could see much more rapid decline that some planners are hoping for, especially those oil fields that are being pumped out with large volumes of water (a technique that works for a while but risks collapse of the oil field).

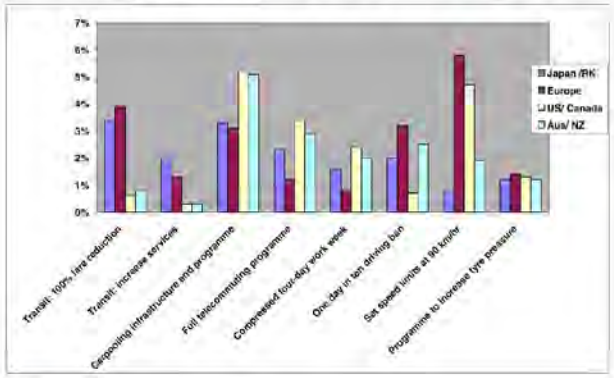
The Saving Oil in a Hurry report suggested that in the United States and Canada, carpooling would have greater energy reductions in the US than free public transit, although no one approach is sufficient. In Western Europe, free transit would have the single biggest reduction in oil consumption. All approaches will be needed, but the opportunity of using all of the seats in the existing traffic flow shows the potential for quick reductions of energy use -- an opportunity that is a social obstacle, not a technological problem.

Regardless of which geologists are ultimately proven correct about oil supplies, we need to prepare to live with much less energy consumption.

http://www.iea.org/textbase/work/workshopdetail.asp?id=210
Workshop: Managing oil demand in transport.
International Energy Agency
European Conference of Ministers of Transport
WORKSHOP: MANAGING OIL DEMAND IN TRANSPORT
Paris, 7-8 March, 2005

P-090-021

Percent reduction in total fuel use by IEA region, selected measures



Imperial College
London

NAFTA Superhighway - ISTEA, TEA-21, SAFETEA-LU

The NAFTA Superhighways are not ONE highway plan, they are a large network of new highways and expanded (existing) highways, a series of north-south interstate highways across the U.S. These new and expanded roads would stretch from Canada through the U.S. to Mexico (excepting certain East Coast routes that would merely connect to ports on the Atlantic or Gulf coasts).

The initial proposal for NAFTA Superhighways was in the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) Federal transportation law, but has now expanded in scope to encompass several "superhighways on steroids." Some of these oversized roads would have many car lanes, truck only lanes, parallel freight train lines, passenger train lines and utility corridors (electricity, oil, natural gas, water, etc).

ISTEA specified the first iteration of the "NAFTA Superhighway" -- to extend I-69 from Indianapolis (its current southern terminus) all the way to Mexico. Highwaymen from several states who each wanted their local and regional boondoggles got together and petitioned Congress to create this full route as a national priority "corridor." The new I-69 is planned to go through southern Indiana, Kentucky, Tennessee, Mississippi, Arkansas, Louisiana and Texas. The southern Indiana section is probably closest to being built.

The 1998 "TEA-21" and 2005 "SAFETEA-LU" laws expanded from the few dozen new "corridors" in the 1991 ISTEA law and the 2005 law has a total of 80 corridors. Some of these

P-090-021 corridors involve upgrading existing highways, some involve construction on "new alignment," a couple of the corridor designations specify numerous road projects in a region.

The planning for NAFTA Superhighways is predicated on continued cheap and abundant gasoline -- an assumption about to receive sobering reality from the underlying geological limits of petroleum production. NAFTA Superhighways are essentially a key component of further "globalization" of commodity production intended to homogenize local communities and further centralize control over manufacturing.

None of the national environmental groups who claim to be concerned about global warming, energy efficiency and public transportation have campaigned against passage of these NAFTA superhighway laws. Some of these groups even supported their passage since a minority of the bill included public transit funding and a few pennies (relatively speaking) for bicycle and pedestrian projects.



1991 ISTEA "priority corridors" - upgrading I-5 from Canada to Mexico is included

This is the bill that some environmental groups considered a great victory for the environment since there were some small improvements for transportation planning requirements (all State DOTs now need a pedestrian / bicycle coordiator, there are new requirements for metropolitan planning for new roads, etc.). However, the bulk of this transportation law was to fund more highways.

P-090-021



from the 2005 "SAFETEA-LU" transportation law

the High Priority Corridors map was copied from the Federal Highway Administration website at www.fhwa.dot.gov/planning/nhs/hipricorridors/index.html

Corridors of the Future program includes CRC and upgrading I-5 in California

The FHWA "Corridors of the Future" program is a new corollary to the NAFTA Superhighway proposals. Some of the "corridors of the future" would include major expansions of east-west highways (especially near Chicago) that would interconnect the north south new / expanded superhighways.

P-090-021



www.fightgridlocknow.gov
www.corridors.dot.gov

The new I-69 NAFTA Superhighway is one of the selected "corridors" for national prioritization.

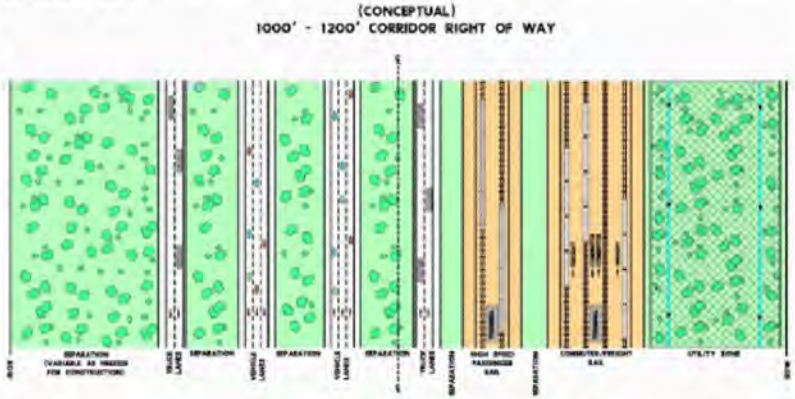
Upgrading I-5 between Canada and Mexico is also a "corridor of the future," although they don't like to use the term NAFTA Superhighway even though I-5 connects Canada, the US and Mexico.



source: www.fina-nafi.org/eng/integ/corridors.asp?langue=eng&menu=integ

P-090-021

The biggest part of the NAFTA Superhighway is the Trans Texas Corridor project, a series of planned super highways without parallel (yes, they are bigger in Texas). It would include freeways for cars, truck only lanes, freight and passenger rail lines, and utilities - power lines, water pipes, oil and gas pipelines. It is a prototype of several other "corridors" around the country, including the Washington Commerce Corridor planned between Vancouver, WA and Vancouver, B.C.



Trans Texas Corridor cross section - the model for the "NAFTA Superhighways"

www.truthbetolled.com
movie about the planned Trans Texas Corridor superhighways (in opposition)

http://dfazack.typepad.com/truth_be_tolled/
blog for "Truth Be Tolled"

www.corridorwatch.org

http://corridornews.blogspot.com
The Trans-Texas Corridors, eminent domain abuse, and the Texas Toll Road Rebellion

http://transtexascorridor.blogspot.com

www.keeptexasmoving.com (pro-TTC)

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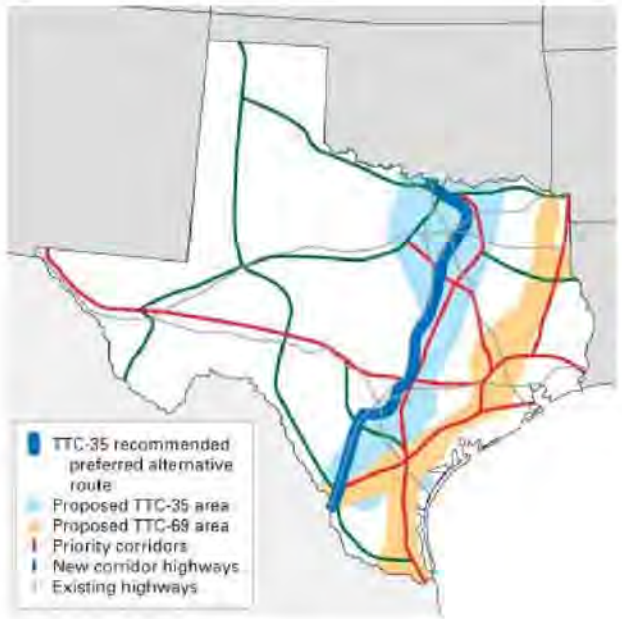


www.aaroads.com/high-priority/corr18.html
excerpt:

the concept of Interstate 69 as a "NAFTA Highway" was conceived by Indiana officials who really wanted the Interstate 69 southwestern extension. To get federal funding, they planned a multi-state routing that would cut through Kentucky, Tennessee, Mississippi, Arkansas, Louisiana, and Texas on its way to Mexico. By marketing the whole "NAFTA Corridor" concept, officials and businessmen in Indiana were able to get federal money behind the project. Of course, money was also secured for the Indiana section.

www.peakoilblues.com/blog/?p=77
Get Your Kicks on Route 6-6-6

I think of a world where fuel is so expensive, and products are so costly to move, that one needs a permit to enter that NAFTA Transnational Superhighway. I imagine that without paying someone off, it will be impossible to get that permit. Wal-Mart gets one. Dole will be cruising it too. Of course Proctor and Gamble, and you can name a few dozen others. And they'll be fast freight trains and bullet trains that will carry 'approved' citizens from one place to another. There'll be fiber optic cable lines running along side to keep our communications open. Once on the highway, the limousines and huge container carriers and trains can fill-up the tank without limits, because, after all, you have a permit to be on there anyway. Along side this Superhighway, are the gas and oil pipelines, and of course, THAT's

P-090-021

why you need the permit to enter, or at least that's the excuse. Gas flows down from Canada, for as long as it lasts, and oil flows up, until the last trickle. It is paid for by Ameros, a proposed currency I never even heard of until a few days ago. Euros, Ameros, Get it?

Washington Commerce Corridor

In Washington State, the DOT has studied creating a "Washington Commerce Corridor" between Vancouver WA and Vancouver BC with car lanes, truck lanes, freight and passenger rail, and utilities (electric lines, water, oil, gas, etc). This is the same model as the Trans Texas Corridor proposals (a large network of new highways around Texas with separate facilities for cars, trucks, freight trains, passenger rail and utilities).

The SDEIS for the I-5 Columbia River Crossing needs to explain how the CRC would interface with the Washington Commerce Corridor proposal, since the WSDOT map shows they are contiguous. Would the Commerce Corridor have "independent utility" if it was approved but the CRC is not? Is the CRC a first step toward construction of the Commerce Corridor? These issues need full examination in the SDEIS.

www.wsdot.wa.gov/freight/CommerceCorridorFeasStudy.html
proposed "Washington Commerce Corridor" - giant NAFTA Superhighway style bypass from Vancouver WA to Vancouver BC

www.seattleweekly.com/news/0427/040707_news_freeway.php
July 7, 2004
Turnpike to Perdition

The idea of a 'commerce corridor,' an enormous toll highway through Western Washington, just won't die.

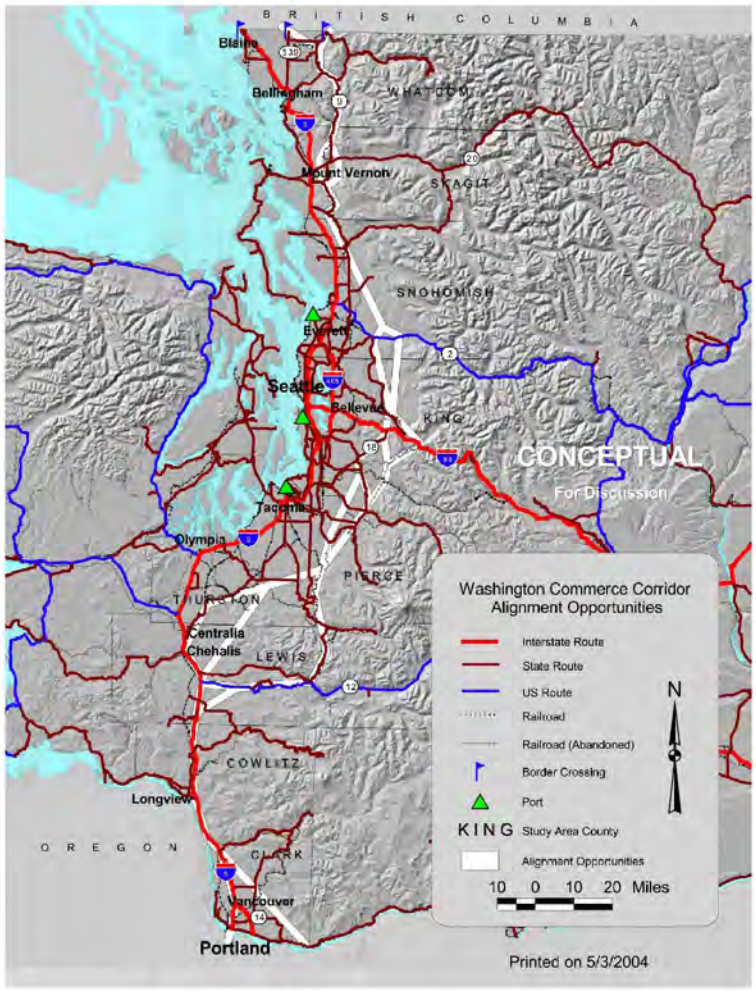
www.tahomaaudubon.org/ConsJune2004.html

www.climatesolutions.org/pages/eNewsbulletins/January_2003/TakeAction_WA.htm
Stop the "I-605 sprawl highway" –
Tell state to focus on real transportation priorities!

The Washington State Department of Transportation (WSDOT) and private consultants are studying the feasibility of a new north-south interstate highway, marketed as a bi-national commerce corridor between Oregon and British Columbia. The proposal for a new 450 foot-wide highway and pipeline corridor east of I-405, is a thinly veiled attempt to build the I-605 beltway – a new highway bypass around the Greater Seattle Metropolitan Area.

Neither a bi-national commerce corridor, nor a new I-605 beltway in the Central Puget Sound Region, would significantly reduce traffic congestion, but both would lead to urban sprawl and destroy farms, forests, and habitat. Further study and funding for I-605 is a waste of valuable time and money that should instead be used to address urgent transportation priorities.

P-090-021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WHATCOM
Mount Vernon
SKAGIT
SNOHOMISH
Everett
Seattle
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THURSTON
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LEWIS
COWLITZ
Longview
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CLARK
Vancouver
Portland
Washington Commerce Corridor
Alignment Opportunities
Interstate Route
State Route
US Route
Railroad
Railroad (Abandoned)
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Printed on 5/3/2004

P-090-022

Tolling without tollbooths: the J. Edgar Hoover Memorial Bridge

I oppose the surveillance system to track everyone's tolls. I would support instead paying for transportation projects through the gasoline tax - those who drive more, those who drive less efficiently would pay more. Pay for the transit component of this project with gasoline taxes, and you'll make more of a dent on the transportation congestion than putting up cameras to record everyone's license plate so that the voyeurs who want to know where everyone is all of the time can spy on the entire population.

The tolling system would charge someone driving a hummer the same as someone driving a hybrid. Gasoline taxes would shift the burden to those driving less efficiently, whether driving a fuel inefficient vehicle, speeding at 70 mph (versus 55) or otherwise driving aggressively in ways that increase fuel consumption.

P-090-023

Coalition for a Livable Future "Climate Smart" Alternative

The Coalition for a Livable Future has proposed a "Climate Smart" alternative. Part of this alternative is worthy of support, part of it is not. Their proposal would build the light rail bridge, but would also establish the surveillance system on the existing bridge.

The Coalition's CRC alternatives reports ignore Peak Oil / Peak Traffic as a reason not to build a 12 lane highway bridge and lack any awareness of the civil liberties implications of the tolling scheme that you support. Climate change is a reason not to build this, but unfortunately there doesn't seem to be any legal hooks to use rising pollution levels to stop the bridge - since EIS's merely require disclosure of impacts, not their prevention. The reality of Peak Oil, on the other hand, can alter the traffic planning analyses used to justify these sorts of boondoggles, since in 2030 we will be lucky if we will be allowed to buy oil for personal consumption. Whatever the price and availability in 2030 turns out to be, it clearly will be considerable more expensive and less available two decades in the future. The CRC project needs a Supplemental Draft EIS to redo their analysis to reflect the reality of Peak Oil and Peak Traffic -- phenomena that are not going to be substantially shifted even if we had a crash program to build hybrid cars and banned SUVs (since we've waited too long to start the transition). Peak Traffic is the Achilles Heel of highway expansion proposals, and could be used to establish a precedent in federal court that would require a shift toward maintenance and transit projects (where are the environmental groups promoting Amtrak upgrades?).

We are not going to have a "livable future" if there's not much demand from environmental groups for ecological, socially just approaches to coping with the end of cheap oil as we navigate the downslope of Hubbert's Peak. Improving transit systems is nice, but only a tiny part of what would need to be done - food is likely to be a more serious problem than the obstacles to personal transportation.

Instead of an electronic toll that gives the Department of Fatherland Security a database of everyone's travels, taxing gasoline at the pump is more equitable since it charges for all trips, rewards those who drive the speed limit (speeding wastes fuel), encourages more efficient cars (tolls tax Hummers and Hybrids the same). A gas tax coupled with rebates for the poor would be

P-090-022

Please see response to P-090-001.

P-090-023

Mr. Robinowitz makes a number of interesting points in this part of his letter but does not appear to raise any specific, substantive disagreements with the FEIS that are not already responded to in the above comments.

P-090-023

the ideal solution, one that the Democratic Party probably wouldn't support but this doesn't mean the environmental groups have to support their myopia. Merely having a toll would penalize the poor since the wealthy aren't going to be substantially impacted by paying a couple bucks to cross the bridge every day.

Some of the literature from the CRC opponents even suggests the need for a a "carbon neutral" river crossing. However, the only "carbon neutral" alternative would be swimming or perhaps paddling a canoe (if the canoe was made from locally available materials and did not involve any fossil fuels in its manufacture). Even the light rail (which I support) would not be so-called "carbon neutral" since a lot of coal and some natural gas is burned for Portland's electricity.

If the light rail fuels a lot more construction in Vancouver WA (doubtful given the economic contraction that is now unfolding) then it could lead to an increase in car traffic (since only some of the new workers or residents would use the rail system). Building with concrete and steel uses lots of fossil fuels and minerals -- something to consider given we are past the point of "overshoot." Smart growth would have been a good idea in 1950, but now it is too little, too late.

It's worth remembering Martin Luther King's objections to highways, made the week before the federal government stopped his campaigning for justice:

"These forty million [poor] people are invisible because America is so affluent, so rich; because our expressways carry us away from the ghetto, we don't see the poor."
-- Martin Luther King, "Remaining Awake Through a Great Revolution," March 31, 1968

The Coalition for a Livable Future includes David Evans and Associates on their board even though they are one of the main ODOT contractors for new highway construction in Oregon. DEA is a key contractor for the Columbia River Crossing and the Sunrise Freeway in Clackamas County, among other road projects. It seems like a conflict of interest even if David Evans and Associates has some staff who do non-highway projects (light rail, perhaps?).

www.clfuture.org/about/staff-board/document_view
Jo Ann Bowman, Member at Large
Sam Chase, Community Development Network
Amanda Fritz, Friends of Arnold Creek
Lisa Gramp, Member at Large
Felisa Hagins, SEIU Local 49
Mike Houck, Urban Greenspaces Institute
Mary Kyle McCurdy, 1000 Friends of Oregon
Marcy McInelly, American Institute of Architects
Martha McLennan, Northwest Housing Alternatives
John Mullin, Social Services of Clackamas County Inc.
Marcus Mundy, Urban League of Portland
Kelly Rodgers, **David Evans and Associates**
Bob Sallinger, Audubon Society of Portland
Lara Skinner, Member at large

P-090-024

Reviving the Rails: a best case Peak Oil scenario

"In the United States, we have a railroad system that the Bulgarians would be ashamed of. We desperately are going to need railroad transport for moving people around, for moving goods around – we don't have that. What we do have is a trucking system that is going to become increasingly dysfunctional, especially as the expense mounts of maintaining the tremendous interstate highway system. It costs so much money every year to maintain what the engineers call a high level of service – which means that the trucks that are delivering things from the central valley of California to Toronto don't break their axles while they're bringing those Caesar salads to Toronto. Once you have a certain number of trucks that are breaking their axles in that 3,000 mile journey, that's the end of transcontinental trucking – which also implies that this is the end of certain economic relationships that we have gotten used to."
-- author James Howard Kunstler, from an interview in the film "The End of Suburbia: Oil Depletion and the End of the American Dream"

It is serious time to look at the nationalization of America's critical infrastructure industries: oil, gas, electricity, and others that have gouged the American consumer and now deserve to lose their windfall profits in a nationalization effort that will return to them ten cents on the dollar, if they are lucky.
- Wayne Madsen Report, April 25, 2006

In the 1960s, the success of freeway fighters in stopping the Boston Inner Belt spurred Congress to change transportation laws to allow money programmed for Interstate highways to be used for public transit. Several rail systems were created from unused freeway funds, most notably the initial construction phase of the Washington, D.C. Metro.

If the United States ever makes shifts to have an ecological, socially just policy to cope with Peak Oil, it would need to shift money from the NAFTA superhighway program to a serious revival of inter-city rail to efficiently move people and goods with less energy consumption.

A best case scenario for mitigating Peak Oil could include

- bullet train service between cities (with solar panels lining the tracks to provide some of the power),
- light rail and better bus service on major roads,
- major investments in renewable energy and hyper-conservation,
- land use shifts to reduce commuting distances,
- widespread suburban agriculture to convert lawns into food production (which would reduce truck deliveries),
- other steps to reduce our demand for oil, coal, natural gas, uranium, concrete, and mineral ores.

If we continue on the current road of overshoot, the likely consequence will be a "national Katrina" disaster, where a small group would still have access to fuels, capital, and quality food while a much larger underclass would be left to scramble for survival. But that dismal potential shares one outcome with the "positive scenario" -- both the cooperative, conservation future and

P-090-024

Please see response to P-090-001.

P-090-024

the collapse scenario would greatly reduce need for more highways. Whether we cope with Peak Oil and climate change or continue to ignore the problems until they become catastrophic and un-mitigable, there is no need to continue to expand highway network.

Relocalizing production and building renewable energy systems is a bigger priority for using the remaining oil than more freeways for Wal-Mart delivery trucks.

Future generations will regret that essential farmland was paved over - not that one more dumb highway was not built.

Politicians who have nothing practical for the public to mitigate the consequences of Peak Oil risk being thrown out of office once the price of gas goes up and stays up. Who will get the blame for ignoring the issue?

The most important question regarding planning for 2030 is what type of economy we will have after the cheap abundant oil is replaced by expensive, scarce oil. Will we use the remaining oil to relocalize production and build lots of renewable energy equipment or will this oil be used to build more freeways and fuel a futile World War to control the remaining oil fields? The answers to these questions determine the future of the human race.



This map shows a proposal from US Department of Transportation for high speed rail in the United States. Note that the Cascadia high speed train service has languished in obscurity, unfunded, ignored by politicians proclaiming themselves to be green and interested in "sustain a bull" transportation. While Washington State is making some modest upgrades to the train line -- which will provide some slightly faster Amtrak service -- the State of Oregon is doing its best to ignore problems of Willamette Valley train service.

The ODOT report "I-5 Rail Capacity Study" (February 2003), archived at www.oregon.gov/ODOT/RAIL/docs/railcapstudy.pdf estimated it would cost about $170 million to make substantial fixes to the freight rail network in the Portland area to permit increased passenger train service and unclog freight train congestion (partially caused by the import of cheap crap from China into western ports in Portland, Seattle, Tacoma and other locations).

P-090-024

The SDEIS needs to consider increased Amtrak service from Vancouver, Washington to Union Station in downtown Portland as part of the transportation mix.



Amtrak: old and new (80 and 120 mph theoretical speeds if the tracks were fixed). The Amtrak Cascades could connect cities much quicker if the tracks were upgraded to accommodate the speed it is capable of.

A side issue: solar photovoltaic panels should be installed along the tracks of the light rail, along I-5, and even along the freight rail routes where possible. This is done in a growing number of European communities, since the right of way is already cleared (and usually in public ownership). Perhaps solar panels could be used to create a roof over the bike path on the future light rail CRC bridge to keep bicyclists and pedestrians dry during the rainy season.

P-090-024



ACELA: Amtrak's high speed service from Washington, D.C. to Boston (150 mph). It is not quite the same quality of service as found in Japan, France, Germany, the Eurotunnel, Taiwan, Korea and other places with dedicated high speed routes, but it is the best train route in North America. How many high speed routes could be built for the cost of a new Trident submarine, more Stealth bombers or other Weapons of Mass Destruction that are Made in the USA? Unfortunately, even if there was a national shift in priorities to build super trains, the locomotives would have to be imported since there is almost no domestic train production capacity after decades of deliberate neglect. (The Amtrak Cascades train was built in Spain, not Puget Sound or the Willamette Valley.)

P-090-024

Transrapid 08

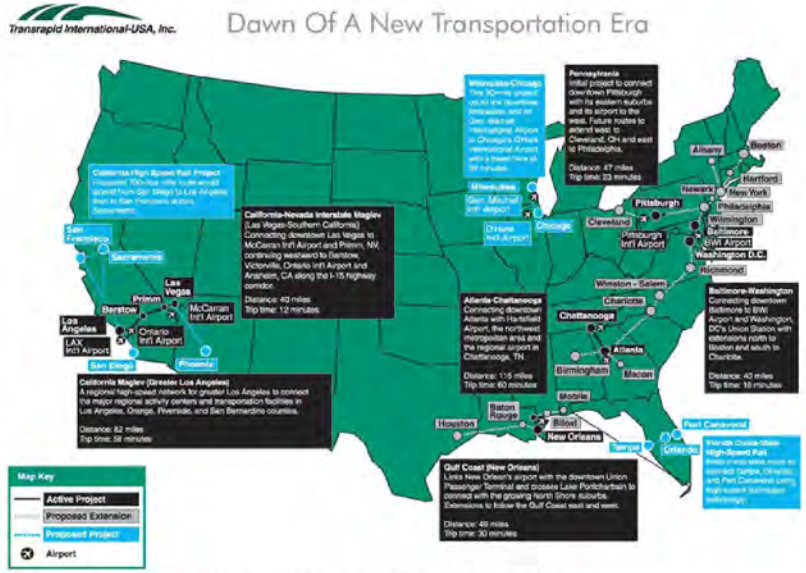
Transrapid International



Maglev: 220 to 300 mph - German test track

34

P-090-024



proposed pilot projects for magnetic levitation trains in the U.S.

P-090-025

Rebuttal of DEIS energy sections

3.12 Energy

Policies at the federal, state and local levels support energy conservation for all sectors, including transportation. Transportation energy efficiency is largely regulated though requirements on vehicle manufacturers rather than transportation infrastructure. There are no established standards to determine when a transportation project has an energy "impact." This DEIS compares the relative energy demands of the different CRC alternatives and discusses options that could reduce energy consumption during project construction and operations. This information is based on the CRC Energy Technical Report.

3.12.1 Existing Conditions

This section gives an overview of national and state energy supply and demand, with a focus on transportation demand and on petroleum—the primary energy source for transportation.

National Energy Demand

At the national level, industrial uses had the highest share of energy demand in 2005. **However, the transportation sector's energy demand is expected to grow by 1.4 percent annually—to a 29.9 percent share by 2030—and will exceed the industrial sector's demand. Of the total energy projected to be used by transportation in 2030, 97.4 percent is expected to come from liquid fuels and other petroleum products.** Even

note: in other words, transportation is going to remain very dependent on liquid fuels. Petroleum has the highest energy density of any known liquid fuels and has the greatest Energy Return on Energy Invested (EROEI) of any known liquid fuels.

with improvements in fuel consumption rates and increasing use of alternative fuel sources, **the high passenger travel demand and increasing use of trucks for freight is expected to result in a substantial increase in energy demand.** The transportation sector (including aviation, marine,

note: this alleged increase in demand is unlikely to be met with a parallel increase in supply. Just because there is a demand does not mean that oil fields can be extracted faster.

freight rail and roads) accounts for about 68 percent of our nation's petroleum consumption.

Washington and Oregon Energy Demand

The total demand for all energy sources in Washington State has grown steadily, although the per capita consumption rate has declined several times since the early 1970s. The demand for energy from coal and natural gas in Oregon and Washington is substantially lower than the

36

P-090-025

Please see response to P-090-001.

P-090-025

national average, but is offset by the demand for hydro-electric power. Washington is the leading hydroelectric power producer in the nation. However, as of 2004, energy derived from petroleum products accounted for the largest single share (42.0 percent) of energy consumed in Washington, slightly higher than the 2005 national demand of 40.5 percent. **In 2000, approximately 47 percent of Oregon's energy consumption came from petroleum.** Since then, petroleum's share of

note: this shows that Oregon's transportation system is totally dependent on petroleum (since the non petroleum energy supplies generally run the electric power grid, not transportation

total demand has decreased, but still accounts for the largest share of energy consumption at 35.7 percent, notably lower than the national average. As illustrated in Exhibit 3.12-1, the transportation sectors in Washington and Oregon (including aviation, marine, freight rail and roads) account for about 71 percent and 82 percent, respectively, of each state's total petroleum consumption. In Washington, state-wide petroleum demand in the industrial sector is nearly four times that of Oregon, increasing Washington's non-transportation use of petroleum.

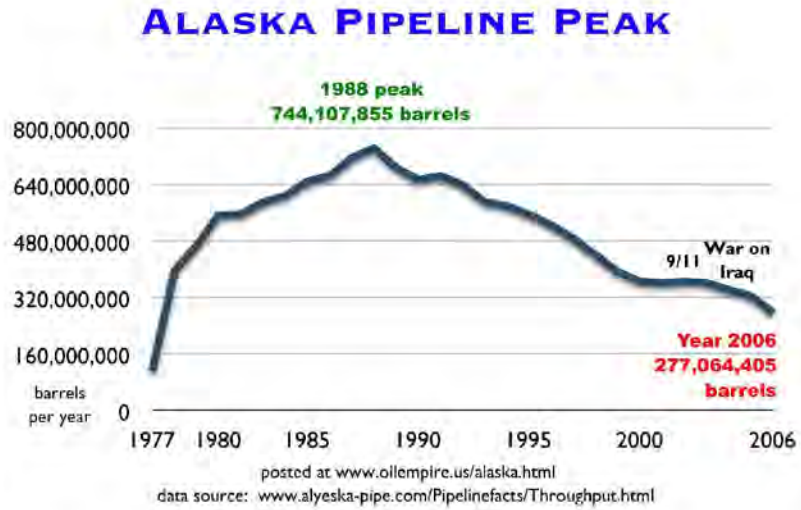
COLUMBIA RIVER CROSSING
3-318 CHAPTER 3 ENERGY
Peak Oil and Global Supply and Demand
Peak oil refers to the time frame in which the maximum global petroleum production rate is reached, after which the rate of production enters a terminal decline. Peak oil and its relevance to the CRC project is discussed in the Cumulative Impacts section.
The trend toward more fuel-efficient vehicles is expected to continue in the future because of recent government requirements for higher fuel efficiency standards and rising petroleum prices. Promoting alternative fuel sources for transportation, such as ethanol, biodiesel, compressed natural gas, liquefied petroleum gas, and electricity has also been increasing. Nonetheless, petroleum demand in Washington, Oregon and the project area is projected to increase.
Washington and Oregon Petroleum Supply
Because gasoline and diesel are the primary energy sources for the transportation sector, the analysis of energy supply focuses on petroleum-based fuel sources. **Approximately 90 percent of Washington's current supply of crude oil comes from the Alaska North Slope**. Five refineries in the Puget Sound area distribute refined

37

P-090-025

petroleum products to Washington and adjacent states. **Oregon imports 100 percent of its petroleum, of which approximately 90 percent comes from Washington refineries. Both states' future supply of petroleum is largely dependent on domestic production and reserves. Oil production from the North Slope peaked in 1988 and is projected to continue declining.**

note: In other words, Oregon and Washington are totally dependent on outside sources for oil, and the main source of that oil has been in decline for two decades -- down by two-thirds since the peak.



Energy Use in the CRC Project Area

The estimated existing daily energy use for the regional transit system (including the regional MAX light rail system and all of C-TRAN's and TriMet's buses and other transit vehicles) is approximately 2.8 x 10_9 Btus. For cars and trucks crossing the river on I-5 and I-205, the estimated daily energy use is about 1.3 x 10_9 Btus. The estimate for existing and future highway energy use is based only on the crossing portion of highway trips. It does not estimate regional highway energy demand or even project wide demand. The reason for setting these boundaries for the highway energy estimates is twofold. First, the impact on highway energy demand outside the corridor would be minimal. Second, **highway speeds and congestion have a strong influence on fuel efficiency and thus energy demand. Traffic analysis completed for the**

38

P-090-025

CRC project provides reliable speed and congestion estimates for the river crossing, but not elsewhere in the region. For these two reasons,

rebuttal: Neither Oregon nor Washington is planning to reduce highway speed limits to the Nixon era 55 mph to reduce energy consumption (although when the oil crunch becomes more obvious this decision may become inevitable). While idling cars do waste oil, cars traveling 55 mph also use lots of oil, and the impacts of "induced traffic" and induced sprawl development from new highway construction / expansion need to be factored in to these analyses. It is incorrect to suggest that a bigger bridge will reduce energy consumption - the excessive construction would be very energy intensive and the plans for extra traffic versus a Peak Traffic Alternative would consume vast oceans of fuel.

highway-related energy demand is based on the estimated traffic volumes, vehicle types and travel speeds for the crossings themselves. This captures the most meaningful effects and provides a reliable comparison among alternatives, even though it does not capture all of the potential highway energy savings.
The analysis of transit-related energy demand looks more broadly, primarily because this allows the analysis to capture the effect that the CRC alternatives have on transit operations outside the immediate project area.

3.12.2 Long-Term Effects of Project Alternatives

By 2030, energy consumption by vehicles on regional roadways, including I-5 and I-205, will increase substantially over existing conditions. This will occur largely because population growth will increase the number of cars, trucks, and buses on the road. At the same time, average vehicle fuel efficiency is expected to improve as new,

more fuel efficient and alternative fuel vehicles replace old ones.

rebuttal: It is not physically possible on the downslope of oil extraction for future consumption to be greater than the peak of production. While fuel efficiency may increase, the overall availability of energy will decline faster than federal mandates to force higher mileage standards. Alternative fuels that are under consideration have substantially lower "energy return on energy invested," so they will not be able to replace existing use of oil.

Exhibit 3.12-2 shows predicted fuel consumption in the year 2030. Highway energy use is projected to decrease for all of the build alternatives compared to the No-Build Alternative. Highway-related energy savings would likely be greater than shown as this table indicates only the energy reductions associated with the actual river crossing. The lower energy demand for the highway crossing is due to three primary factors:

- **Increased I-5 bridge capacity decreases the duration of congestion**

P-090-025

and increases average speeds. This improves fuel efficiency. Compared to stop and go traffic, fuel efficiency improves as average speeds increase, until the speeds reach free flow conditions.

rebuttal: Peak Traffic means that before 2030, substantial reductions in traffic flow are a certainty, thus removing the alleged "need" for highway widening across the river. Instead, extra effort should be made for expanded light rail, carpooling, world-class Amtrak service, better bus service, and other initiatives to help citizens cope with the end of cheap oil.

• CRC provides high-capacity transit that is expected to divert a portion of personal vehicular travel demand to transit, which uses less energy per passenger.
• Tolling the I-5 crossing is expected to deter some trips across the river, which reduces energy demand.

rebuttal: a more equitable means to raise the funds would be to tax gasoline at the pump, preferably at the same level on each side of the state border. Refunds could be pro-rated to lower income people to prevent an apartheid transportation system based on class. Forcing poorer people onto the new light rail train while richer people continue to drive is a form of environmental injustice.

Total energy use would rise with Alternatives 4 and 5 primarily due to the increased level of transit operations. Total energy use would decline with Alternatives 2 and 3 compared to the No-Build Alternative.
Alternative 1: No-Build
Exhibit 3.12-2
Future 2030 Energy Consumption (Million Btu)
Alternative 1
No Build
I-5 crossing 793.6
I-205 crossing 831.7
Highway Crossing Subtotal 1625.3
Conventional bus 3,238.1
Biodiesel bus[a] 0
Light rail 520.8
Transit Subtotal 3758.9
Total 5384.2
Source: CRC Energy Technical Report.
a Both transit operators have commitments to biodiesel utilization, and have begun investing in biodiesel vehicles. But for the No-Build analysis, no assumptions were made about the percentage of the vehicle fleets that may one day run on biodiesel. There is similar support for diesel/electric hybrid vehicles, though no assumptions for such were made in this analysis
The No-Build Alternative is projected to have higher energy consumption than Alternatives 2 or 3 (by about 3 percent), and lower than Alternatives 4 and 5 (by about 6 percent).

P-090-025

rebuttal: it is physically impossible for any alternative proposed today for the year 2030 to have an increase in energy consumption since the energy to be consumed is non-existent. Peak Oil will force a reduction in overall consumption regardless of government plans in Environmental Impact Statements. A Supplemental Draft EIS is needed to accurately project energy supplies in the design year of 2030.

3.12.3 Long-term Effects of Project Components

This section describes impacts of the components that comprise the project alternatives.

Multimodal River Crossing and Highway Improvements (Replacement Crossing with Alternatives 2 and 3; Supplemental Crossing with Alternatives 4 and 5)

The highway improvements associated with the replacement crossing would reduce energy demand relative to the highway improvements associated with the supplemental crossing because the additional capacity would decrease the amount of time cars spend in stop and go traffic. This improves fuel efficiency.

Transit Mode (BRT with Alternatives 2 and 4; LRT with Alternatives 3 and 5)

Light rail would reduce energy demand relative to bus rapid transit, although the difference is minor. Both modes would reduce energy demand compared to providing no high-capacity transit system in the CRC corridor.

The additional electrical energy consumed by daily operations of maintenance bases would be negligible compared to the energy consumed for transportation. Expanding either the bus maintenance base in east Vancouver or the light rail maintenance base in Gresham would not measurably affect long-term energy use.

Transit Terminus and Alignment Options (with all Alternatives)

The Lincoln terminus would use slightly less energy than the Kiggins Bowl terminus, because it is a more direct and shorter route to North Vancouver.

The transit component of full-length terminus options would consume more energy than the transit components of either of the minimum operable segment (MOS) terminus. The Clark College MOS would require approximately 1.4 percent less energy. The Mill Plain MOS, which represents the shortest high-capacity transit line length, would have the lowest energy use by approximately 2.4 percent compared to a full-length terminus. Construction energy demand would be lower for the minimum operable segments.

The transit alignment options would not affect the overall energy demand of the project, as summarized above for the alternatives.

Transit Operations

Increased transit operations (service frequency) would increase the

P-090-025

transit operational energy demand compared to the Efficient operations option. While the Increased transit operations would result in fewer autos crossing the river, and thus some reduction in highway energy demand, that decrease is not proportional to the added energy demand from the substantial increase in transit service associated with the Increased versus Efficient transit operations.

Tolling Scenarios

Tolls on the I-5 crossing are included in all build alternatives. Other tolling scenarios were studied to analyze how tolling would affect demand on the roadway.

Under tolled scenarios, the replacement crossing would result in 178,000 daily vehicle trips across the I-5 bridges and 213,000 vehicle trips across the I-205 bridges. If no toll were collected in 2030, the I-5 crossing's daily traffic levels would increase by 32,000 vehicles (18 percent). I-205's daily traffic would decrease by 13,000 vehicles (6 percent). Without tolling, an additional 19,000 (5 percent) cross-river vehicle trips would be made in 2030.

rebuttal: It is impossible for traffic levels to increase when overall energy supplies will be substantially lower in 2030 than today in 2008. A Supplemental DEIS is needed to model a Peak Traffic Alternative.

Due to the supplemental bridge's assumed higher toll, less available highway capacity, and provision of an enhanced transit system, daily I-5 vehicle crossings would be 13,000 vehicles per day lower compared to the replacement bridge, while I-205's crossings would increase by 6,000 vehicles per day. Overall, there would be 7,000 fewer vehicle crossings of the Columbia River via I-5 and I-205.

The No Toll scenario would have the highest daily energy use. Compared to the No Toll scenario, the Standard Toll on I-5 scenario would consume approximately 1.9 percent less and the Standard Toll on

COLUMBIA RIVER CROSSING

3-324 CHAPTER 3 ENERGY

Estimating Construction Energy Use

The approach for estimating energy use during construction is based on a method developed by the California Department of Transportation. It estimates energy requirements for a variety of construction activities (building structures, electrical substations, site grading, etc.) by relating project costs to the amount of energy

42

P-090-025

needed to manufacture, process, and install construction materials and structures.

Both I-5 and I-205 would require approximately 3.6 percent less operational energy.

3.12.4 Temporary Effects

The method used to estimate energy use from construction is based on applying a factor to construction cost estimates. This provides a straightforward albeit relatively simplistic approach for comparing the relative energy demand of alternatives.

Based on this estimating method, Alternative 3 (replacement crossing with light rail) would require the most energy to construct (estimated at about 7.28 x 10_{12} Btus), followed by Alternative 2 (3.2 percent lower), Alternative 5 (about 19.7 percent lower), and Alternative 4 (about 23.3 percent lower). Energy to construct Alternative 4, the lowest-cost full alternative, is estimated at about 5.90 x 10_{12} Btus. The two minimum operable segments are shorter and less expensive to build, and would thus require less construction energy.

For the components that make up the alternatives, light rail construction would consume more energy than bus rapid transit; and, constructing the Kiggins Bowl terminus (A) would use more energy than the Lincoln terminus (B).

3.12.5 Potential Mitigation

Potential Mitigation for Temporary Effects

A variety of potential measures could reduce energy consumption from construction. As the project advances in design, and more detail is available on construction needs and activities, additional analysis will help identify specific measures and approaches for reducing energy consumption during construction. Potential measures include:

- Construction materials reuse and recycling.
- **Encouraging workers to carpool.**

The SDEIS should consider encouraging all workers to carpool, not merely those working on the construction of the CRC.

- Turning off equipment when not in use to reduce energy consumed during idling.
- Maintaining equipment in good working order to maximize fuel efficiency.
- As practical, routing truck traffic through areas where the number of stops and delay would be minimized, and using off-peak travel times to maximize fuel efficiency.
- As practical, scheduling construction activities during daytime hours or during summer months when daylight hours are the longest to

P-090-025

3.19.11 Energy and Peak Oil

Cumulative effects related to energy use are partially incorporated into the long-term energy demand estimates prepared for the CRC project. Those estimates are based on travel demand forecasts that factor in

59 Hamlet and Lettenmaier, 1999.

60 Enertech Consultants, 1998.

COLUMBIA RIVER CROSSING

3-438 CHAPTER 3 CUMULATIVE EFFECTS

projected local changes in land use patterns, employment, population growth, and other programmed transportation improvements.

The cumulative energy impact of primary concern is "peak oil." Peak oil refers to the point in time at which the maximum global petroleum production rate is reached, after which the rate of production enters a terminal decline. **Peak oil results from many incremental actions, few of which are individually important. However, the potential impact of reaching peak global petroleum production is an important consideration for projects, such as CRC, intended to address transportation needs for decades to come.**

Oil production in the United States—the world's third largest oil producing nation—reached its peak around 1970 and has been in a declining trend since then. Most estimates place peak global production occurring some time between 1990 and 2040.

rebuttal: No credible estimates ever placed peak around 1990. Even the earliest projection - from M. King Hubbert in 1956 - estimated that the global peak might be in the mid 1990s. While Hubbert's 1956 prediction that the US would peak around 1970 was accurate, he was off by a decade for the global peak since he didn't include the reduction of consumption that happened as a result of the 1973 Saudi Oil Embargo and gasoline disruptions as a result of the Iranian revolution.

Currently, in 2008, no credible scientist estimates that 2040 is the peak of global oil. The only debate among the experts who have closely examined the data is whether we are now at Peak Oil (on a temporary plateau) or whether the peak is just ahead, a couple of years in the future. Some disingenuous voices suggest that tar sands and coal to liquids should be given equal weight in this discussion even though they take nearly as much energy to produce as they contain. When fuels require more energy to produce than they contain, they cease to be sources of energy, regardless what the ostensible price is to purchase.

The SDEIS needs to factor in the best science about the state of petroleum geology and recognize that we are at - or at least near - the point of Peak Oil.

When oil production drops below oil demand, it is likely to cause petroleum prices to increase. There are uncertainties, however, regarding peak oil's timing and the availability of substitute fuels. Peak oil's effect on transportation fuel prices and travel behavior will depend largely on

44

P-090-025

when peak oil occurs and the availability of substitute fuels. Peak oil's potential effects on economic activity and travel behavior could affect the CRC project. The concern is that if substitute fuels are not readily available as petroleum supplies decrease, **the rising cost and reduced supply of petroleum could directly reduce auto and truck travel, and could result in dramatic reductions in economic activity, which, among other effects, could further reduce vehicle trips below forecasts. These vehicle trip forecasts influence the proposed size, design, and financing of transportation facilities. If fuel prices increase faster than expected, then the number of 2030 highway trips could be lower than forecasted.** However, even with relatively substantial fuel price

rebuttal: Fuel prices have already increased faster than the assumptions used in the DEIS, which projected that 100 dollars a barrel might be reached by the year 2030. A SDEIS is needed to re-calibrate the traffic models to factor in the impacts of substantially higher energy prices (oil, natural gas, coal, etc) by 2030.

increases, the future demand would still be greater than the expanded highway capacity. Because fuel costs represent only a portion of total transportation costs (which include everything from car payments, to insurance and maintenance) even large growth in fuel costs translates to a smaller growth rate in total transportation cost, which is what most directly affects travel demand in the long term.
Global oil demand is projected to grow by 37 percent by 2030, driven in large part by transportation needs;[62] local transportation energy demand is expected to grow as well, although the CRC build alternatives are projected to reduce future transportation petroleum demand compared to No-Build. At the global scale, these fuel savings will be very small but incrementally beneficial over the No-Build Alternative.

rebuttal: demand may continue to grow, but no credible geologist suggests at this point (2008) that global oil extraction can grow by 37 percent by 2030. The only debate among Peak Oil experts is whether we have already peaked worldwide, or whether there might be some extra, secret oil in Saudi oil fields and a few other locations that will delay the peak a few years (although not to 2030 under any credible scenario). The work of the Association for the Study of Peak Oil - www.peakoil.net and www.aspo-usa.org - represents the best efforts of the world's pre-eminent petroleum geologists and does not support the claim that oil flows could theoretically increase in 2030 over current levels. A more realistic analysis would show that by 2030 we are more likely to have a 37 percent REDUCTION in oil supplies, although the decline could be steeper than this.

The CRC alternatives include a number of elements that would reduce adverse impacts related to peak oil. These include:
• The bridge and highway improvements are focused on replacing or updating aging infrastructure, not on building new highway corridors

P-090-025

61 Hirsch, 2005.
62 EIA, 2006.

What does the U.S.
Department of Energy say
about peak oil?
A report by the US Department of Energy61
included the following conclusions:
• World oil peaking is going to happen, and will likely be abrupt.
• The problem is the demand for liquid fuels (growth in demand mainly from the transportation sector).
• Mitigation efforts will require substantial time.

note: The Hirsch Report stated that we would need two decades to minimize the impact. Since Peak Oil is here, now, the subtext of this report is that President Jimmy Carter was right, but the fact that his half hearted efforts were sabotaged by the financial, political and military systems suggests that we are unprepared to cope with the unfolding crisis.

• Both supply and demand will require
attention.
• More information is needed to more precisely
determine the peak time frame.
DRAFT ENVIRONMENTAL IMPACT STATEMENT
CUMULATIVE EFFECTS EXISTING CONDITIONS AND ENVIRONMENTAL
CONSEQUENCES **3-439**
Has transportation
infrastructure been able to
adapt to change?
Transportation infrastructure has proven to
be relatively adaptable. For example, the
northbound I-5 bridge over the Columbia
River was built in 1917 as a two-lane bridge
that originally carried electric trolley cars and
Model T autos (which ran on either gasoline
or ethanol). While it is now obsolete in terms
of seismic safety and traffic safety design

P-090-025

standards, it was able to periodically adapt to nearly a century of changes in transportation technology, energy policy and prices, vehicle types, and travel behavior.

rebuttal: those changes were in the direction of increased energy consumption. We now face an era of declining energy consumption, a totally new experience without precedent (save for collapses of pre-industrial civilizations such as Rome)

• They include substantial improvements to public transportation, with projected increases in transit mode share in the afternoon peak direction from 13 percent with the No-Build to as much as 21 percent with light rail transit
• They provide substantially improved facilities for non-motorized transport
• They support land use planning that seeks to control sprawl, concentrate development, and decrease auto dependency
• They include road use pricing (highway tolling)
• Because of the addition of high-capacity transit and the bridge toll, all build alternatives are projected to have lower daily I-5 river crossings than under the no-build.
• They improve highway operations at a key pinch point which improves fuel efficiency and lowers emissions.

rebuttal: Peak Traffic makes this assertion somewhat moot, since less traffic by 2030 will see reduced congestion anyway. Carpooling, increased public transit, telecommuting and other approaches will have more impact on energy consumption that pretending that doubling the width of the highway will reduce energy consumption.

• They increase highway safety which decreases collisions and congestion, further improving fuel efficiency.

rebuttal: While there may be some traffic safety issues to be mitigated with changes to road design, requiring drivers to prove they still know how to drive and to be courteous when getting a driver's license renewal would be the single most effective approach. There is no need to double the width of I-5 merely to reduce the risk of accidents, especially as Peak Traffic sets in.

Another concern is the ability of current transportation infrastructure to adapt to post-peak oil vehicles and technology. Based on the alternative fuel vehicles that are currently being researched and developed, it is highly likely that the CRC infrastructure (transit guideway, bridges,

P-090-025

highway, and bike and pedestrian paths) will be able to accommodate foreseeable changes. Electric hybrids, electric plug-ins, and vehicles powered by bio-diesel, ethanol, or hydrogen fuel cells are being designed to operate on modern roads and highways. The CRC transit guideway,

rebuttal: Biodiesel is a great fuel (I use it) but it is unlikely to be scaled up to completely replace petroleum based diesel. Biodiesel also must be blended with petroleum diesel when temperatures go below 40 degrees (F). Some people suggest that (genetically altered) algae may be able to generate liquid fuels in substantial quantities, but this is not yet proven and the risks of these engineered organisms escaping into the environment and causing massive pollution is not well understood.
A biomass opponent recently wrote this:

In 1992, at the Oregon State University's botany department, Professor Elaine Ingham stepped into a potential biotech Chernobyl. One of her graduate students discovered that all the wheat plants they had been growing in jars had been turned to brown mush, a result of exposure to an engineered strain of Klebsiella planticola, a common soil bacteria. The engineered K planticola was designed to be a miracle product to decompose plant stubble and debris and to break down such for fertilizers, sludge and alcohol.

Professor Ingham saw the extreme danger presented if K planticola had escaped into the wild. (1) "That would have been the end of all terrestrial plants...it would have been dispersed any time a bird moved it to another field." she noted, even as the EPA had already approved K planticola as safe and ready for deployment. The monster germ was reluctantly shelved, Ingham and her graduate student were politically removed and the incident covered up.

Hydrogen fuel cells currently lack long term viability and require extremely scarce platinum. If hydrogen can be created (and distributed on a large scale) it might have a role in mitigating the end of the oil age.

whether built for bus rapid transit or light rail, can be used by vehicles powered by a variety of fuels. The capacity of the proposed bicycle and pedestrian facilities can accommodate substantial growth in nonmotorized transportation demand. It is likely that the proposed CRC infrastructure could readily accommodate or adapt to the transition to substitute fuel vehicles, higher than projected growth in non-motorized modes, and higher growth in transit demand.
There is substantial uncertainty regarding the timing of peak oil, the future availability of substitute fuels and technology, and the effects of peak oil on transportation. It is reasonable, however, to conclude that the CRC project can be relatively prepared, at the project level, to address reasonably foreseeable impacts associated with peak oil, and to reduce the project's incremental adverse impact.

P-090-025

rebuttal: If the CRC DEIS cannot even acknowledge the substantial increases in oil prices during the preparation of this document, then claims that the project will be able to address Peak Oil are ludicrous beyond language.

Outside the purview of CRC, numerous other measures will influence the timing and impact of peak oil at the global and local scale. These other actions include national and international energy policies, international relations, fuel and transportation taxes and fees, alternative fuel and technology research and development, agricultural policy and practices, local land use regulations, and other measures.

4. Affected Environment

4.1 Introduction

Because the supply and distribution of petroleum (Washington's and Oregon's primary energy source in general, and especially for the transportation sector) is regulated and distributed at the national and state levels, the affected environment is broadly inclusive of the U.S., Washington, and Oregon. This section provides a brief and general description of:

- The existing use and demand for energy resources in the nation and region.
- The present energy use for transportation.
- The available and forecasted supply of energy.

Because gasoline and diesel are the primary energy sources for the transportation sector,
this discussion provides general information on several energy sources, but focuses on the supply and demand of energy derived from petroleum-based fuel sources. Unless specifically defined otherwise, energy use refers to energy originating from crude oil products since energy derived from these sources generally account for over 95 percent of the total energy demand for the transportation sector.

4.2 National Energy Supply and Demand

The USDOE prepares annual energy outlook reports with projections into the future (USDOE 2007a). The Annual Energy Outlook analyzes trends in energy supply and demand worldwide with linkages to projected performance of the U.S. economy and future public policy decisions. The most recent report analyzes historical energy use beginning in 1980 and provides supply and demand forecasts to 2030 (USDOE 2007a). Energy supply forecasts are largely based on international oil markets, and national energy demand projections are organized by delivered energy sources and use sectors.

4.2.1 National Energy Supply

The national supply of petroleum largely depends on international factors. The majority

P-090-025

of oil suppliers are currently at or near production capacity, with the exception of OPEC, who is the largest contributor to the international supply of petroleum. Since its inception in 1960, OPEC has historically had a substantial role in the international and U.S. petroleum supply. In general, when the world oil price is low (price often tracks supply), OPEC curtails supply, and when the price is high, OPEC increases production. **In 2030, 66 percent of the U.S. petroleum supply is expected to be imported from international oil markets including OPEC members and other countries in the Far East, Caribbean, Europe and North America (other than the U.S.). Of this 66 percent, 37 percent is expected to originate from OPEC suppliers (USDOE 2007a).**

Rebuttal: The US already gets about two-thirds of its oil supply from outside the US. Since most of the known oil in the US has already been extracted, it is obvious that by 2030 nearly all US oil consumption is likely to be bought (or stolen via military power) from other countries. The only way that the ratio of foreign oil could remain relatively constant past the global peak is to begin to use much less oil, but that would force a substantial reduction in travel demand, which in turn means that a 12 lane bridge across the Columbia River would not be needed.

Interstate 5 Columbia River Crossing
Energy Technical Report
Affected Environment
4-2 May 2008

Historically, world oil prices have varied considerably and are expected to continue to exhibit high fluctuations as a result of political instability, access restrictions, and a reassessment of OPEC producers' ability to influence prices during periods of volatility. As a result, the 2030 national supply of petroleum could vary substantially depending on world oil prices. Due to global political and economic uncertainties, **the USDOE Annual Energy Outlook world oil prices in 2030 were forecasted for three scenarios: "High Price," "Reference Price," and "Low Price" with the cost of oil at 100, 59, and 36 dollars per barrel, respectively (in 2005 dollars). In November 2006 the price of crude oil was about 60 dollars per barrel. One year later it had risen to between 90 and 100 dollars per barrel (2007 dollars). Depending on the world oil prices, the 2030 projections for petroleum imports ranged from 13.4 million barrels per day for the High Price scenario, 17.7 million barrels per day for the Reference Price, and 20.8 million barrels per day for the Low Price scenario.**

Rebuttal: The 100 dollar a barrel price was reached four months before the publication of the DEIS, not in the year 2030. Therefore, the traffic analysis for the CRC needs to be redone to factor in geological and financial reality - the end of cheap oil is here (regardless of the precise timing of Peak Oil).

The following discussions on national and local energy supply

P-090-025

and demand are based on the Reference Price world oil prices.

4.2.2 National Energy Demand

The national demand for energy will depend on trends in population, economic activity, energy prices (which are reliant on the factors affecting the national supply described above), and the adoption and implementation of technology. In general, the energy consumption per capita is expected to increase 0.3 percent annually through 2030 primarily as a result of strong economic growth (USDOE 2007a). However, the nation's economy is becoming less reliant on energy as a result of energy efficient technologies and faster growth in less energy-intensive industries.

USDOE's annual energy outlook organizes national energy demand forecasts in 2030 by delivered energy source (liquid fuels/petroleum, natural gas, coal, electricity and renewables) and use sectors (residential, commercial, industrial, and transportation). According to the USDOE, the delivered energy use from all sources is expected to increase from 100.19 quadrillion Btu in 2005 to 131.16 quadrillion Btu in 2030, equating to annual demand growth rate of 1.1 percent (USDOE 2007d). **Energy from liquid fuels and other petroleum products is expected to account for the greatest share of energy demand (approximately 40 percent) with a growth rate of approximately 1 percent.**

rebuttal: increase in petroleum based (and derived) liquid fuels are not going to be able to continue to increase on the Peak Oil downslope.

The energy demand from renewable sources is expected to have the highest growth rate (2.2 percent from biomass and 2.6 percent from other sources for a combined growth rate of 2.3 percent), but will continue to account for the smallest overall share of energy demand in 2030 (4.2 percent). Exhibit 4-1 summarizes the national demand for energy in 2005 by energy source with projections out to 2030.

P-090-026

Peak Asphalt

http://www.usatoday.com/printedition/news/20080606/1a_bottomstrip06_dom.art.htm

Oil prices seep into asphalt costs, detour road work

Repair projects are a blow to budgets
By Judy Keen
USA TODAY

P-090-026

Please see response to P-090-001.

P-090-026

CHICAGO — Fewer roads will be repaved this summer, thanks to soaring prices of oil-based asphalt.

Some states, cities and counties say their road-repair budgets didn't anticipate asphalt prices that are up 25.9% from a year ago, so they're being forced to delay projects.

"We will do what patching we can, but this will truly, truly be a devastating blow to the infrastructure," says Shirlee Leighton, a county commissioner in Lake County, S.D., where a 5-mile repaving project was postponed after bids came in $79,000-$162,000 higher than the $442,000 budget.

The mix used to resurface roads consists of gravel and sand held together with a binder called liquid asphalt, which is made from crude oil. As oil prices rise, so does the cost of asphalt, says Don Wessel of Poten & Partners, a consulting firm that publishes Asphalt Weekly Monitor. "Prices are the highest I've seen in many, many, many years," he says. "The concern is that they will go up considerably."

Increases in the cost of diesel fuel used to transport, heat and lay asphalt are adding to the sticker shock, too, creating headaches across the USA:

•Larimer County, Colo., would like to resurface 16-20 miles of its 450 miles of paved roads each year. "This year, we'll be lucky to do seven miles," says road and bridge director Dale Miller.

•Paul Degges, chief engineer for the Tennessee Department of Transportation, will resurface 1,600 miles of state highway this year, well short of his 2,500-mile target. "Since my budget is not growing and costs are up, we're doing less paving," he says.

•A few paved roads in Hall County, Neb., will revert to gravel surfaces, says public works director Casey Sherlock. "At some point, they'll be potholed so bad we won't be able to keep patching them." He had hoped to resurface 6-7 miles of road this spring and could afford only 2 miles.

•In Washington County, Md., acting deputy public works director Robert Slocum is using alternative treatments requiring less asphalt. The result: More miles are being treated with less asphalt, but "ride quality" can be compromised.

•Snohomish County, Wash., pays 17% more for asphalt than a year ago, says county engineer Owen Carter. It's pooling funds with four cities to get a better price.

•The Grand Traverse County (Mich.) Road Commission plans to bid out 30 miles of resurfacing before a bond issue of up to $4 million is finalized to lock in prices before they go even higher, Road Commission manager Mary Gillis says.

Ken Simonson, chief economist for Associated General Contractors of America, says the asphalt-price squeeze exacerbates the USA's infrastructure problems and "may force Congress and the states to find more money for roads sooner than they would have otherwise."

Page 1A

P-090-027

Spy Roads: Civil Liberties vs. Transportation Surveillance

European Parliament – Luxembourg, 6 January 1998 – Directorate General for Research
Scientific and Technological Options Assessment – An Appraisal of Technologies of Political Control
archived at http://www.cryptome.org/stoa-atpc.htm

52

P-090-027

Please see response to P-090-001.

P-090-027

Vehicle Recognition Systems

... A huge range of surveillance technologies has evolved, including the night vision goggles discussed in 3 above; parabolic microphones to detect conversations over a kilometre away (see Fig. 18); laser versions marketed by the German company PK Electronic, can pick up any conversation from a closed window in line of sight; the Danish Jai stroboscopic camera (Fig. 19) which can take hundreds of pictures in a matter of seconds and individually photograph all the participants in a demonstration or March; and the automatic vehicle recognition systems which can identify a car number plate then track the car around a city using a computerised geographic information system. (Fig.20) Such systems are now commercially available, for example, the Talon system introduced in 1994 by UK company Racal at a price of £2000 per unit. The system is trained to recognise number plates based on neural network technology developed by Cambridge Neurodynamics, and can see both night and day. Initially it has been used for traffic monitoring but its function has been adapted in recent years to cover security surveillance and has been incorporated in the "ring of steel" around London. The system can then record all the vehicles that entered or left the cordon on a particular day.

Such surveillance systems raise significant issues of accountability particularly when transferred to authoritarian regimes. The cameras ... in Tiananmen Square were sold as advanced traffic control systems by Siemens Plessey. Yet after the 1989 massacre of students, there followed a witch hunt when the authorities tortured and interrogated thousands in an effort to ferret out the subversives. The Scoot surveillance system with USA made Pelco camera were used to faithfully record the protests. the images were repeatedly broadcast over Chinese television offering a reward for information, with the result that nearly all the transgressors were identified. Again **democratic accountability is only the criterion which distinguishes a modern traffic control system from an advanced dissident capture technology.** Foreign companies are exporting traffic control systems to Lhasa in Tibet, yet Lhasa does not as yet have any traffic control problems. **The problem here may be a culpable lack of imagination.**

"that [surveillance] capability at any time could be turned around on the American people and no American would have any privacy left, such [is] the capability to monitor everything: telephone conversations, telegrams, it doesn't matter. There would be no place to hide. If this government ever became a tyranny, **if a dictator ever took charge in this country, the technological capacity that the intelligence community has given the government could enable it to impose total tyranny,** and there would be no way to fight back, because the most careful effort to combine together in resistance to the government, no matter how privately it was done, is within the reach of the government to know. Such is the capability of this technology ...

"I don't want to see this country ever go across the bridge. I know the capacity that is there to make tyranny total in America, and we must see to it that this agency [NSA] and all agencies that possess this technology operate within the law and under proper supervision, so that we never cross over that abyss. That is the abyss from which there is no return."

-- Senator Frank Church (D-Idaho), 1975, quoted in James Bamford, "The Puzzle Palace"

P-090-027

"If this were a dictatorship, it would be a heck of a lot easier, just so long as I'm the dictator."

- George W. Bush, December 18, 2000

Maryland's highway surveillance systems

www.baltimoresun.com/news/local/bal-te.md.reader03apr03,0,73671.story?coll=bal-home-headlines

Cameras scan license plates for stolen cars

By Melissa Harris

Sun reporter

Originally published April 3, 2006

As her marked car crawled through the parking lot, Detective Kelly Tibbs' new laptop beeped like a supermarket scanner. Two cameras, positioned like crab eyes on the cruiser's roof, snapped digital pictures of hundreds of license plates, and with each beep, the laptop checked the images against an FBI list of stolen cars.

Such cameras - called Mobile Plate Hunters - are replacing the laborious eyeball-and-keystroke method of checking for stolen cars, letting busy officers rely instead on an automated scan that takes less than a second.

Already in widespread use in London and Italy, automatic number plate recognition is a technology on the verge of exploding in the Baltimore-Washington area, fueled in places by funds from the federal Department of Homeland Security.

Howard and Anne Arundel counties deploy one each. Prince George's County and the District of Columbia have ordered more than a dozen of the cameras, which have been in use in Prince George's since August and the district since January.

Baltimore police are soliciting bids for a system that would work with the city's existing network of street surveillance cameras. And as early as this summer's vacation rush, Maryland Transportation Authority Police hope to add the cameras to the Bay Bridge as part of a pilot project with the U.S. Department of Justice.

Stationary cameras, such as those envisioned for Baltimore and the Bay Bridge, could alert nearby officers if an offending vehicle - one bearing a license plate registered to a wanted criminal, suspected terrorist or car thief - goes past.

"The uses are as limitless as your imagination," said Lt. John McKissick, director of Howard County's emergency preparedness division. "We're just in the infancy of this project, but already it saves us money and manpower."

Although proponents say the technology eventually will deny all but the most clever of criminals access to roads, privacy advocates warn that the plate hunters mark another step toward a society in which police can track a person's every move.

"Normally, your license plate number only becomes relevant when you're involved in an accident, pulled over by police or when your car is stolen," said Marc Rotenberg, executive director of the Electronic Privacy Information Center. "This technology changes that. ... It's a new form of surveillance."

P-090-027

The technology, which Tibbs demonstrated in the parking lot of Howard County police headquarters, was developed in Italy and used by the Italian postal service. Postcards would zip along a conveyer belt, the cameras would read them, and the computer would sort them.

"The engineers in Italy realized that if they could read Bulgarian postcards handwritten with pencil at high speeds, license plates would be a piece of cake," said Mark Windover, president of Remington-Elsag, a partnership between the U.S. gun manufacturer and the Italian postal-technology company, which sold a plate hunter to Howard County for $26,0000.

The plate hunters use infrared light to "read" as many as 900 license plates per minute zooming by at speeds of up to 120 miles per hour in the rain or dark, McKissick said.

Infrared light illuminates the plate, the camera snaps a picture and the computer converts it into digital characters - ABC 123, for example - using optical character recognition. Strapping two cameras to a roof allows the system to go through a mall parking lot, checking plates on both sides of the police car.

Each night, local police departments download FBI data to in-car laptops. When a scanned license plate matches one in the FBI database, the computer triggers an alarm, and the screen blinks red "alert" signs. Before officers can make an arrest, they must check the accuracy of the alert because the database lags a day behind, and the system does not distinguish among states.

"In one block in Washington, I recovered six sets of stolen tags and a stolen motorcycle using the reader," said state police Detective Sgt. George Jacobs, assistant commander of the Washington-area vehicle enforcement unit. "It's just amazing that there are areas out there like that. It's a great tool because manually, it would have taken me several hours to type in the tags."

Though the primary purpose of the technology is to recover stolen vehicles, Howard County and other jurisdictions plan to eventually use the cameras for surveillance.

McKissick said he envisions placing cameras around potential terrorist targets and linking them to neighboring counties' systems. For instance, if the same license plate passes emergency communications towers in Howard, Baltimore and Anne Arundel counties, the system could alert police in all three areas.

The technology also could be used to enforce laws or court orders that keep sexual predators away from schools or domestic abusers away from spouses.

Already, when Tibbs learns of an Amber Alert, she can enter the tag number manually into her laptop and search for the car. The system also is linked to the FBI's "violent gangs and terrorism organization file," though Howard County is not yet using it because the plate hunter is still new to the department, McKissick said.

"We want to be able to look at offenders with another set of eyes," said Chief Gary W. McLhinney of the Maryland Transportation Authority Police, which is working to secure a pilot program for the technology at the Bay Bridge.

McKissick and other officers dismiss concerns that the cameras invade drivers' privacy. McKissick said the machine is "strictly a numbers game," enabling officers to do more of what they already do.

Jacobs said the system does not discriminate and that the computer does not list a tag owner's information unless it sounds an alert on the car. Without the computer, officers choose which license plates they check, lacking the time to manually enter every one they see.

"There can be no discrimination," Jacobs said, "because the machine picks and runs every tag it sees."

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P-090-027 Britain's auto Panopticon

http://news.independent.co.uk/uk/transport/article334686.ece
Britain will be first country to monitor every car journey
From 2006 Britain will be the first country where every journey by every car will be monitored
By Steve Connor, Science Editor
Published: 22 December 2005

Britain is to become the first country in the world where the movements of all vehicles on the roads are recorded. A new national surveillance system will hold the records for at least two years.

Using a network of cameras that can automatically read every passing number plate, the plan is to build a huge database of vehicle movements so that the police and security services can analyse any journey a driver has made over several years.

The network will incorporate thousands of existing CCTV cameras which are being converted to read number plates automatically night and day to provide 24/7 coverage of all motorways and main roads, as well as towns, cities, ports and petrol-station forecourts.

By next March a central database installed alongside the Police National Computer in Hendon, north London, will store the details of 35 million number-plate "reads" per day. These will include time, date and precise location, with camera sites monitored by global positioning satellites.

Already there are plans to extend the database by increasing the storage period to five years and by linking thousands of additional cameras so that details of up to 100 million number plates can be fed each day into the central databank.

Senior police officers have described the surveillance network as possibly the biggest advance in the technology of crime detection and prevention since the introduction of DNA fingerprinting.

But others concerned about civil liberties will be worried that the movements of millions of law-abiding people will soon be routinely recorded and kept on a central computer database for years.

The new national data centre of vehicle movements will form the basis of a sophisticated surveillance tool that lies at the heart of an operation designed to drive criminals off the road.

In the process, the data centre will provide unrivalled opportunities to gather intelligence data on the movements and associations of organised gangs and terrorist suspects whenever they use cars, vans or motorcycles.

The scheme is being orchestrated by the Association of Chief Police Officers (Acpo) and has the full backing of ministers who have sanctioned the spending of £24m this year on equipment.

More than 50 local authorities have signed agreements to allow the police to convert thousands of existing traffic cameras so they can read number plates automatically. The data will then be transmitted to Hendon via a secure police communications network.

Chief constables are also on the verge of brokering agreements with the Highways Agency, supermarkets and petrol station owners to incorporate their own CCTV cameras into the network. In addition to cross-checking each number plate against stolen and suspect vehicles held on the Police National Computer, the national data centre will also check whether each vehicle is lawfully licensed, insured and has a valid MoT test certificate.

"Every time you make a car journey already, you'll be on CCTV somewhere. The difference is that, in future, the car's index plates will be read as well," said Frank Whiteley, Chief

P-090-027

Constable of Hertfordshire and chairman of the Acpo steering committee on automatic number plate recognition (ANPR).

"What the data centre should be able to tell you is where a vehicle was in the past and where it is now, whether it was or wasn't at a particular location, and the routes taken to and from those crime scenes. Particularly important are associated vehicles," Mr Whiteley said.

The term "associated vehicles" means analysing convoys of cars, vans or trucks to see who is driving alongside a vehicle that is already known to be of interest to the police. Criminals, for instance, will drive somewhere in a lawful vehicle, steal a car and then drive back in convoy to commit further crimes "You're not necessarily interested in the stolen vehicle. You're interested in what's moving with the stolen vehicle," Mr Whiteley explained.

According to a strategy document drawn up by Acpo, the national data centre in Hendon will be at the heart of a surveillance operation that should deny criminals the use of the roads.

"The intention is to create a comprehensive ANPR camera and reader infrastructure across the country to stop displacement of crime from area to area and to allow a comprehensive picture of vehicle movements to be captured," the Acpo strategy says.

"This development forms the basis of a 24/7 vehicle movement database that will revolutionise arrest, intelligence and crime investigation opportunities on a national basis," it says.

Mr Whiteley said MI5 will also use the database. "Clearly there are values for this in counter-terrorism," he said.

"The security services will use it for purposes that I frankly don't have access to. It's part of public protection. If the security services did not have access to this, we'd be negligent."

http://news.com.com/E-tracking,+coming+to+a+DMV+near+you/2010-1071_3-5980979.html

DECLAN MCCULLAGH, CNET, December 5, 2005

Trust federal bureaucrats to take a good idea and transform it into a frightening proposal to track Americans wherever they drive.

The U.S. Department of Transportation has been handing millions of dollars to state governments for GPS-tracking pilot projects designed to track vehicles wherever they go. So far, Washington state and Oregon have received fat federal checks to figure out how to levy these "mileage-based road user fees."

Now electronic tracking and taxing may be coming to a DMV near you. The Office of Transportation Policy Studies, part of the Federal Highway Administration, is about to announce another round of grants totaling some $11 million. A spokeswoman on Friday said the office is "shooting for the end of the year" for the announcement, and more money is expected for GPS (Global Positioning System) tracking efforts.

In principle, the idea of what bureaucrats like to call "value pricing" for cars makes sound economic sense.

No policy bans police from automatically sending out speeding tickets based on what the GPS data say.

Airlines and hotels have long charged less for off-peak use. Toll roads would be more efficient--in particular, less congested--if they could follow the same model and charge virtually nothing in the middle of the night but high prices during rush hour.

That price structure would encourage drivers to take public transportation, use alternate routes, or leave earlier or later in the day.

P-090-027

The problem, though, is that these "road user fee" systems are being designed and built in a way that strips drivers of their privacy and invites constant surveillance by police, the FBI and the Department of Homeland Security.

Zero privacy protections

Details of the tracking systems vary. But the general idea is that a small GPS device, which knows its location by receiving satellite signals, is placed inside the vehicle.

Some GPS trackers constantly communicate their location back to the state DMV, while others record the location information for later retrieval. (In the Oregon pilot project, it's beamed out wirelessly when the driver pulls into a gas station.)

The problem, though, is that no privacy protections exist. No restrictions prevent police from continually monitoring, without a court order, the whereabouts of every vehicle on the road.

No rule prohibits that massive database of GPS trails from being subpoenaed by curious divorce attorneys, or handed to insurance companies that might raise rates for someone who spent too much time at a neighborhood bar. No policy bans police from automatically sending out speeding tickets based on what the GPS data say.

The Fourth Amendment provides no protection. The U.S. Supreme Court said in two cases, U.S. v. Knotts and U.S. v. Karo, that Americans have no reasonable expectation of privacy when they're driving on a public street.

The PR offensive

Even more shocking are additional ideas that bureaucrats are hatching. A report prepared by a Transportation Department-funded program in Washington state says the GPS bugs must be made "tamper proof" and the vehicle should be disabled if the bugs are disconnected.

"This can be achieved by building in connections to the vehicle ignition circuit so that failure to receive a moving GPS signal after some default period of vehicle operation indicates attempts to defeat the GPS antenna," the report says.

It doesn't mention the worrisome scenario of someone driving a vehicle with a broken GPS bug--and an engine that suddenly quits half an hour later. But it does outline a public relations strategy (with "press releases and/or editorials" at a "very early stage") to persuade the American public that this kind of contraption would be, contrary to common sense, in their best interest.

One study prepared for the Transportation Department predicts a PR success. "Less than 7 percent of the respondents expressed concerns about recording their vehicle's movements," it says.

That whiff of victory, coupled with a windfall of new GPS-enabled tax dollars, has emboldened DMV bureaucrats. A proposal from the Oregon DMV, also funded by the Transportation Department, says that such a tracking system should be mandatory for all "newly purchased vehicles and newly registered vehicles."

The sad reality is that there are ways to perform "value pricing" for roads while preserving anonymity. You could pay cash for prepaid travel cards, like store gift cards, that would be debited when read by roadside sensors. Computer scientists have long known how to create electronic wallets--using a technique called blind signatures--that can be debited without privacy concerns.

The Transportation Department could require privacy-protective features when handing out grants for pilot projects that may eventually become mandatory. It's now even more important because a new U.S. law ups the size of the grants; the U.K. is planning GPS tracking and per-mile fees ranging between 3 cents and $2.

P-090-027

We'll see. But given the privacy hostility that the Transportation Department and state DMVs have demonstrated so far, don't be too optimistic.

http://news.com.com/2102-1071_3-5980979.html?tag=st.util.print

www.globetechnology.com/servlet/ArticleNews/TPStory/LAC/20051128/SMARTCARS28/TPTechnology/
BIG BROTHER COMING UNDER YOUR CAR HOOD

JEFF GRAY, GLOVE AND MAIL, CA- It's the last thing many motorists would want -- a permanent, electronic back-seat driver, forcefully reminding them not to speed. But Transport Canada is road-testing cutting-edge devices that use global positioning satellite technology and a digital speed-limit map to know when a driver is speeding, and to try to make them stop. When a driver hits a certain percentage above the posted speed limit, the device kicks in and makes it difficult to press the accelerator. While the idea appeals to some road-safety experts, even the researcher in charge of the project admits many drivers -- some of whom have shown fierce resistance to photo-radar and red-light cameras -- may balk at the science-fiction scenario of a machine forcing them to apply the brakes. . . In Europe, proponents have said that the technology should be mandatory in all vehicles or that insurance companies might offer discounts to drivers who use it.

BOSTON HERALD - Over the coming year, the T will install automated fare collection equipment at every subway station and on every bus, allowing riders to pay easily with taps of special smart cards in their names. But each transaction with the plastic Charlie Cards will be recorded electronically, creating a record of where users were at a particular time on a particular day. Those records could be subpoenaed by cops, courts or even lawyers in civil cases. "The bottom line is that like other developments with consumer products and technology, the convenience does have a flip side. It's convenience versus having the government be able to track you," said privacy expert Eric Gertler. . .

The new automated fare system will record where a passenger boards the system and at what time. The system won't capture any data on the rider's destination. The information will be archived for a year and a half to two years before it's erased. . .

The Massachusetts Turnpike Authority has for years recorded where and when users of the Fas tLane electronic transponders get on and off the toll highway. Unlike the MBTA, the Turnpike's privacy protections barring outside release of the data without a subpoena are written into state law. "On a fairly regular basis we receive subpoena requests both civil and criminal," Pike spokesman Tom Farmer said.
http://news.bostonherald.com/localRegional/view.bg?articleid=118780&format=text

http://news.independent.co.uk/uk/transport/story.jsp?story=644303
Satellite toll plan to make drivers pay by the mile
Darling orders nationwide road pricing. Charge of £1.34 a mile on busiest roads
By Francis Elliott, Deputy Political Editor
05 June 2005

British motorists face paying a new charge for every mile they drive in a revolutionary scheme to be introduced within two years.

P-090-027

Drivers will pay according to when and how far they travel throughout the country's road network under proposals being developed by the Government.

Alistair Darling, the Secretary of State for Transport, revealed that pilot areas will be selected in just 24 months' time as he made clear his determination to press ahead with a national road pricing scheme.

Each of Britain's 24 million vehicles would be tracked by satellite if a variable "pay-as-you-drive" charge replaces the current road tax.

In an interview with The Independent on Sunday, Mr Darling warned that unless action is taken now, the country "could face gridlock" within two decades.

Official research suggests national road pricing could increase the capacity of Britain's network by as much as 40 per cent at a stroke, he said.

The rapid uptake of satellite navigational technology in cars is helping to usher in the new "pay-as-you-drive" charge much sooner than had been expected. Figures contained in a government feasibility study have suggested motorists could pay up to £1.34 for each mile they travel during peak hours on the most congested roads.

Although a fully operational national scheme is still considered to be a decade away, Mr Darling said local schemes could be up and running within five years. Manchester is considered a front-runner, with local authorities in the Midlands and London also pressing to be considered for a £2.5bn central fund to introduce the change.

Most of the necessary technology already exists. Lorries will be tracked by satellite and charged accordingly from 2007. The main obstacle to constructing a scheme to track Britain's 24 million private vehicles is public opinion, and Mr Darling is determined to start making the case now.

"You could dance around this for years but every year the problem is getting worse," he said.

"We have got to do everything we can during the course of this Parliament to decide whether or not we go with road pricing. Something of this magnitude will span several parliaments and you need 'buy-in' not just from political parties but also from the general public.

"Drivers have got to see that they benefit," he said, adding that one of the "weaknesses" of the congestion charging scheme introduced in the capital by the Mayor of London, Ken Livingstone, was that it delivered a "general benefit not a particular benefit". Motorists could feel they are paying a penalty to support buses they do not use.

The national road-pricing scheme, by contrast, has got to work so there's "something in it for me", said Mr Darling in advance of a keynote speech on the issue this Thursday.

Despite his insistence that the scheme would lead to no overall increase in the level of taxation as road taxes and fuel duties are reduced or abolished, it is bound to prompt fresh claims that Labour is waging a "war on motorists".

Some campaigners, meanwhile, are pressing Mr Darling to introduce new levies on individual roads immediately, using existing microwave technology or tolls. But that would force traffic on to quieter roads while entrenching opposition to a national scheme, ministers believe.

However, new and expanded roads are likely to see innovations such as car-sharing lanes, available to single drivers only if they pay a premium.

Geoslavery: GPS and technological tyranny

www.ur.ku.edu/News/03N/MarchNews/March5/dobson.html
March 5, 2003
KU researcher warns against potential threat of 'geoslavery'

P-090-027

LAWRENCE -- Jerome Dobson wants to make sure his field of research doesn't aid the greatest threat to personal freedom.

As a pioneer of geographic information systems (GIS), Dobson, a researcher at the Kansas Applied Remote Sensing Program at the University of Kansas, helped develop the technology that now is commonplace in government, business and practically every aspect of modern life.

Since 1975, Dobson has used GIS for a number of applications -- from conducting environmental analyses to identifying populations at risk of terrorism and natural disasters -- by combining data sets such as detailed population counts of every country in the world, terrain and nighttime lights interpreted from satellite images, road networks and elevations. Dobson, who is a professor of geography at KU, also is president of the American Geographical Society.

Unfortunately, the same technology that has so many beneficial uses also has the potential to create a highly sophisticated form of slavery, or "geoslavery," as Dobson calls it. What worries Dobson is that GIS technology easily could be used not only to spy on people but to control them as well.

"It concerns me that something I thought was wonderful has a downside that may lead to geoslavery -- the greatest threat to freedom we've ever experienced in human history," he said.

By combining GIS technology with a global positioning system (GPS) and a radio transmitter and receiver, someone easily can monitor your movements with or without your knowledge. Add to that a transponder -- either implanted into a person or in the form of a bracelet -- that sends an electric shock any time you step out of line, and that person actually can control your movements from a distance.

Sound like something from a bad sci-fi movie? Actually, several products currently on the market make this scenario possible.

"In many ways that's what we're doing with prisoners right now, but they've been through a legal process," he said.

In fact, many of the existing products are marketed to parents as a way to protect their children from kidnappers. Dobson, however, said parents should think twice before using such products.

"A lot of people think this is a way to protect their children," he said. "But most kidnappers won't have any compunction about cutting the child to remove an implant or bracelet."

Furthermore, these products rely on wireless networks, which are notoriously easy for hackers to break into, potentially turning the very products meant to protect children into fodder for tech-savvy child predators.

Dobson outlined the dangers of geoslavery in an article that appears in the most recent issue of the Institute of Electrical and Electronics Engineers' Technology and Society magazine. Peter F. Fisher, editor of the International Journal of Geographic Information Science, co-wrote the paper with Dobson. More than 375,000 scientists read the IEEE magazine.

One of the greatest dangers of geoslavery is that it doesn't apply just to governments. For example, individuals could use the technology to perpetuate various forms of slavery, from child laborers to sex slaves to a simple case of someone controlling the whereabouts of his or her spouse, Dobson said.

"Many people have concerns today about privacy but they haven't put all the pieces together and realized this means someone can actually control them -- not just know about them, but control them," Dobson said.

As the price of these products gets cheaper and cheaper, the likelihood rises that the technology will be abused, he said. To prevent this, Dobson's paper outlines a number of actions that should be taken, including revising national and international laws on incarceration, slavery,

P-090-027

stalking and branding, and developing encryption systems that prevent criminals or countries with bad human rights records from accessing GPS signals.

Still, the first step is making people aware of the very real threat that geoslavery poses. The potential for harm is even greater in less developed nations without strong traditions of personal freedom, he said.

"We need a national dialogue on this if we're going to go into something so different from our traditional values of privacy and freedom," Dobson said. "We need to think about it very carefully and decide if this is a direction we as a society want to go."

Dobson said he doesn't consider himself a crusader. Instead, he is a scientist who is working diligently to ensure that people really understand the good and bad sides of the technology he helped create.

"There certainly are many, many good uses for the technology -- that's not the issue -- the issue is that it can be so easily misused," he said. "My role as a university professor is to alert people and make sure there is an informed debate."

http://www.smartmobs.com/archive/2003/03/12/gps_spawns_fear.html

CNN reports on Jerome Dobson's concerns that GPS technology may be hazardous to personal liberties. Dobson is president of the American Geographical Society. "Geoslavery" is a good word for describing one of the biggest downsides to smartmob technology.

http://charlotte.creativeloafing.com/2004-09-29/news_cover.html
NEWS COVER 09.29.04
Big Brother In Your Car
Futuristic hi-tech could save your life -- and raid your privacy
BY TARA SERVATIUS

Deep inside the United States Department of Transportation, Big Brother is rearing his head. On the third floor of the USDOT building in the heart of Washington, DC, a shadowy government agency that doesn't respond to public inquiries about its activities is coordinating a plan to use monitoring devices to catalogue the movements of every American driver.

Most people have probably never heard of the agency, called the Intelligent Transportation Systems Joint Program Office. And they haven't heard of its plans to add another dimension to our national road system, one that uses tracking and sensor technology to erase the lines between cars, the road and the government transportation management centers from which every aspect of transportation will be observed and managed.

For 13 years, a powerful group of car manufacturers, technology companies and government interests has fought to bring this system to life. They envision a future in which massive databases will track the comings and goings of everyone who travels by car or mass transit. The only way for people to evade the national transportation tracking system they're creating will be to travel on foot. Drive your car, and your every movement could be recorded and archived. The federal government will know the exact route you drove to work, how many times you braked along the way, the precise moment you arrived -- and that every other Tuesday you opt to ride the bus.

They'll know you're due for a transmission repair and that you've neglected to fix the ever-widening crack that resulted from a pebble dinging your windshield.

P-090-027

Once the system is brought to life, both the corporations and the government stand to reap billions in revenues. Companies plan to use the technology to sell endless user services and upgrades to drivers. For governments, tracking cars' movements means the ability to tax drivers for their driving habits, and ultimately to use a punitive tax system to control where they drive and when, a practice USDOT documents predict will be common throughout the country by 2022.

This system the government and its corporate partners are striving to create goes by many names, including the information superhighway and the Integrated Network of Transportation information, or INTI. Reams of federal documents spell out the details of how it will operate.

Despite this, it remains one of the federal government's best-kept secrets. Virtually nothing has been reported about it in the media. None of the experts at the privacy rights groups Creative Loafing talked to, including the ACLU, the Consumers Union and the Privacy Rights Clearinghouse, had ever heard of the INTI. Nor had they heard of the voluminous federal documents that spell out, in eerie futuristic tones, what data the system will collect and how it will impact drivers' daily lives.

Buried inside two key federal documents lies a chilling cookbook for a Big Brother-style transportation-monitoring system. None of the privacy experts we talked to was aware of a 2002 USDOT document called the "National Intelligent Transportation Systems Program Plan: A Ten-Year Vision" or the "National ITS Architecture ITS Vision Statement," published by the Federal Highway Administration in 2003.

What's more, no one we talked to was aware of just how far the USDOT has come in developing the base technology necessary to bring the system to life.

More than $4 billion in federal tax dollars has already been spent to lay the foundation for this system. Some of the technologies it will use to track our movements are already familiar to the public, like the GPS technology OnStar already used to pinpoint the location of its subscribers. Others are currently being developed by the USDOT and its sub-agencies.

Five technology companies hired by the USDOT to develop the transceivers, or "on-board units," that will transmit data from your car to the system are expected to unveil the first models next spring. By 2010, automakers hope to start installing them in cars. The goal is to equip 57 million vehicles by 2015.

Once the devices are installed, the technology will allow cars to talk to each other in real time, transmitting information about weather, dangerous road conditions ahead and even warning drivers instantaneously of an impending collision. When used in combination with GPS technology already being installed in millions of cars, the INTI will be able to transmit real-time information about where your car is and where you've been.

Though Joint Project Office officials refused to talk to Creative Loafing about the next step in their plan, one official defined it simply in a presentation before the National Research Council in January.

"The concept," said Bill Jones, Technical Director of the Joint Office, "is that vehicle manufacturers will install a communications device on the vehicle starting at some future date, and equipment will be installed on the nation's transportation system to allow all vehicles to communicate with the infrastructure."

"The whole idea here is that we would capture data from a large number of vehicles," Jones said at another meeting of transportation officials in May. "That data could then be used by public jurisdictions for traffic management purposes and also by private industry, such as DaimlerChrysler, for the services that they wish to provide for their customers."

According to USDOT's 10-year plan, the key "data" the INTI will collect is "the identity and performance of transportation system users."

P-090-027

"It's going to happen," said Jean-Claude Thill, a professor at the University of Buffalo who specializes in transportation and geographic information and who has done research for USDOT. "It's probably going to start in the large metropolitan areas where there's a much larger concentration and more demand for the services that are going to be made available."

With this system, and the fantastic technology it will enable, the government and the auto industry claim they can wipe out all but a fraction of the 42,000 deaths on America's roads by literally intervening between the drivers, cars and the road. But as they careen toward making it a reality, its costs in terms of individual privacy have barely been contemplated.

If the government has its way, these technologies will no longer be optional. They'll be buried deep inside our cars at the auto factory, unremovable by law. If things go as planned, within the next decade these devices will begin transmitting information about us to the government, regardless of whether we want to share it or not.

More chilling still is the fact that Creative Loafing isn't the first to use the "Big Brother" label to describe the system. Even the corporate leaders working to create it refer to it in Orwellian terms. At a workshop for industry and government leaders last year, John Worthington, the President and CEO of TransCore -- one of the companies currently under contract to develop the on-board units USDOT wants to put in your car -- described INTI as "kind of an Orwellian all-singing, all-dancing collector/aggregator/disseminator of transportation information."

This story really begins in 1991, the year Congress established a program to develop and deploy what is now called "Intelligent Transportation Systems," or ITS. At the time, most ITS technology was in its infancy. But even back then, the long-term goal of the federal government and the automobile industry was to develop and deploy a nationwide traffic monitoring system. A transportation technology industry quickly sprang to life over the next decade, feeding off federal money and the corporate demand for wireless technology.

Since 1991, the driving force behind the INTI has been the Washington, DC-based Intelligent Transportation Society of America (ITSA). This powerful group of government and corporate interests has spent tens of millions of dollars lobbying to bring the INTI to life and worked side by side with USDOT and its agencies to create it.

A look at its shockingly broad 500-organization membership base shows just how much clout is behind the push to create the information superhighway. Forty-three of the 50 state Departments of Transportation are members, including the North Carolina DOT. Dozens of transportation departments from large and medium-sized cities, including the Charlotte Area Transit System, are also members. So are most of the key corporate players in the transportation technology industry and America's big three auto manufacturers.

Though the membership of the Board of Directors changes every year with companies cycling on and off, over the last two years, ITSA's board members have included executives from General Motors, DaimlerChrysler, Ford Motor Company, and executives from the technology companies helping to develop the on-board units, including TransCore and Mark IV Industries. The board has also included federal transportation bureaucrats like Jeff Paniati, the Joint Program Office director. ITSA president and CEO Neil Schuster says the bulk of the group's $6 million annual budget comes from its corporate members, money that ITSA then turns around and uses to lobby Congress and the federal government for further development of the INTI.

So why haven't you heard about ITSA or the INTI? Until recently, most of the groundwork necessary to lay the foundation for the system has been highly technical and decidedly unsexy. That's because before industry leaders and government officials could hold the first transceiver in their hands or bury it inside the first automobile, they had to create a uniform language for the system and convince the Federal Communications Commission to set aside enough bandwidth to

P-090-027

contain the massive amount of data a constant conversation between cars, the road and the system would produce.

A half-decade later, with the computer standards 90 percent complete and the bandwidth set aside by the FCC, they're on the brink of a transportation revolution.

To most drivers, the above probably sounds pretty far-fetched. National databases to track our every move? A national network of government-controlled traffic management centers that use wireless technology for traffic surveillance by 2022? But the reality is that much of the technology and infrastructure needed to bring the system to life has already been put in place.

In the old days, if you turned on your windshield wipers, power just went to the wipers. But in the cars of today, a miniature self-contained computer system of sensors and actuators controls the wipers and just about everything else the car does. All that information winds up on something inside your car called a data bus.

"We have the ability to communicate essentially any of the vehicle information that's on that data bus, typically encompassing the state of about 200 sensors and actuators," said Dave Acton, an ITS consultant to General Motors. "Anything that's available on the bus is just content to the system, so you could send anything."

For automakers and tech companies, the databus is a goldmine of information that can be transmitted via imbedded cell phone or GPS technology. This year alone, 2 million cars in General Motors' fleet were equipped with the GPS technology that would enable customers to subscribe to OnStar-type services if they choose. Eventually, says Acton, all cars will likely be equipped with it.

But the same technology installed in GM's fleet is also capable of transmitting the car's location and speed to any government agency or corporate entity that wants it without the driver knowing, whether they subscribe to OnStar-type services or not.

Though government-run transportation centers across the country are not yet collecting the data, Acton predicts they will begin to within the next decade.

Ann Lorscheider agrees. She's the manager of the Metrolina Region Transportation Management center on Tipton Drive in Charlotte.

At the center off Statesville Avenue, traffic management specialists stare at dozens of television screens mounted on a massive wall, watching for accidents or anything out of the ordinary. From their workstations, they surveil 200 interstate miles, including I-77 from the South Carolina state line to US 901 in Iredell and I-85 from the state line into Cabarrus County.

When they need to, they can swivel the cameras mounted along the interstate or zoom in to get a better look at an accident. Sensors in the road constantly dump data back to the center on traffic patterns and speed. A system based on predictive algorithms tells them if a traffic pattern signals a potential problem.

The cameras and the sensors were installed by the state in 2000, at a cost of $41 million. Traffic management centers like the one Lorscheider runs can now be found in just about every major to mid-sized city or region across the country, most constructed in over the last decade or so.

News reports show that over the last five years alone, there has been an explosion in the construction of these centers. During that time, over 100 such centers have opened across the country, part of a boom driven by the USDOT and its sub-agency, the Federal Highway Administration, which has secured funding to help bring the centers to life.

"They're booming," said Lorscheider. "They're all over the place now."

Everywhere they've opened, the centers have decreased response time to accidents and slashed, sometimes by as much as half, the number of law enforcement personnel needed to

P-090-027

respond to accidents and get traffic moving again. Congestion and travel times have also improved.

This all sounds fine and safety-centered. But in the future envisioned by USDOT and ITSA in federal documents, the centers will be far more than a handy congestion management tool. They'll form the very hub of the INTI itself, interacting with regional and national traffic centers and, ultimately, with immense national databases run in partnership with the private sector that will cull data from vehicles, crunch and archive it.

To bring the INTI to life the way the government plans, the system will have to do far more than use GPS technology to transmit where cars have been and what they did along the way. Cars will need to swap information instantaneously with each other and with roadside readers at highway speeds in real time, something today's GPS technology can't do. To solve the problem, the federal government is pushing back the boundaries of wireless technology to create devices that can make the vision possible. Using something called Dedicated Short Range Communications, or DSRC, the transceivers the government is developing would allow cars to carry on simultaneous conversations with each other and with corresponding roadside units, sending messages or warnings throughout the transportation management system instantly.

These "conversations" could prevent collisions or stop drivers from running off the road, while giving transportation managers an instantaneous view of road and weather conditions. With a DSRC transceiver and GPS technology in every car, automakers believe they can wipe out nearly all automobile fatalities in the US. It's a goal they call the Zero Fatalities Vision.

"There is a basic consensus that we have to change the safety paradigm," said Chris Wilson, Vice President of ITS Strategy and Programs at DaimlerChrysler Research and Technology North America, Inc. "Everything we've done up until now -- airbags, seatbelts -- was to mitigate accidents once they occur. Now we're looking to prevent accidents. To do that we need live vehicle-to-vehicle communication and vehicle-to-vehicle infrastructure."

The tantalizing prospect of saving thousands of lives comes with a heavy price. The same technology that will allow cars to talk to each other in real time would also allow the government and ultimately private business to use the INTI to track every move American drivers make -- and profit from it.

This is the dark side of the information superhighway, the one executives and federal bureaucrats don't like to talk about. That's probably because they know it's entirely possible to use the technology the government is developing to prevent fatal collisions without harvesting information from automobiles and archiving it.

For all their talk about saving lives, there's ample evidence that the driving force behind the push to develop the national information superhighway is to profit from the data it collects. Both the corporations and the government -- including the more than 40 state departments of transportation that are members of ITSA -- stand to eventually rake in billions in revenues if they can bring the system to life. (See sidebar, "A Marketer's Dream.")

But first, they must find a way to harvest and archive the data.

That's where the ADUS, or Archived Data User Service, project comes in. For the last five years, while they were laying the foundation for the INTI, USDOT and ITSA have also begun setting standards for the massive databases that will collect and archive information.

According to federal documents, when it's completed, the brain of the INTI will essentially be a string of interconnected regional and national databases, swapping, processing and storing data on our travels it will collect from devices in our cars.

According to the "ITS Vision Statement" the Federal Highway Administration published in 2003, by 2022, each private "travel customer" will have their own "user profile" on the system

P-090-027

that includes regular travel destinations, their route preferences, and any pay-for-service subscriptions they use.

Neil Schuster, president and CEO of ITSA, further clarified that goal in a recent interview with Creative Loafing.

"In fact, when we talk about this, the US government is talking about creating a national database, because where cars are has to go into a database," Schuster said.

Most INTI enthusiasts, like Schuster, insist that the lives potentially saved by this technology are worth giving up some privacy.

"When I get on an airplane everyone in the system knows where I am," said Schuster. "They know which tickets I bought. You could probably go back through United Airlines and find out everywhere I traveled in the last year. Do I worry about that? No. We've decided that airline safety is so important that we're going to put a transponder in every airplane and track it. We know the passenger list of every airplane and we're tracking these things so that planes don't crash into each other. Shouldn't we have that same sense of concern and urgency about road travel? The average number of fatalities each year from airplanes is less than 100. The average number of deaths on the highway is 42,000. I think we've got to enter the debate as to whether we're willing to change that in a substantial way and it may be that we have to allow something on our vehicles that makes our car safer. . . I wouldn't mind some of this information being available to make my roads safer so some idiot out there doesn't run into me."

Schuster insists that drivers shouldn't worry about the government storing information about their travels because personal identifying information would be stripped from it.

"They're not going to archive all of the data, they're going to archive the data they need," Schuster said. "They want origin, they want destination, they want what route that vehicle took. They don't want the personal information that goes with that because it's useless to them."

Schuster's words would be more reassuring if they didn't contradict planning documents authored by his organization and USDOT.

ITSA's own website on ADUS says data archived by INTI databases will include "vehicle and passenger data." So does the USDOT's Ten-Year-Plan. In fact, according to ITSA's own privacy principles, which are printed on its website, transportation systems will collect personal information, but only that information that's relevant for "intelligent transportation system" purposes.

"ITS, respectful of the individual's interest in privacy, will only collect information that contains individual identifiers that are needed for the ITS service functions," the site reads. "Furthermore, ITS information systems will include protocols that call for the purging of individual identifier information that is no longer needed to meet ITS needs."

In other words, identifying information will be purged when government and corporate users no longer have a need for it, not when it becomes a privacy issue for an individual driver.

Everyone Creative Loafing spoke to for this article, and every federal document we examined, insisted that safeguards would be put in place to protect this data. So far, though, no one has been able to specify exactly how these safeguards will work.

It's a problem Eric Skrum, Communications Director for the National Motorists Association, is familiar with.

"Information on this is awfully hard to get and it's also very conflicting, where one hand will be telling you one thing and the other will be saying oh no, we wouldn't possibly be doing that," Skrum said.

It's a problem Creative Loafing ran into as well. For instance, Schuster insists that the data the system will eventually collect won't be used to issue people speeding tickets or other traffic citations.

P-090-027

But according to ITSA's own privacy principles, the information won't be shared with law enforcement -- until states pass laws allowing it. In fact, the US Department of Justice and USDOT are already working on a plan to share the data ITS systems collect with law enforcement. It's called the USDOT/DOJ Joint Initiative For Intelligent Transportation & Public Safety Systems, and its aim is to coordinate the integration of the system with police and law enforcement systems by developing the software and technical language that will allow them to communicate.

After Sept. 11, ITSA and USDOT added a homeland security addendum to their 10-year plan. The system, through wireless surveillance and automated tracking of the users of our transportation system, could bolster Homeland Security efforts, it said.

Sensors deployed in vehicles and the infrastructure could "identify suspicious vehicles," "detect disruptions" and "detect threatening behavior" by drivers, according to the addendum. Those who take public transit wouldn't escape monitoring, either. The addendum suggests "developing systems for public transit tracking to monitor passenger behavior."

So who will control the information transmitted by the on-board units? That's still up in the air, too. Like the black boxes now installed in cars that record data before a crash that can later be used against the driver, it's possible that the on-board units will be installed in new cars before the legal issues surrounding the data they collect are fully resolved, says one industry insider.

Robert Kelly, a wireless communications legal expert who has acted as legal council to ITSA, says privacy law will have to evolve with the technology. In other words, privacy issues probably won't be resolved until the technology is already in place. Legislatures and Congress will have to guide how everyone from law enforcement to corporations use the data and exactly what information they have access to, Kelly said.

But again, with privacy organizations largely in the dark and the development of the system hurtling forward, the question is how much influence, if any, privacy advocates will be able to wield before these devices are installed on the first future fleet of cars.

That's part of what frustrates Skrum, the National Motorists Association communications director. "Because this is being done behind closed doors to a certain extent, the public isn't really going to have much to say about it," said Skrum.

The good news is that there's still time for the public to weigh in. It will take USDOT at least three more years of development and consumer testing before the first prototype "on-board unit" is ready. In the meantime, the federal government, automakers and the state departments of transportation will have to hash out a couple of billion-dollar details. So far, the government has borne nearly all the cost of developing the on-board units. But that will soon change. For the system to work, automakers must sign on to mass produce the on-board units and install them in cars, a move that will cost billions.

At the same time, the government must install the roadside readers to transmit the messages cars send, or the on-board units will be useless. So to bring the system to life, the government must spend millions, if not billions, on roadside units to communicate with cars at roughly the same time automakers begin installing the on-board units.

As Japan, Europe and foreign carmakers dash to develop similar technology, US automakers are under tremendous pressure. This is creating something of a chicken and egg situation. Given the nature of federal and state transportation budgets, the rollout of roadside units is likely to be gradual, starting at select trouble spots across the nation. But automakers say they need a mass deployment to make their effort worthwhile. They want to see a rollout of at least 400,000 roadside readers over about a three-year period.

A decision is currently slated for 2008, when automakers and the USDOT plan to come together to hash out a deployment strategy. At stake will be billions of dollars -- both in

P-090-027

investments and profits. If the government and automakers can agree on a deployment plan, technology companies are expected to begin investing more heavily in the further development of programs the technology will enable.

ITSA projects that $209 billion could be invested in intelligent transportation technology between now and the year 2011 -- with 80 percent of that investment coming from the private sector in the form of consumer products and services.

Jean-Claude Thill, a professor at the University of Buffalo who specializes in transportation and geographic information systems, says he believes the system will be deployed, just not as fast as car makers would like.

"It's not going to happen all at once," said Thill. "Look at cell phones. Right now in large urban areas you have a high density of cell towers so you have good coverage. If you venture on the interstate your signal gets weak and sometimes you lose it. You can't expect this to be different."

Thill says he believes the automobile manufacturers are playing hardball with the government to make sure the infrastructure is put in place quickly.

"I think the automobile manufacturers will do it," said Thill. "There is money in it. I think as the market develops in large urban areas, they will see that it is in their interest to get on the wagon. But nothing is going to happen until they are on board."

From the government's perspective, the good news is that a few sensors in a few cars and a little GPS technology can go a long way.

"Only a relatively small percentage of the approximately 260 million vehicles on US roads today need to be equipped with communication devices for the system to start producing useful data," said Bill Jones, the Technical Director of the USDOT's ITS Joint Project Office in a speech to the National Research Council's Transportation Research Board in January. "With 14 to 15 million new vehicles sold in the US each year, within two years you can have 10 percent of all vehicles equipped. We already know from our previous studies that a vehicle probe saturation of less than 10 percent can provide good information."

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Data Mining and Surveillance

www.fromthewilderness.com/free/ww3/012605_watching_you.shtml

They're Watching You (about data mining corporations versus personal privacy)

... We appear to be on the brink of a post-September 11 surveillance society. In one optimistic scenario, the U.S. is employing its full range of technical ingenuity to ferret out terrorists, using all the resources of the Digital Age and its quirky software geniuses. Meanwhile, dazzling new biometric identifiers -- iris scans, voiceprints, DNA registries, and facial recognition software -- are about to reduce identity theft to a quaint memory even while they shorten airport security lines and speed up credit approvals.

But in a less appealing second scenario, we could be on the verge of surrendering every detail about our private lives to an all-knowing Big Brother alliance of cops and mysterious private security corporations. They'll promise to protect us from terrorists. But along with that safety, we'll face arbitrary and unappealable decisions on who can fly in a commercial airliner, rent a truck, borrow money, or even stay out of jail.

That's the conundrum at the center of No Place to Hide, a finely balanced look at the see-saw struggle between security and privacy. Author Robert O'Harrow Jr., a Washington Post reporter, deftly shows how the government and its contractors have been lurching between these two goals ever since the September 11 terrorist attacks raised homeland security to the public's top priority.

P-090-027

The biggest threat and the biggest promise seem to lie not with official government databases but with the private companies that sell their information to all levels of government and to banks, airlines, credit-card companies, mortgage holders, car-rental agencies, and the like. ...

After September 11, it was only natural that these companies would volunteer their services in tracking terrorists. They had a head start in a critical technology: data mining. In practical terms, that involves cross-indexing every conceivable source of information -- unlisted telephone numbers, credit-card records, appliance warranty cards, insurance claims, arrest warrants, Social Security numbers, child custody orders, book purchases, E-ZPass records -- to compile a list of suspects or even possible terrorists that need to be placed on the Homeland Security Dept.'s "no fly" list.....

www.fromthewilderness.com/free/ww3/012005_ptech_pt1.shtml
PTECH, 9/11, and USA-SAUDI TERROR - Part I
PROMIS Connections to Cheney Control of 9/11 Attacks Confirmed, by Jamey Hecht, With research assistance by Michael Kane and editorial comment by Michael C. Ruppert

.... Total Information Awareness or TIA, an Orwellian nightmare of data mining that uses PROMIS-evolved technologies and artificial intelligence, is now operating and able to incorporate vastly divergent data bases of personal information on private citizens from computer systems using different languages in near-real-time. Every bit of personal information from grocery shopping habits to driving records, credit reports, credit card transactions and medical records is now almost instantly accessible. Access will be expedited and broadened to local law enforcement agencies when what will become a national ID card comes into being. That will happen as driver's licenses are standardized nationwide (following the recent intelligence reform act) to include a simple UPC-like code that will allow approved agencies to get all of our data. The surveillance and intervention capabilities of PROMIS progeny can now be used to prohibit a credit card purchase or (soon) prevent someone from boarding a commercial aircraft. These capabilities could also be used to empty a private bank account or - when coupled with biometric face recognition technology - prevent you from making a withdrawal from your bank or even buying food.

In every one of these software applications there are two themes: machines that "talk" to each other and artificial intelligence. (Please see Crossing the Rubicon). As you will see below, these capabilities are now known to exist.

TIA has been renamed several times. We know that the first software was delivered to the Defense Advanced Research Projects Agency (DARPA) in 2003. Its latest nom de guerre is TIE or Trusted Information Environment. According to the San Francisco Chronicle last October TIE now allows the government to access private databases without a warrant. I go one step further to assert that TIE allows access to private databases without the knowledge of the database owners, provided only one condition exists: the database can be accessed through the internet.

And although the public face of TIA pretends that these technologies have not yet been applied, we are certain with the publication of this story that the same software the government needs is already in use by private corporations - the big ones - and we remind the reader that FTW's map of the world states that the government has been turned into a franchise operation of these corporations anyway. So where's the seam?

What the courageous and brilliant Indira Singh has to tell us is a matter of monumental importance. Based upon these new revelations which confirm what I suggested in Crossing

P-090-027

the Rubicon every American and quite likely every citizen of an industrialized nation should assume that all of these technologies are operational today. A bit of breathing room is left as I conclude that they have not been sufficiently deployed yet to monitor all citizens in real time. My best assumption is that right now perhaps a million or so high-interest Americans are under constant surveillance; all by computer technology which has proven so accurate that it can detect suspicious movements just by correlating gasoline and food purchases with bank withdrawals and utility consumption. [--Michael C Ruppert]

www.theage.com.au/news/technology/how-they-keep-track-of-our-every-move/2006/02/03/1138836402623.html?page=fullpage#contentSwap2

Eyes on the road

February 3, 2006 - 11:19AM

Speed cameras, red-light cameras, e-tags. Innocuous technology to make the roads safer and our journey simpler ... or a series of "Little Brothers" keeping track of our every move? Nikki Barrowclough looks behind the boom in traffic monitoring.

Eight years ago, on the night that a Saudi diplomat was brutally murdered in his Canberra apartment, a car was filmed travelling south along the Hume Highway towards the national capital. Then, a few hours later, it was filmed heading north back towards Sydney.

The car wasn't being tailed by the Australian authorities, the Saudis or anyone else. The "spy" was a humble traffic camera, although this emerged only after four people were arrested and brought to trial over the diplomat's violent death. The fact that the camera had been set up to monitor speeding and unregistered trucks didn't cause a ripple. The candid Safe-T-Cam had, in fact, filmed every vehicle travelling along that stretch of the Hume. So when the diplomat's ex-lover insisted to police that she and her new boyfriend had been in Sydney at the time of the crime, the authorities had only to look at an image of her car fleeing back up the highway to know that she was lying.

Few people would be troubled by the use of traffic cameras to locate criminal suspects. But the Canberra incident highlights how the mass surveillance of motorists, far from being an Orwellian conspiracy theory, is now routinely practised and growing more pervasive by the year. In Australia and other major Western countries, traffic is increasingly monitored with the sort of sophisticated technology that makes the image of a shadowy figure watching through binoculars seem impossibly quaint. Whether we're appearing in "real time" on one of the hundreds of traffic cameras operated by central command centres in Melbourne and Sydney, being "flashed" on a speed or red-light camera operated by the police, or clocked on a toll road with our seemingly innocent e-tags, it's almost impossible to drive anywhere without being monitored and/or leaving an electronic data trail.

It's even getting harder to disappear on obscure back roads thanks to GPS - the US military-developed global positioning system whose satellite tracking can pinpoint a car's location to within a few metres. A group of Stanford University academics in the US are reportedly working on satellite navigation systems so accurate they will be able to tell authorities whether you're in your car or standing next to it. This is revolutionary technology, and great if you get lost or have an accident or your car is stolen. But there's a chilling aspect to it all as well - namely, the loss of individual privacy.

Two years ago, the Office of the Victorian Privacy Commissioner devoted an entire edition of its newsletter, Privacy Aware, to just one subject: "Privacy and the Car". It included a brief section on telematics, the term used to describe the combining of satellite GPS, in-car computers and mobile phone technologies. "Telematics raises concerns because, while GPS receivers

P-090-027

cannot send data back to a central location, mobile phones can. Used together, they turn the vehicles they're embedded in into very powerful tracking and monitoring devices," the report declared.

How much covert monitoring goes on in tandem with open surveillance, such as speed cameras, is anyone's guess, because that's not the sort of information governments readily disclose. Professor Roger Clarke, a Canberra consultant in data surveillance and information privacy, regards the Hume Highway incident as an example of "function creep" - when technology, set up for one purpose, secretly ends up serving another purpose as well. And function creep, he says, is a way in which the "surveillance society" has sneaked under the public's guard.

"The social and political commentators have missed it, but what's more worrying is that young people have grown up with surveillance and have a different attitude to it," Clarke says. "They think life's like that."

Governments and transport authorities insist that such surveillance systems are totally benign. They are about road safety, keeping people alive, and managing increasing volumes of traffic more efficiently, they say. This isn't just soothing rhetoric - with around 1600 deaths on Australian roads last year alone, road safety is a huge issue - but at the same time we seem to have ceded our civil rights as motorists.

Cameron Murphy, president of the NSW Council for Civil Liberties, does not doubt that surveillance technology is about much more than simple traffic management.

"Most people are aware that speed cameras and red-light cameras are obviously there for infringement purposes," Murphy says. "But we are also aware that there's an extensive network of cameras that can track people from one end of the city to the other, along freeways and on main arterial roads.

"You should be able to go from A to B without the government monitoring you. If the prime motive is traffic management alone, then you don't have to survey one end of the freeway to the other - it doesn't add up. That's when it becomes an invasion of privacy ... Recording where people go, what time of day they travel. If there aren't appropriate controls, the data could be used for commercial purposes or by any other government agency."

Given the fear of terrorism and the heightened national security alert, the potential of some of the new "smart road" technologies is obvious. For instance, British firm Hills Numberplates has already devised so-called e-Plates, numberplates embedded with radio frequency identification (RFID) tags. These tags act as tracking devices that transmit a unique, encrypted ID code via silicon chips that cannot be seen or removed. Known as a silent technology, RFID is sometimes described as a sophisticated barcode because it can identify and track goods from a distance.

Hills Numberplates claims a single "reader" positioned at the roadside can identify dozens of vehicles fitted with an e-Plate, moving at any speed, at a distance of up to 100 metres. But will they catch on here? VicRoads has no plans to bring in e-Plates. However, the NSW Roads & Traffic Authority says they have certainly been up for discussion - though as yet there's no decision to introduce them.

"But as with everything of this nature, it's a case of watch this space," a spokesman says.

Transport authorities are also keeping an open mind about an electronic version of the vehicle identification number (VIN) that comes with every car. A Department of Transport and Regional Services spokesperson in Canberra says that while there are no plans "at this point in time" for an electronic VIN, that doesn't mean it won't happen.

Melbourne-based academic Professor Marcus Wigan, an adviser to the US Department of Transport, is also the Australian Privacy Foundation's spokesman on intelligent transport systems. He says e-VINs (which would transmit to a central location as cars pass specific points)

P-090-027

are simply a more efficient way of managing the many regulatory aspects of the identity of vehicles. An e-VIN would certainly decimate the stolen car trade, but it would also obviously increase the ability of authorities to track cars and monitor daily travel routines.

The expression "intelligent transport systems" (ITS) is a catch-all phrase for the in-car electronics, smarter roads, satellite navigation technology, tolling systems and remote road monitoring being employed increasingly throughout the world - sometimes without limit.

Last September, as Hurricane Rita bore down on Texas, and hundreds of thousands of motorists fleeing the Houston area became trapped in a 200-kilometre traffic jam in which cars were abandoned and people collapsed from heat exhaustion, officers from the state's highway system were reportedly scanning e-tags to make sure evacuees had paid their tolls.

Meanwhile, London's Independent newspaper reported late last month that the United Kingdom was about to become the first country in the world where all motorists would be monitored by a vast network of cameras that would read the licence plates of every passing car. Neither the Home Office nor the British police denied the story, or the paper's claim that the ultimate plan was to build a huge database of vehicle movements so that police and security services could analyse the journeys of individual drivers.

And in the US, the Washington-based Intelligent Transportation Systems Joint Program Office - a powerful, 500-strong group of car manufacturers, technology companies and government interests - has reportedly spent more than $4 billion and almost 15 years developing a system of tracking and sensor technology that would collect data on the movements of every driver and public transport user. The stated aim of this system, known as the Integrated Network of Transportation Information, is to reduce the 40,000 or so annual road deaths in America by allowing government agencies to intervene directly between drivers, their cars and the road. And authorities want to have it in place within the next decade.

Whether or not they were designed for such purposes, what intelligent transport systems do is identify specific vehicles - and, therefore, their drivers.

The term first cropped up in Australia about 15 years ago. In 1992, an organisation called Intelligent Transport Systems Australia was set up in Melbourne, and today its membership base includes government, scientific, academic and car manufacturing groups. The group's executive director, Brent Stafford, says he expects that all new vehicles will be equipped with satellite navigation and telematics by 2010. And while he says he understands people's unease about such technologies, he can't see why such systems would be used to track Australians en masse, as seems to be the intent in Britain.

"It's quite easy to track the movements of every vehicle, but you'd have to ask, 'What for?'" says Stafford. "You'd also have to consider how much it would cost. ITS is the application of technology to transport. It's not the application of technology to security. The fact is, there'll be lots of Little Brothers looking after you, but no Big Brother spying on you."

Lachlan McIntosh, chief executive of the Australian Automobile Association, shares Stafford's view. "Why would you want to track everybody? And what would you do with all that data?" he asks.

When Good Weekend suggests to him that, given the uncertain times we live in, such surveillance options could be very attractive to government departments, he replies: "In France during World War II, everyone was tracked and monitored without these technologies.

I think surveillance comes and goes in society ... If there's a political will to monitor what everybody does, then it's likely to happen.

"In the end, there are a lot of benefits in monitoring where you are: the emergency response if you are to have an accident, for instance ... If, as you say, this will happen, and everyone had a monitoring device in their car that said they just had an accident, we may well save 100 or 200

P-090-027

lives a year. Okay, you may well have been going to Cronulla when you shouldn't have been, or maybe you had an unfortunate crash and nearly died, but you were saved because of the device. There are trade-offs in those discussions, and we often forget the benefits when we talk about the downside."

There are also advantages in being able to keep an eye on hazardous cargo or large sums of money, he adds. "We all want to know that if a cargo of ammonium nitrate goes missing, it can be tracked and found. Is that an intrusive activity on the driver of the truck? Well, maybe it is, but it's a security mechanism as well. Now, should you want to put surveillance on a particular car for some criminal activity, I imagine you would need a warrant and you would have to go to a magistrate to obtain it. So I would think Australians would want to ensure that they are protected through our court system against the undue use of surveillance."

People have to be informed about the benefits of the new technology, what the implications are and what the risks are, he adds. "As long as we have that sort of reasonably informed debate in Australia, I think we're likely to want to adopt the latest technology."

But is there debate? Dr Peter Chen, a political scientist who lectures in communications at the National Centre for Australian Studies at Monash University, says Australians tend to be relatively passive when it comes to such matters.

"While we like to tell ourselves that we have a healthy disregard for government, it's total fiction. We're very accepting of increased state security and surveillance for whatever reason," Chen believes. And when governments talk up safety as a way of getting more surveillance systems under the wire without causing public alarm, we generally accept official reasoning.

"That's the argument that's always used," says Chen. "No government ever says we're introducing wide-scale surveillance for anything but notions of public safety, and while the paranoid concerns of some people are somewhat overstated, systematic surveillance technologies are very compelling tools for governments of all persuasions, and tend to inevitably lead to the expansion of their use into other areas of public policy."

Remote surveillance, like static cameras and portable speed cameras, is cheap, too; much cheaper than human surveillance. "This was a key argument in the government's support for electronic tagging of terrorist suspects late last year: surveillance technologies are cheaper than policing," he says.

Police in NSW recently began using high-tech scanning units that employ automatic numberplate recognition (ANPR) technology to "read" the registration of passing vehicles and check them against an RTA database, as a way of detecting stolen and unregistered vehicles. Victoria Police trialled the technology, too, but has opted instead for mobile data terminals linked to the main police computer system, from which police can also access the VicRoads registration database. Seven hundred of these terminals are now being fitted to police cars, motorbikes, boats and helicopters by the Victorian Department of Justice.

Paul Chadwick, the Victorian Privacy Commissioner, wrote about ANPR technology during the trial. The systems, he pointed out, can be linked to existing surveillance camera systems, "so multiplying the 'eyes' of the State, and can be linked to a variety of databases, so expanding the State's 'memory'".

Meanwhile, the ordinary motorist, blithely driving across town or to a lunch in the country, should think twice about e-tags - those small, wireless electronic transponders attached to the windscreen that collect information about a car's movements and charge the owner a toll.

The e-tag revolution kicked off in Melbourne in 2000 with the opening of the privately operated, 22-kilometre CityLink, one of the world's first automated, fully electronic toll roads. In Sydney, both the controversial Cross City Tunnel and the recently opened Westlink M7 are also fully automated. This means that toll-road operators, whether they're government or private

P-090-027

companies, can collect personal information such as your vehicle registration, driver's licence number, credit card details, name and address and your pattern of travel.

And that's a concern to lawyer Anna Johnston, a former NSW deputy privacy commissioner who's now the chair of the Australian Privacy Foundation. As she notes, drivers on these toll roads now have no choice but to identify themselves every time they use them. "I don't want to indulge in conspiracy theories, or say that we have reached that 'Big Brother' point," she says, "but there is a danger we are sleepwalking into a situation where more and more of our information can be logged, tracked, profiled and matched in ways that haven't really been contemplated in the past. That may not be the intention at the time a new technology is introduced - but of course with each new technology, with each new chipping-away at our privacy, it makes the next step so much easier."

Johnston's foundation campaigned against a law passed in NSW last May, which allows the RTA to issue photo identity cards to non-drivers over 16 years of age (VicRoads has no plans to introduce the voluntary scheme).

"We weren't against the concept of a photo ID card for non-drivers - there's a need for it, clearly - but we suggested an alternative way to develop it, so that it didn't result in one database being held by one agency covering the entire population, whose details get printed on a card which is both unique and universal. All that, of course, is like a national ID card, which Australians rejected in 1987."

The bill didn't limit the type of information that could be collected and stored, Johnston says, and the legislation specifically allowed the RTA to put the two databases (driver and non-driver) together. She's concerned the latter will eventually happen.

However, both the RTA and a spokesman for the NSW Roads Minister, Joe Tripodi, assured Good Weekend that the photocard database would be kept separate from other databases within the authority, and that there would be separate databases for drivers and non-drivers. In a statement, the RTA also said that databases kept on NSW motorists are not integrated, for privacy reasons, and that access to one database doesn't automatically mean access to another.

The inevitability of more privately run, cashless toll roads, and a more widespread user-pays road system means there'll be more databases and more information stored on motorists. Privacy laws protect access to all databases, although privacy advocates tend to be lukewarm about their effectiveness.

"You get principles that sound great in theory, like, 'This information should only be used for the purpose for which it's collected, or with your consent', and people say, 'Oh good'," says Nigel Waters of the Australian Privacy Foundation. "Then you look at the fine print where it says, 'Except in emergencies, for law enforcement and a whole raft of other exemptions.'"

But the acting Privacy Commissioner for NSW, John Dickie, argues the Privacy Act is not without teeth. "Government departments and agencies are subject to it. People can't just wander off and get around things - [though] if there is a serious crime, all bets are off," he says.

Four years ago, a former employee of Transurban, the company that operates CityLink, admitted in court that he had passed on the credit-card details of more than 8000 CityLink customers to cyber thieves, who then used them for an internet spending spree. A subsequent review of Transurban's information handling practices by the Office of the Federal Privacy Commissioner found Transurban needed to take steps to reduce the risk of further privacy breaches. The FPC won't detail what those measures involved.

A spokesman says there were no fundamental problems and that Transurban merely needed to "enhance" existing systems.

Meanwhile, Transurban has told Good Weekend that it takes the protection of personal information seriously, and that the manner in which it manages the use and disclosure of personal

P-090-027

information goes beyond obligations imposed by state and federal privacy legislation. The information it collects on its database is used only for collecting tolls and enforcing toll collection, isn't available to other organisations, and is only made available to police or to an authorised government body once there's a properly authorised written request.

It's not just toll-road operators who are amassing huge amounts of data on private citizens. In what could almost be called privatised intelligence gathering, the outsourcing of traffic management systems to private-sector organisations means more databases still. One such organisation is Tenix, the contractor employed by Victoria Police to operate its speed cameras - and which wrongly fined more than 100 motorists last July after the wrong speed limit was entered into the machine by an operator.

"I guess if there's a concern about the private-sector organisations holding increasing amounts of data, it's, 'Where are they holding it, how secure is it, and what purpose are they putting it to?'" says Monash's Peter Chen, who believes we will soon be talking about "data laundering" the way we now talk about money laundering. "I think it's safe to say that governments around the world, not just in Australia, have been lousy at regulating the movement of data about members of the public held by private-sector organisations.

"We have privacy laws which are relatively tight, but ... if you put a large chunk of the general surveillance system data into private hands, the company that picks up that contract will undertake that work in the most effective and efficient way for their profitability. And that might mean warehousing and processing data offshore, outside the legal jurisdiction of Australian governments. If I were a car company, I'd be very interested in finding out about the sort of people who drive a lot, who they are, what are their characteristics. If that information was held in a country with

poor data security legal provisions, then data could be sold, resold or 'stolen'. That's not a conspiracy theory view. It happens all the time. Large amounts of data get 'lost' in transit every year around the world."

Marcus Wigan points out that no one "owns" the information stored about them - so there's very little redress for consumers if their data is misused. "There's no such thing as intellectual property when it comes to information about you," he says. Nevertheless, he cautions against paranoia over intelligent transport systems, even though he has his own concerns about the data building up as a result of new technologies.

"The rules we have to manage that information are reasonably good, but not so good as to handle a situation of future cross-linkages between all those databases," he says. "So if we have [someone's] entire historical records on a range of individual databases, and at some point, for administrative convenience, a link is drawn between them, then the result is a complete history of locations, times, events of many different kinds that suddenly becomes available as a single resource. That's a quantum leap.

"Your vehicle will have had its numberplate [photographed] various times, your e-tag will have been caught - you only have to have one identification token transferred between two or more agencies for an amazing degree of record linkage with other sources of information about you and your activities over a considerable period.

"The ability to manage this is improving incredibly quickly. Once this is achieved and it's a few years away yet - we suddenly get a retrospective loss of privacy of an enormous order [and] ITS systems become surveillance systems.

"I'm not saying they'll be used in that way," Wigan adds. "I'm saying the potential for that to occur ... would then become a low-cost, low-effort issue. We need to use the time until all this is in place to educate and earn the trust of the community to secure the very real benefits of intelligent transport systems."

P-090-027 Published in the Good Weekend on January 28, 2006

P-090-028

Attachments

Several reports were sent separately that have background on the bridge issue and the issues of Peak Traffic:

the 2005 Hirsch Report prepared for US Department of Energy

International Energy Agency, Saving Oil in a Hurry, 2005

US Department of Energy, Future U.S. Highway Energy Use: A Fifty Year Perspective, May 3, 2001

Richard Heinberg, Powerdown (introduction)

Business Week admits Peak Traffic is here, gas price increases are permanent, suburbia is winding down"

"Peak Traffic"
Peak Traffic: Planning NAFTA Superhighways at the End of the Age of Oil
www.road-scholar.org/peak-traffic.html

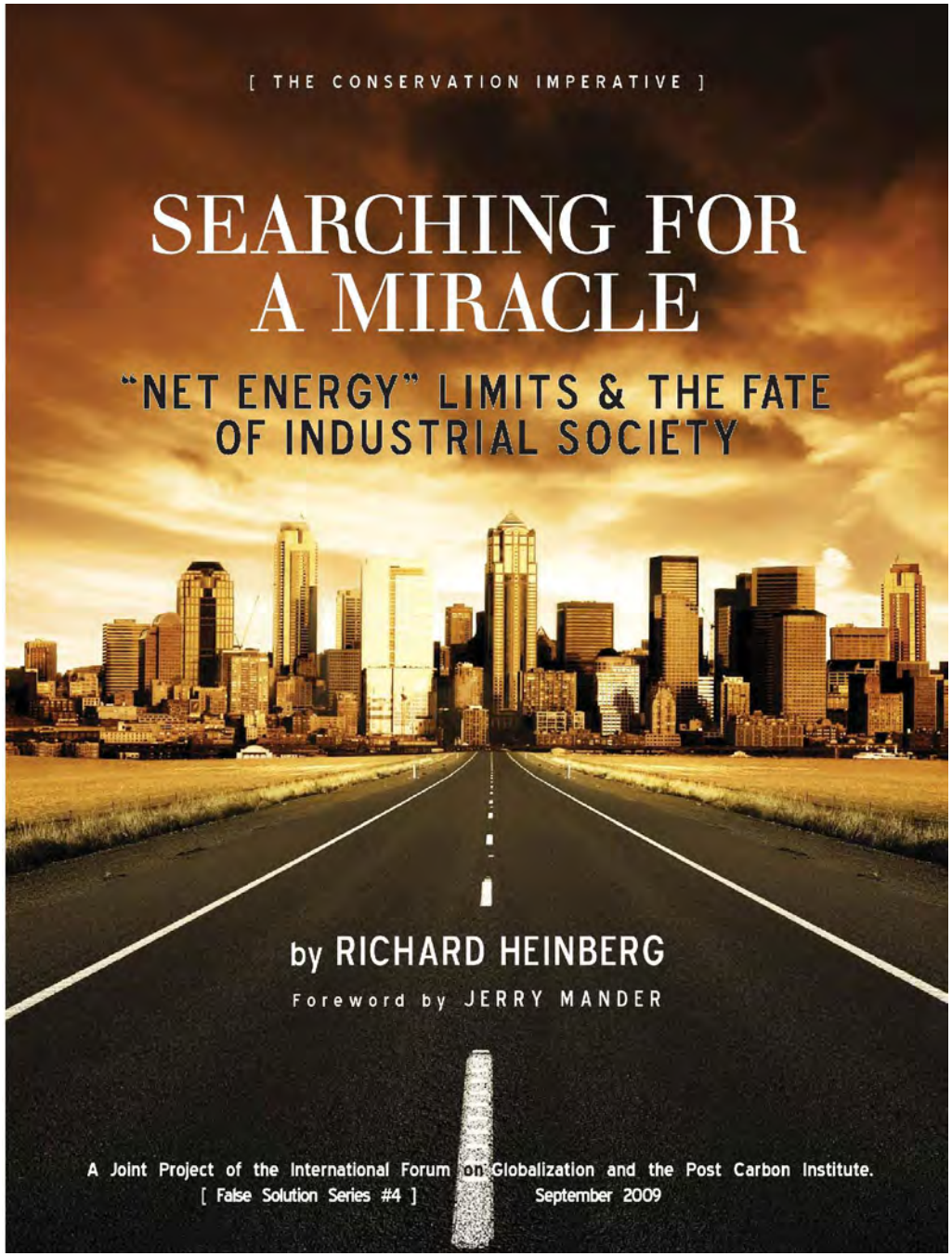
Behind enemy lines with the granola commandos
Published in Detroit Metro Times, 1993.
article about toxic waste used to power cement kilns

"Crude Oil: the supply outlook" report to the Energy Watch Group, October 2007

"Scientific American report" The End of Cheap Oil (March 1998)

P-090-028

Please see response to P-090-001.


[THE CONSERVATION IMPERATIVE]
SEARCHING FOR A MIRACLE
"NET ENERGY" LIMITS & THE FATE OF INDUSTRIAL SOCIETY
by RICHARD HEINBERG
Foreword by JERRY MANDER
A Joint Project of the International Forum on Globalization and the Post Carbon Institute.
[False Solution Series #4]
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SEARCHING FOR A MIRACLE



'Net Energy' Limits & the Fate of Industrial Society

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CONTENTS

Foreword: Which Way Out? *by Jerry Mander* 1

One: Overview 7
- *Glossary of Terms*
- *What is Energy?*

Two: Nine Key Criteria: Comparing Energy Systems, and their Limits 15
- *1)* Direct Monetary Cost
- *2)* Dependence on Additional Resources
- *3)* Environmental Impacts
- *4)* Renewability
- *5)* Potential Size or Scale of Contribution
- *6)* Location of the Resource
- *7)* Reliability
- *8)* Energy Density
  - *a)* Weight (or Gravimetric) Density
  - *b)* Volume (or Volumetric) Density
  - *c)* Area Density
- *9)* Transportability

Three: The Tenth Criterion: "*Net Energy*" (EROEI) 23
- Returns on Investments (EROEI)
- Replacement of Human Energy
- Heyday for Fossil Fuels
- How EROEI Shapes Society
- EROEI Limits Energy Options
- EROEI: Distinct from Efficiency
- Net Energy Evaluation: Imprecise but Essential for Planning

Four: Assessing & Comparing Eighteen Energy Sources 31
1) Oil
2) Coal
3) Natural gas
4) Hydropower
5) Nuclear
6) Biomass
7) Wind Power
8) Solar Photovoltaics (PV)
9) Active (concentrating) Solar Thermal
10) Passive Solar
11) Geothermal Energy
12) Energy from Waste
13) Ethanol
14) Biodiesel
15) Tar Sands
16) Oil Shale
17) Tidal Power
18) Wave Energy
Other Sources

Five: Toward a Future Energy Mix 56
A Process of Elimination
Common Carriers: Electricity and Hydrogen
Energy Storage and Transmission
Transition Plans

Six: The Case for Conservation 65

References
Bibliography

The International Forum on Globalization
The Post Carbon Institute



Tokyo. Powered by imported oil and gas, combined with nuclear and coal. Japan is world's 3rd largest importer of oil and gas (after U.S. and China) and 4th largest user of energy (after U.S., China, Russia.) Fierce competition among industrial nations for remaining supplies, especially from Africa, South America, and the middle East, creates a precarious geopolitical situation. Japan may turn in future to more nuclear.



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As fossil fuels' supply dwindles and becomes more costly and polluting, renewed attention is on nuclear, and a theoretical "4th generation" of safer technology. But, as with proposed "clean coal" technology, "new nuclear" remains in the realm of scientific imagination, with high odds against it, and terrible downside potential. Problems of safe production, transport, waste disposal, ballooning costs, and limits of uranium supply are not nearly resolved. And nuclear's "net energy" ratio—the amount of energy produced vs. the amount expended to produce it—is low, putting it squarely into the category of "false solution."

FOREWORD: WHICH WAY OUT?

by Jerry Mander
INTERNATIONAL FORUM ON GLOBALIZATION

THIS LANDMARK REPORT by Richard Heinberg is #4 in the False Solutions series published since 2006 by the International Forum on Globalization.

Prior reports include "The False Promise of Biofuels," by IFG board member Jack Santa Barbara, which was first to predict what was confirmed a year later in dire studies from the Organization of Economic Cooperation and Development (OECD) and the United Nations—that the mad rush toward biofuels, especially corn ethanol, well underway by 2006, would cause more global environmental, agricultural and hunger problems, than it could ever begin to solve.

Despite this, U.S. policy continues to favor subsidizing industrial biofuels.

A second publication in the series, produced in partnership with the Institute for Policy Studies, was "The Manifesto on Global Economic Transitions"—a collective effort among 50 IFG Board and Associate Members. It is essentially a draft roadmap for the mandatory transformation of industrial society in recognition of limits imposed by planetary carrying capacities.

The third report, "The Rise and Predictable Fall of Globalized Industrial Agriculture," was written by former IFG executive director, Debbie Barker. That report shredded the expensively advertised notions that industrial agriculture systems are the best way "to feed a hungry world." The opposite is actually the case. The publication exposed and amplified a myriad of little-recognized connections of industrial farming to advancing hunger, global migrations, and climate change, among many other deadly effects. All of these publications are now in wide distribution.

The report which follows here, "Searching for a Miracle: 'Net Energy' Limits, & the Fate of Industrial Society," by our longtime friend and colleague Richard Heinberg, an associate member of IFG and senior fellow of the Post Carbon Institute, is the first to use the newly emerging techniques of "life cycle technology assessment," and in particular "net energy" analyses, for in-depth comparisons among all presently dominant and newly touted "alternative" energy schemes. These include all the major renewable systems currently being advocated. For the first time we are able to fully realize the degree to which our future societal options are far more limited than we thought.

With fossil fuels fast disappearing, and their continuing supplies becoming ever more problematic and expensive, hopes have turned to renewable sources that we ask to save "our way of life" at more or less its current level. Alas, as we will see, the "net energy" gain from all alternative systems—that is, the amount of energy produced, compared with the amount of energy (as well as money and materials) that must be invested in building and operating them—is far too small to begin to sustain industrial society at its present levels. This is very grim news, and demands vast, rapid adjustments by all parties, from governments to industries and even environmental organizations, that thus far are not clearly in the offing. There are, however, viable pathways forward, most importantly and urgently the need for a wide-ranging push for conservation; it is only a question of realism, flexibility,

dedication, and more than a little humility. Our beloved "way of life" must be reconsidered and more viable alternatives supported.

THE WRONG TREE

We observe daily the tragic, futile official processes that continue to unfold among national governments, as well as global political and financial institutions, as they give lip service to mitigating climate change and the multiple advancing related global environmental catastrophes. Those crises include not only climate disruption, and looming global fossil fuels shortages, but other profound depletions of key resources—fresh water, arable soils, ocean life, wood, crucial minerals, biodiversity, and breathable air, etc. All these crises are results of the same sets of values and operating systems, and all are nearing points of extreme urgency.

Even our once great hopes that world governments would rally to achieve positive collective outcomes in some arenas; for example, at the United Nations climate change talks in Copenhagen, as well as other venues, are proving sadly fatuous. But certain things are ever-more clear: Global institutions, national governments, and even many environmental and social activists are barking up the wrong trees. Individually and as groups, they have not faced the full gravity and meaning of the global energy (and resource) conundrums. They continue to operate in most ways out of the same set of assumptions that we've all had for the past century —that fundamental systemic changes will not be required; that our complex of problems can be cured by human innovation, ingenuity, and technical efficiency, together with a few smart changes in our choices of energy systems.

Most of all, the prevailing institutions continue to believe in the primacy and efficacy of economic growth as the key indicator of systemic well-being, even in light of ever-diminishing resources. It will not be necessary, according to this dogma, to come to grips with the reality that ever-expanding economic growth is actually an absurdity in a finite system, preposterous on its face, and will soon be over even if activists do nothing to oppose it. Neither does the mainstream recognize that economic systems, notably capitalism, that *require* such endless growth for their own viability may themselves be doomed in the not very long run. In fact, they are already showing clear signs of collapse. As to any need for substantial changes in personal lifestyles, or to control and *limit* material consumption habits? Quite the opposite is being pushed—increased car sales, expanded "housing starts," and increased industrial production remain the focused goals of our economy, even under Mr. Obama, and are still celebrated when/if they occur, without thought of environmental consequences. No alterations in conceptual frameworks are encouraged to appreciate the now highly visible limits of nature, which is both root source of all planetary benefits, and inevitable toxic sink for our excessive habits.

In this optimistic though self-deluding dominant vision, there is also dedicated avoidance of the need for any meaningful *redistribution* of the planet's increasingly scarce remaining natural resources toward more equitable arrangements among nations and peoples—to at least slightly mitigate centuries of colonial and corporate plunder of the Third World. And on the similarly ignored question of the continued viability of a small planet that may soon need to support 8-10 billion people? Some actually say it's a *good* thing. We should think of these billions as new consumers who may help enliven economic growth, so goes that argument. But only if we find a few more planets nearby, perhaps in a parallel universe somewhere, bursting with oil, gas, water, minerals, wood, rich agricultural lands, and a virginal atmosphere.

The scale of denial is breathtaking. For as Heinberg's analysis makes depressingly clear, *there will be NO combination of alternative energy solutions that might enable the long term continuation of economic growth, or of industrial societies in their present form and scale.* Ultimately the solutions we desperately seek will not come from ever-greater technical genius and innovation. Far better and potentially more successful pathways can only come from a sharp turn to goals, values, and practices that emphasize conservation of material and energy resources, localization of most economic frameworks, and gradual population reduction to stay within the carrying capacities of the planet.

THE PARTY'S OVER

The central purpose of all of our *False Solution* documents, including this one, is to assert that this whole set of assumptions upon which our institutions have hung their collective hats, is tragically inaccurate, and only serves to delay, at a crucial moment, a major reckoning that must be understood immediately.

We are emphatically *not* against innovations and efficiencies where they can be helpful. But we are against the grand delusion that they can solve all problems, and we are against the tendency to ignore overarching inherent systemic limits that apply to energy supply, materials supply, and the Earth itself. For example, the grandest techno-utopian predictions at large today, such as "clean coal," via carbon sequestration, and "clean nuclear," via a new "safe 4th generation of reactor design," have already been revealed as little more than the wild fantasies of energy industries, as they peddle talking points to politicians to whom, on other days, they also supply with campaign cash. There is no persuasive evidence that clean coal, still in the realm of science fiction, will *ever* be achieved. Most likely it will occupy the same pantheon of technological fantasy as nuclear fusion, not to say human teleportation. In any case, the entire argument for clean coal, however absurd, still ignores what happens to the places from where it comes. Visit Appalachia sometime—now virtually desertified from mountain top removal, and its rivers poisoned to get at that soon-to-be "clean" coal. Clean nuclear offers similar anomalies—no currently contemplated solution for waste disposal is anywhere near practical—even if uranium supplies were not running out nearly as quickly as oil. To speak of nuclear as "clean" or "safe" is a clear sign of panic while, vampire-like, it's permitted to again rise from its grave.

Okay, we know that some technological "progress" is useful, especially among renewable energy alternatives. Systemic transformations toward a highly touted new complex mix of "renewable" energy systems such as wind, solar, hydro, biomass, wave and several others, will certainly be positive, and together they could make meaningful contributions, free of many of the negative environmental impacts that fossil fuels have brought.

But, as this report exquisitely explains, as beneficial as those shifts may be, they will inevitably fall far short. *They will never reach the scale or capacity to substitute for a fossil fuel system that, because of its (temporary) abundance and cheapness, has addicted industrial nations to a 20th century production and consumption spree that landed us, and the whole world, into this dire situation.* As Richard Heinberg has so eloquently said before, and used as the title of one his very important books, "the party's over."

So, those limitless supplies turned out not to be limitless, or cheap, (or any longer efficient), and we are left with only one real option: to face the need for a thorough systemic transformation of our entire society to one that emphasizes *less* consumption of material resources and energy (conservation), less globalization (shipping resources and products back and forth wastefully across oceans and continents), and *more* localization which has inherent efficiencies and savings from the mere fact of local production and use, and far less processing and shipping. Such changes must be combined with achieving lower population in all global sectors, and the fostering of an evolution of personal, institutional and national values that recognize (even celebrate) the ultimate limits of the earth's carrying capacities, presently being dramatically exceeded. None of that vision has infected the Copenhagen processes, nor those of the U.S. Congress, nor debates in national parliaments; anything short of that is just a self-protective, self-interested smoke screen, or, sheer denial of the realities at hand.

THE NET ENERGY FACTOR

Richard Heinberg's report makes its case by a methodical examination and *comparison* of many of the most important features inherent to the key energy systems of our time. His detailed summaries include "life cycle assessments" of the currently dominant systems such as oil, gas, coal, and nuclear —the very systems which built industrial society, and brought us to this grave historical moment. These systems are now each suffering advancing supply shortages and increased costs, making their future application dubious. Heinberg then explores and compares all the alternative systems now being

hotly promoted, like wind, solar, hydro, geothermal, biomass and biofuels, incineration, wave energy and others. He delineates ten aspects of each system, including everything from direct monetary cost (*can we afford it?*), as well as "scalability" (*will its benefits apply at a meaningful volume?*). He also includes environmental impacts in the formula; the location of the resources; their reliability (*the wind doesn't blow all the time and the sun doesn't shine*); density—how compact is the source per unit?; transportability, etc.

Most important is the tenth standard that Heinberg lists—and the bulk of this document is devoted to it: "net energy," or, the Energy Returned on Energy Invested (EROEI). Heinberg explores this revolutionary analytic terrain thoroughly, basing his reportage on the groundbreaking research of leading scientists, notably including Charles Hall of Syracuse University, who has been the pioneer explorer of the full import of "net energy" to the future of industrialism and economic growth.

What is revealed from this process is that the once great advantages of fossil fuel systems, which in their heyday were able to produce enormous quantities of cheap energy *outputs* with relatively little investment of energy *inputs* or dollar investments—Heinberg puts the EROEI ratio at about 100:1—can no longer approach that level. And, of course, they continue to ravage the planet. Meanwhile, the highly promising alternative energy systems, which in most respects are surely far cleaner than fossil fuels, cannot yield net energy ratios that are anywhere near what was possible with fossil fuels. In other words, they require for their operation a significant volume of energy *inputs* that bring their energy *outputs* to a very modest level. Too modest, actually, to be considered a sufficient substitute for the disappearing fossil fuels. In fact, as Heinberg notes, there is no combination of alternative renewables that can compete with the glory days of fossil fuels, now ending. So, what does this portend for modern society? Industrialism? Economic growth? Our current standards of living? All prior assumptions are off the table. Which way now? Systemic change will be mandatory.

Of course, there is a huge segment of the grassroots activist world that already instinctively understood all this some time ago, and has not waited for governments, separately or in collaboration with others, to do the right thing. The world is now bursting with examples on every continent of enthusiastic efforts to transform communities into locally viable and sustainable economic systems. We see a virtual renaissance of local food systems, thus replacing the supplies of the industrial agriculture machine that often ships from across thousands of miles of land or ocean. And this burgeoning movement is directly supported by a parallel movement toward re-ruralization. We also see extraordinary efforts to limit the power of global corporations operating in local contexts. There is a growing effort by communities to assert control over their own local commons; to resist privatization of public services; and to return to local production values in manufacturing and energy systems so that conservation is placed ahead of consumption. A myriad other efforts also seek to affirm local sovereignty.

Among the most exciting expressions of these tendencies has been the birth and spread of an international "Transition Towns" movement. Originally launched a few years ago in southwest England, it has helped stimulate literally thousands of similar efforts in local communities, including hundreds in the U.S. All are trying to go back to the drawing board to convert all operating systems toward active conservation efforts that minimize material and energy flow-through, protecting scarce resources, while moving toward energy and production systems that are cognizant of and reactive to an entirely alternative set of values.

So far, this is not yet threatening to the larger machines of industrialism and growth, nor to the primacy of corporate power, but time is definitely on the side of such movements. It behooves us all to align ourselves with them. In this case, it is mandatory that we build and take action at the local grassroots level, while also demanding change from our governing institutions, locally, nationally and internationally. But in any case, as the document you are about to read helps make exquisitely clear, the status quo will not survive.



GIGI CRUZ/GAIA

One hidden underbelly of a global economy, dependent on growth and consumption; this roadway runs through miles of trash and waste fields outside Manila. Similar landscapes of waste and pollution are found today in every modern country with one of the world's largest just outside New York.



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Some nations want to expand off-shore drilling, despite threats of spills to oceans, beaches, reefs, and sealife. Increased hurricane dangers from climate change make safety of these platforms ever-more doubtful, and raise chances of future Katrina-like collapses. Meanwhile, oil production also suffers overall declining rates of "net energy" and is far less viable than in its heyday. (See chapter three.)

One

OVERVIEW

THIS REPORT IS INTENDED as a non-technical examination of a basic question: *Can any combination of known energy sources successfully supply society's energy needs at least up to the year 2100?* In the end, we are left with the disturbing conclusion that *all* known energy sources are subject to strict limits of one kind or another. Conventional energy sources such as oil, gas, coal, and nuclear are either at or nearing the limits of their ability to grow in annual supply, and will dwindle as the decades proceed—but in any case they are unacceptably hazardous to the environment. And contrary to the hopes of many, there is no clear practical scenario by which we can replace the energy from today's conventional sources with sufficient energy from *alternative* sources to sustain industrial society at its present scale of operations. To achieve such a transition would require *(1)* a vast financial investment beyond society's practical abilities, *(2)* a very long time—too long in practical terms—for build-out, and *(3)* significant sacrifices in terms of energy quality and reliability.

Perhaps the most significant limit to future energy supplies is the "net energy" factor—the requirement that energy systems yield more energy than is invested in their construction and operation. There is a strong likelihood that future energy systems, both conventional and alternative, will have higher energy input costs than those that powered industrial societies during the last century. We will come back to this point repeatedly.

The report explores some of the presently proposed energy transition scenarios, showing why, up to this time, most are overly optimistic, as they do not address all of the relevant limiting factors to the expansion of alternative energy sources. Finally, it shows why energy conservation (using less energy, and also less resource materials) combined with humane, gradual population decline must become primary strategies for achieving sustainability.

* * *

The world's current energy regime is unsustainable. This is the recent, explicit conclusion of the International Energy Agency[1], and it is also the substance of a wide and growing public consensus ranging across the political spectrum. One broad segment of this consensus is concerned about the climate and the other environmental impacts of society's reliance on fossil fuels. The other is mainly troubled by questions regarding the security of future supplies of these fuels—which, as they deplete, are increasingly concentrated in only a few countries.

To say that our current energy regime is unsustainable means that it cannot continue and must therefore be replaced with something else. However, replacing the energy infrastructure of modern industrial societies will be no trivial matter. Decades have been spent building the current oil-coal-gas infrastructure, and trillions of dollars invested. Moreover, if the transition from current energy sources to

alternatives is wrongly managed, the consequences could be severe: there is an undeniable connection between per-capita levels of energy consumption and economic well-being.[3] A failure to supply sufficient energy, or energy of sufficient quality, could undermine the future welfare of humanity, while a failure to quickly make the transition away from fossil fuels could imperil the Earth's vital ecosystems.

Nonetheless, it remains a commonly held assumption that alternative energy sources capable of substituting for conventional fossil fuels are readily available—whether fossil (tar sands or oil shale), nuclear, or a long list of renewables—and ready to come on-line in a bigger way. All that is necessary, according to this view, is to invest sufficiently in them, and life will go on essentially as it is.

But is this really the case? Each energy source has highly specific characteristics. In fact, it has been the characteristics of our present energy sources (principally oil, coal, and natural gas) that have enabled the building of a modern society with high mobility, large population, and high economic growth rates. Can alternative energy sources perpetuate this kind of society? Alas, we think not.

While it is possible to point to innumerable successful alternative energy production installations within modern societies (ranging from small home-scale photovoltaic systems to large "farms" of three-megawatt wind turbines), it is not possible to point to more than a very few examples of an entire modern industrial nation obtaining the bulk of its energy from sources other than oil, coal, and natural gas. One such rare example is Sweden, which gets most of its energy from nuclear and hydropower. Another is Iceland, which benefits from unusually large domestic geothermal resources, not found in most other countries. Even in these two cases, the situation is more complex than it appears. The construction of the infrastructure for these power plants mostly relied on fossil fuels for the mining of the ores and raw materials, materials processing, transportation, manufacturing of components, the mining of uranium, construction energy, and so on. Thus for most of the world, a meaningful energy transition is still more theory than reality.

But if current primary energy sources are unsustainable, this implies a daunting problem. The transition to alternative sources *must* occur, or the world will lack sufficient energy to maintain basic services for its 6.8 billion people (and counting).

Thus it is vitally important that energy alternatives be evaluated thoroughly according to relevant criteria, and that a staged plan be formulated and funded for a systemic societal transition away from oil, coal, and natural gas and toward the alternative energy sources deemed most fully capable of supplying the kind of economic benefits we have been accustomed to from conventional fossil fuels.

By now, it is possible to assemble a bookshelf filled with reports from nonprofit environmental organizations and books from energy analysts, dating from the early 1970s to the present, all attempting to illuminate alternative energy transition pathways for the United States and the world as a whole. These plans and proposals vary in breadth and quality, and especially in their success at clearly identifying the factors that are limiting specific alternative energy sources from being able to adequately replace conventional fossil fuels.

It is a central purpose of this document to systematically review key limiting factors that are often left out of such analyses. We will begin that process in the next section. Following that, we will go further into depth on one key criterion: *net energy*, or *energy returned on energy invested* (EROEI). This measure focuses on the key question: All things considered, how much more energy does a system produce than is required to develop and operate that system? What is the ratio of energy *in* versus energy *out*? Some energy "sources" can be shown to produce little or no *net* energy. Others are only minimally positive.

Unfortunately, as we shall see in more detail below, research on EROEI continues to suffer from lack of standard measurement practices, and its use and implications remain widely misunderstood. Nevertheless, for the purposes of large-scale and long-range planning, net energy may be the most vital criterion for evaluating energy sources, as it so clearly reveals the tradeoffs involved in any shift to new energy sources.

This report is not intended to serve as a final authoritative, comprehensive analysis of available energy options, nor as a plan for a nation-wide or

global transition from fossil fuels to alternatives. While such analyses and plans are needed, they will require institutional resources and ongoing reassessment to be of value. The goal here is simply to identify and explain the primary criteria that should be used in such analyses and plans, with special emphasis on *net energy*, and to offer a cursory evaluation of currently available energy sources, using those criteria. This will provide a general, preliminary sense of whether alternative sources are up to the job of replacing fossil fuels; and if they are not, we can begin to explore what might be the fall-back strategy of governments and the other responsible institutions of modern society.

As we will see, the fundamental disturbing conclusion of the report is that there is little likelihood that either conventional fossil fuels or alternative energy sources can reliably be counted on to provide the amount and quality of energy that will be needed to sustain economic growth—or even current levels of economic activity—during the remainder of the current century.

This preliminary conclusion in turn suggests that a sensible transition energy plan will have to emphasize energy conservation above all. It also raises questions about the sustainability of growth *per se*, both in terms of human population numbers and economic activity.



As in South America, Africa's oil resources are a target for corporate giants like Shell. Indigenous communities are invaded by massive infrastructures in their forests and waters, bringing oil spills, forced removals, and military actions. In the Niger delta, where this warning sign turns away people from docks, nearly full-scale war has broken out between resisting indigenous groups, such as the Ogoni people, and global oil companies, seeking control of traditional lands.

GLOSSARY OF TERMS

CCS: Carbon Capture and Storage. When applied to coal, this still somewhat hypothetical set of technologies is often referred to as "clean coal." Many energy experts doubt that CCS can be deployed on a significant scale.

Carbon Dioxide, or CO_2: A colorless, odorless, incombustible gas, that is formed during respiration, combustion, and organic decomposition. Carbon dioxide is a minor natural constituent of Earth's atmosphere, but its abundance has increased substantially (from 280 parts per million to 387 ppm) since the beginning of the Industrial Revolution due to the burning of fossil fuels. CO_2 traps heat in Earth's atmosphere; as the concentration of the gas increases, the planet's temperature rises.

DDGS: Distillers Dried Grains with Solubles. A byproduct of producing ethanol from corn, DDGS is typically used as livestock feed.

Efficiency: The ratio between the useful *output* of an energy *conversion* machine and the *input*, in energy terms. When the useful output of conversion increases relative to input, the machine is considered more energy efficient. Typically *efficiency* applies to machines that use energy to do work (like cars or household electrical devices), or that convert energy from one form to another (like coal-burning power plants that make electricity). *Efficiency* differs from *EROEI* (see below), which typically describes the ratio between the broader energy inputs and outputs of an energy *production* system, such as a coalmine, a wind farm, or an operating oilfield. The distinction can be confusing, because sometimes both *efficiency* and *EROEI* can be applied to different aspects of the same energy system. For example, *efficiency* is used to describe the input/output of a photovoltaic solar panel (in terms of how much of the energy of sunlight is converted to electricity), while *EROEI* describes how much useful energy the panel will produce as compared to the amount of energy required to build and maintain it.

EGS: Enhanced Geothermal System. This refers to a fledgling technology that employs equipment developed by the oil and gas industry to pipe water deep below the surface, where the natural heat of Earth's crust turns it to steam that can turn a turbine.

EIA: Energy Information Administration, a branch of the U.S. Department of Energy.

Electricity: Energy made available by the flow of electric charge through a conductor.

Embodied energy: the available energy that was used in the work of making a product. This includes the activities needed to acquire natural resources, the energy used manufacturing and in making equipment and in other supporting functions—i.e., direct energy plus indirect energy.

Energy: The capacity of a physical system to do work, measured in joules or ergs. (See expanded definition, next page.)

Energy carrier: A substance (such as hydrogen) or phenomenon (such as electric current) that can be used to produce mechanical work or heat or to operate chemical or physical processes. In practical terms, this refers to a means of conveying energy from ultimate source to practical application. Our national system of electricity generating plants and power lines serves this function: it converts energy from coal, natural gas, uranium, flowing water, wind, or sunlight into a common carrier (electricity) that can be made widely available to accomplish a wide array of tasks.

EROEI: "Energy Returned on Energy Invested," also known as EROI (energy return on investment), is the ratio of the amount of usable energy acquired from a particular energy resource to the amount of energy expended to obtain that energy resource. Not to be confused with *efficiency* (see above).

Feed-in tariff: An incentive structure to encourage the adoption of renewable energy through government legislation. Regional or national electricity utilities become obligated to buy renewable electricity (from renewable sources such as solar photovoltaics, wind power, biomass, hydropower, and geothermal power) at constant, above-market rates set by the government.

Food energy: The amount of chemically stored energy present in food, usually measured in kilocalories (often written simply as "calories"). All animals require a mini-

mum periodic intake of food energy—as well as water and an array of specific nutrients (vitamins and minerals).

GHG: Greenhouse gases.

Horsepower: A unit of power originally intended to measure and compare the output of steam engines with the power output of draft horses. The definition of a horsepower unit varies in different applications (e.g., for rating boilers or electric motors); however, the most common definition, applying primarily to electric motors, is: a unit of power equal to 746 watts. Where units of horsepower are used for marketing consumer products, measurement methods are often designed by advertisers to maximize the magnitude of the number, even if it doesn't reflect the realistic capacity of the product to do work under normal conditions.

IEA: International Energy Agency. Headquartered in Paris, the IEA was created by the OECD nations after the oil shock of 1973 to monitor world energy supplies.

IGCC: Integrated Gasification Combined Cycle, an advanced type of coal power plant in which coal is brought together with water and air under high heat and pressure to produce a gas—synthesis gas (syngas), composed primarily of hydrogen and carbon monoxide—along with solid waste. It then removes impurities from the syngas before it is combusted.

IPCC: Intergovernmental Panel on Climate Change, a scientific body tasked to evaluate the risk of climate change caused by human activity. The panel was established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Program (UNEP). The IPCC shared the 2007 Nobel Peace Prize with Al Gore.

Joule: A unit of electrical energy equal to the work done when a current of one ampere passes through a resistance of one ohm for one second.

Mb/d: Millions of barrels per day.

Photovoltaic (PV): Producing a voltage when exposed to radiant energy (especially sunlight).

Net energy (sometimes referred to as Net Energy Gain or NEG): A concept used in energy economics that refers to the ratio between the energy expended to harvest an energy source and the amount of energy gained from that harvest.

Power: The rate of doing work, measured in watts (joules per second). (See Horsepower above.)

Transesterification: A process that converts animal fats or more commonly plant oils into biodiesel. In more technical terms: the reaction of a triglyceride (fat/oil) with an alcohol to form esters (a class of organic compounds formed from an organic acid and an alcohol) and glycerol (glycerine). The reaction is often catalyzed by the addition of a strong alkaline like sodium hydroxide (lye). The products of the reaction are mono-alkyl ester (biodiesel) and glycerol.

Trombe wall: A typical feature of passive solar design, a trombe wall is a very thick, south-facing wall that is painted black and made of a material that absorbs a lot of heat. A pane of glass or plastic glazing, installed a few inches in front of the wall, helps hold in the heat. The wall heats up slowly during the day. Then as it cools gradually during the night, it gives off its heat inside the building.

UCG: Underground coal gasification. Where practical, this technology could gasify coal more cheaply than above-ground IGCC power plants (gasification of coal is a stage in CCS, see above).

Watt: A unit of power equal to 1 joule per second.

Watt-hour: A unit of energy equal to the power of one watt operating for one hour.

Kilowatt (KW): Thousand watts.

KWH: Thousand watt-hours.

Megawatt (MW): Million watts.

MWH: Million watt-hours.

Gigawatt (GW): Billion watts.

GWH: Billion watt-hours.

Terawatt (TW): Trillion watts.

TWH: Trillion watt-hours.

Work: The transfer of energy from one physical system to another, especially the transfer of energy to a body by the application of a force that moves the body in the direction of the force. It is calculated as the product of the force and the distance through which the body moves and is expressed in joules, ergs, and foot-pounds.

WHAT IS "ENERGY"?

ENERGY IS OFTEN DEFINED as "the capacity of a physical system to do work," while work is said to be "force times distance traveled." But these definitions quickly become circular, as no one has seen "force" or "energy" apart from the effect that they have upon matter (which itself is difficult to define in the final analysis).

However hard it may be to define, we know that energy is the basis of everything: without it, nothing happens. Plants don't grow, cars don't move, and our homes get uncomfortably cold in the winter. Physicists may discuss energy in relation to stars and atoms, but energy is equally important to ecosystems and human economies: without sources of energy, living things die and economics grind to a halt.

Throughout history, most of the energy that humans have used has come to them in the form of food—the energy of sunlight captured and stored in plants (and in animals that eat plants). At the same time, humans have exerted energy, mostly by way of their muscles, in order to get what they wanted and needed, including food. It was essential that they harvested more food-energy than they expended in striving for it; otherwise, starvation resulted.

With animal domestication, primary energy still came by way of food, but much of that food (often of a sort that people couldn't eat) was fed to animals, whose muscles could be harnessed to pull plows, carts, and chariots.

People have also long used non-food energy by burning wood (a store of solar energy) for heat.

More recently, humans have found ways to "digest" energy that millions of years ago was chemically stored in the form of fossil fuels—"digesting" it not in their stomachs, but in the engines of machines that do work that human or animal muscles used to do; indeed, we have invented machines to do far more things than we were capable of previously, including work that human muscles could never do. Because fossil fuels represent energy stored in a more concentrated form than is found in the food we eat; because we can use fuel to power a great variety of machines; and because it has been possible to harvest fossil fuels in enormous and growing quantities, humankind has been able to build an interconnected global economy of unprecedented scope. However, fossil fuels are by their very nature finite, depleting resources. So, during recent decades enormous and increasing interest has been paid to the development of non-fossil, "alternative" energy sources.

Today, when we discuss national or global energy problems, we are mostly concerned about the energy for our machines. Most of the energy that humans use is still, in essence, solar energy—sunlight captured in food crops or forests; ancient sunlight stored in fossil fuels; sunlight heating air and fanning winds whose power can be harnessed with turbines; or sunlight transformed directly into electricity via photovoltaic panels. However, some non-solar forms of energy are also now available to us: tidal power captures the gravitational influence of the Moon and other celestial bodies; geothermal power uses Earth's heat, and nuclear power harnesses the energy given off by the decay of radioactive elements.

Even though we use more energy sources today than our ancestors did, and we use them in more ingenious and impressive ways, one vitally important principle still applies today as in the past, when our energy concerns had more directly to do with sunlight, green plants, and muscles: we must still expend energy to obtain energy, and our continued success as a species very much depends on our ability to obtain more energy from energy-harvesting efforts than we spend in those efforts.



LOU DEMATTEIS

Here's one benefit of the maze of pipelines and infrastructures driven through indigenous homelands in the Amazon; a daring new game for a young indigenous boy.



The leading sources of CO_2 emissions in the U.S. are coal-fired power plants like this one. There are increased efforts to regulate major greenhouse gas polluters, and new emphases on developing so-called "clean coal" technologies of carbon capture and "sequestration" (burial). But the benefits of these measures are uncertain, and sequestration is in its infancy. As with nuclear waste, the question becomes: how long can buried coal gases stay buried? That aside, most U.S. coal now comes from mountain-top removal mining (see back cover and chapter four) which is transforming the glorious mountains of several states into waste-lands, and will never qualify as "clean." In any case, coal reserves are far lower than have been reputed, making long term viability doubtful.

Two

NINE KEY CRITERIA: COMPARING ENERGY SYSTEMS AND THEIR LIMITS

IN EVALUATING ENERGY SOURCES, it is essential first to give attention to the criteria being used. Some criteria give us good information about an energy source's usefulness for specific applications. For example, an energy source like oil shale that is a solid material at room temperature and has low energy density per unit of weight and volume is highly unlikely to be good as a transport fuel unless it can first somehow profitably be turned into a liquid fuel with higher energy density (i.e., one that contains more energy per unit of weight or volume). Other criteria gauge the potential for a specific energy source to power large segments of an entire society. Micro-hydro power, for example, can be environmentally benign, but its yield cannot be sufficiently increased in scale to provide a significant portion of the national energy budget of the U.S. or other industrial countries.

In general, it is important to identify energy sources that are capable of being scaled up to produce large quantities of energy, that have high economic utility, and that have minimal environmental impacts, particularly those impacts having to do with land use and water requirements, as well as with greenhouse gas emissions. Only sources that pass these tests are capable of becoming our future *primary* energy sources—that is, ones capably of supplying energy on the scale that fossil fuels currently do.

The economic utility and scalability of any energy source are determined by three main factors: the size of the resource base, the energy density of the resource itself, and the quantity and nature of other resources and infrastructures needed to process and employ the energy source in question.

Economist Douglas Reynolds, in a paper discussing the energy density of energy sources (which he terms "energy grade"), writes:

> Energy is the driving force behind industrial production and is indeed the driving force behind any economic activity. However, if an economy's available energy resources have low grades, i.e. low potential productivity, then new technology will not be able to stimulate economic growth as much. On the other hand, high-grade energy resources could magnify the effect of technology and create tremendous economic growth. High-grade resources [i.e., ones that have high energy density] can act as magnifiers of technology, but low-grade resources can dampen the forcefulness of new technology. This leads to the conclusion that it is important to emphasize the role of the inherent nature of resources in economic growth more fully.[1]

But economic utility is not the only test an energy source must meet. If there is anything to be learned from the ongoing and worsening climate crisis, it is that the environmental impacts of energy sources must be taken very seriously indeed. The

world cannot afford to replace oil, coal, and gas with other energy sources that might pose a survival challenge to future generations.

So here, then, are nine energy evaluation criteria. In the section following this one, we will describe a tenth, net energy.

1. Direct Monetary Cost

This is the criterion to which most attention is normally paid. Clearly, energy must be affordable and competitively priced if it is to be useful to society. However, the immediate monetary cost of energy does not always reflect its *true* cost, as some energy sources may benefit from huge hidden state subsidies, or may have externalized costs (such as grave environmental impacts that later need correction). The monetary cost of energy resources is largely determined by the other criteria listed below.

The cost of energy typically includes factors such as the costs of resource extraction and refining or other resource modification or improvement, and transport. The repayment of investment in infrastructure (factories for building solar panels; nuclear power plants; refineries; and power lines, pipelines, and tankers) must also inevitably be reflected in energy prices.

However, prices can also be skewed by subsidies or restrictions of various kinds—including tax breaks to certain kinds of energy companies, pollution regulations, government investment in energy research and development, and government investment in infrastructure that favors the use of a particular kind of energy.

2. Dependence on Additional Resources

Very few energy sources come in an immediately useable form. One such example: Without exerting effort or employing any technology we can be warmed by the sunlight that falls on our shoulders on a spring day. In contrast, most energy sources, in order to be useful, require some method of gathering, mining, or processing fuels and then converting the resulting energy. In turn this usually entails some kind of apparatus, made of some kind of additional materials (for example, oil-drilling equipment is

TABLE 1A: TODAY'S ENERGY COST

Cost of existing power generation (cents per kWh)

Coal	2 to 4
Natural gas	4 to 7
Hydropower	1
Nuclear	2.9
Wind	4.5 to 10
Biomass power	4 to 9
Solar PV	21 to 83
Geothermal	10
Solar thermal	6 to 15
Tidal	10
Wave	12

Table 1A. These are approximate costs of production for eleven energy sources. (Residential electricity consumers typically pay from $.10 to $.20 per kWh.) Source: U.S. Federal Regulatory Commission, 2007.[1]

TABLE 1B: COST OF NEW ENERGY

Cost of new energy ($/kW)

Coal	1900-5800
Natural gas	500-1500
Hydropower	NA
Nuclear	4500-7500
Wind	1300-2500
Biomass power	NA
Solar PV	3900-9000
Geothermal	2600-3500
Solar thermal	3000-5000
Tidal	NA
Wave	NA

Table 1B. "New generation" refers to the infrastructure cost of introducing the capacity to produce one kilowatt on an ongoing basis; it does not refer to the cost of the actual generated power per kilowatt hour. Source: U.S. Federal Regulatory Commission, 2007.[1]

made from steel and diamonds). And sometimes the extraction or conversion process uses additional resources (for example, the production of synthetic diesel fuel from tar sands requires enormous quantities of water and natural gas, and the production of biofuels requires large quantities of water). The amount or scarcity of the added materials or resources, and the complexity and cost of the various apparatuses required at different stages, thus constitute important limiting factors on most modes of energy production.

The requirements for ancillary resources at early stages of production, in order to yield a given quantity of energy, are eventually reflected in the price paid for the energy. But this is not always or entirely the case. For example, many thin-film photovoltaic panels incorporate materials such as gallium and indium that are non-renewable and rare, and that are being depleted quickly. While the price of thin-film PV panels reflects and includes the current market price of these materials, it does not give much indication of future limits to the scaling up of thin-film PV resulting from these materials' scarcity.

3. Environmental Impacts

Virtually all energy sources entail environmental impacts, but some have greater impacts than others. These may occur during the acquisition of the resource (in mining coal or drilling for oil, for example), or during the release of carbon energy from the resource (as in burning wood, coal, oil, or natural gas). Other impacts occur in the conversion of the energy from one form to another (as in converting the kinetic energy of flowing water into electricity via dams and hydro-turbines); or in the potential for catastrophic events, as with nuclear energy production; or in waste disposal problems. Others may be intrinsic to the production process, such as injury to forests or topsoils from various forms of biofuels production.

Some environmental impacts are indirect and subtle. They can occur during the manufacture of the equipment used in energy harvesting or conversion. For example, the extraction and manipulation of resources used in manufacturing solar panels may entail significantly more environmental damage than the operation of the panels themselves.



AMAZON WATCH

4. Renewability

If we wish our society to continue using energy at industrial rates of flow not just for years or even decades into the future, but for centuries, then we will require energy sources that can be sustained more or less indefinitely. Energy resources like oil, natural gas, and coal are clearly non-renewable because the time required to form them through natural processes is measured in the tens of millions of years, while the quantities available will only be able to power society, at best, for only a few decades into the future at current rates of use. In contrast, solar photovoltaic and solar thermal energy sources rely on sunlight, which for all practical purposes is not depleting and will presumably be available in similar quantities a thousand years hence.

It is important to repeat once again, however, that the *equipment* used to capture solar or wind energy is not itself renewable, and that scarce, depleting, non-renewable resources and significant amounts of energy may be required to manufacture much crucial equipment.



Some energy sources *are* renewable yet are still capable of being depleted. For example, wood can be harvested from forests that regenerate themselves; however, the *rate* of harvest is crucial: if over-harvested, the trees will be unable to re-grow quickly enough and the forest will shrink and disappear.

Even energy sources that are renewable and that do not suffer depletion are nevertheless limited by the size of the resource base (as will be discussed next).

5. Potential Size or Scale of Contribution

Estimating the potential contribution of an energy source is obviously essential for macro-planning purposes, but such estimates are always subject to error—which can sometimes be enormous. With fossil fuels, amounts that can be reasonably expected to be extracted and used on the basis of current extraction technologies and fuel prices are classified as *reserves*, which are always a mere fraction of *resources* (defined as the total amount of the substance present in the ground). For example, the U.S. Geological Survey's first estimate of national coal reserves, completed in 1907, identified 5000 years' worth of supplies. In the decades since, most of those "reserves" have been reclassified as "resources." Reserves are downgraded to resources when new limiting factors are taken into account, such as (in the case of coal) seam thickness and depth, chemical impurities, and location of the deposit.

Today, only 250 years' worth of useable U.S. coal supplies are officially estimated to exist—a figure that is still probably much too optimistic (as the National Academy of Sciences concluded in its 2007 report, *Coal: Research and Development to Support National Energy Policy*).

On the other hand, reserves can sometimes grow as a result of the development of new extraction technologies, as has occurred in recent years with U.S. natural gas supplies: while the production of conventional American natural gas is declining, new underground fracturing technologies have enabled the recovery of "unconventional" gas from low-porosity rock, significantly increasing the national natural gas production rate and expanding U.S. gas reserves.

The estimation of reserves is especially difficult when dealing with energy resources that have little or no extraction history. This is the case, for example, with methane hydrates, regarding which various experts have issued a very wide range of estimates of both total resources and extractable future supplies. The same is also true of oil shale, and to a lesser degree tar sands, which have limited extraction histories.

Estimating potential supplies of renewable resources such as solar and wind power is likewise problematic, as many limiting factors are often initially overlooked. With regard to solar power, for example, a cursory examination of the ultimate resource is highly encouraging: the total amount of energy absorbed by Earth's atmosphere, oceans, and land masses from sunlight annually is approximately 3,850,000 exajoules (EJ)—whereas the world's human population uses currently only about 498 EJ of energy per year from all sources combined[6], an insignificant fraction of the previous figure. However, the factors limiting the amount of sunlight that can potentially be put to work for humanity are numerous, as we will see in more detail below.

Consider the case of methane harvested from municipal landfills. In this instance, using the resource

provides an environmental benefit: methane is a more powerful greenhouse gas than carbon dioxide, so harvesting and burning landfill gas (rather than letting it diffuse into the atmosphere) reduces climate impacts while also providing a local source of energy. If landfill gas could power the U.S. electrical grid, then the nation could cease mining and burning coal. However, the potential size of the landfill gas resource is woefully insufficient to support this. Currently the nation derives about 11 billion kWh per year from landfill gas for commercial, industrial, and electric utility uses. This figure could probably be doubled if more landfills were tapped. But U.S. electricity consumers use close to 200 times as much energy as that. There is another wrinkle: If society were to become more environmentally sensitive and energy efficient, the result would be that the amount of trash going into landfills would decline—and this would reduce the amount of energy that could be harvested from future landfills.

6. Location of the Resource

The fossil fuel industry has long faced the problem of "stranded gas"—natural gas reservoirs that exist far from pipelines and that are too small to justify building pipelines to access them. Many renewable resources often face similar inconveniences and costs caused by distance.

The locations of solar and wind installations are largely dictated by the availability of the primary energy source; but often, sun and wind are most abundant in sparsely populated areas. For example, in the U.S. there is tremendous potential for the development of wind resources in Montana and North and South Dakota; however, these are three of the least-populous states in the nation. Therefore, to take full advantage of these resources it will be necessary to ship the energy to more populated regions; this will typically require building new high-capacity long distance power lines, often at great expense, and causing sometimes severe environmental impacts. There are also excellent wind resources offshore along the Atlantic and Pacific coasts, nearer to large urban centers. But taking advantage of these resources will entail building and operating turbines in deep water and connecting them to the grid onshore—not an easy task. Similarly, the nation's best solar resources are located in the Southwest, far from population centers in the Northeast.

Thus, taking full advantage of these energy resources will require more than merely the construction of wind turbines and solar panels: much of the U.S. electricity grid will need to be reconfigured, and large-capacity, long-distance transmission lines will need to be constructed. Parallel challenges exist for other countries.

7. Reliability

Some energy sources are continuous: coal can be fed into a boiler at any desired rate, as long as the coal is available. But some energy sources, such as wind and solar, are subject to rapid and unpredictable fluctuations. Wind sometimes blows at greatest intensity at night, when electricity demand is lowest. The sun shines for the fewest hours per day during the winter—but consumers are unwilling to curtail electricity usage during winter months, and power system operators are required to assure security of supply throughout the day and year.

Intermittency of energy supply can be managed to a certain extent through storage systems—in effect, batteries. However, this implies yet further infrastructure costs as well as energy losses. It also places higher demands on control technology. In the worst instance, it means building much more electricity generation capacity than would otherwise be needed.*

8. Energy Density

A. Weight (or Gravimetric) Density

This refers to the amount of energy that can be derived from a standard weight unit of an energy resource.

For example, if we use the megajoule (MJ) as a measure of energy and the kilogram (kg) as a measure of weight, coal has about 20 to 35 MJ per kg, while natural gas has about 55 MJ/kg, and oil around 42 MJ/kg. (For comparison's sake, the amount of food that a typical weight-watching

American eats throughout the day weighs a little over a kilogram and has an energy value of about 10 MJ, or 2400 kilocalories.)

However, as will be discussed in more detail below, an electric battery typically is able to store and deliver only about 0.1 to 0.5 MJ/kg, and this is why electric batteries are problematic in transport applications: they are very heavy in relation to their energy output. Thus electric cars tend to have limited driving ranges and electric aircraft (which are quite rare) are able to carry only one or two people.

Consumers and producers are willing to pay a premium for energy resources with a higher energy density by weight; therefore it makes economic sense in some instances to convert a lower-density fuel such as coal into a higher-density fuel such as synthetic diesel, even though the conversion process entails both monetary and energy costs.

B. Volume (or Volumetric) Density

This refers to the amount of energy that can be derived from a given volume unit of an energy resource (e.g., MJ per liter).

Obviously, gaseous fuels will tend to have lower volumetric energy density than solid or liquid fuels. Natural gas has about .035 MJ per liter at sea level atmospheric pressure, and 6.2 MJ/l when pressurized to 200 atmospheres. Oil, though, can deliver about 37 MJ/l.

In most instances, weight density is more important than volume density; however, for certain applications the latter can be decisive. For example, fueling airliners with hydrogen, which has high energy density by weight, would be problematic because it is a highly diffuse gas at common temperatures and surface atmospheric pressure; indeed a hydrogen airliner would require very large tanks even if the hydrogen were super-cooled and highly pressurized.

The greater ease of transporting a fuel of higher volume density is reflected in the fact that oil moved by tanker is traded globally in large quantities, while the global tanker trade in natural gas is relatively small. Consumers and producers are willing to pay a premium for energy resources of higher volumetric density.

C. Area density

This expresses how much energy can be obtained from a given land area (e.g., an acre) when the energy resource is in its original state. For example, the area energy density of wood as it grows in a forest is roughly 1 to 5 million MJ per acre. The area grade for oil is usually tens or hundreds of millions of MJ per acre where it occurs, though oilfields are much rarer than forests (except perhaps in Saudi Arabia).

Area energy density matters because energy sources that are already highly concentrated in their original form generally require less investment and effort to be put to use. Douglas Reynolds makes the point:

> If the energy content of the resource is spread out, then it costs more to obtain the energy, because a firm has to use highly mobile extraction capital [machinery], which must be smaller and so cannot enjoy increasing returns to scale. If the energy is concentrated, then it costs less to obtain because a firm can use larger-scale immobile capital that can capture increasing returns to scale.[3]

Thus energy producers will be willing to pay an extra premium for energy resources that have high area density, such as oil that will be refined into gasoline, over ones that are more widely dispersed, such as corn that is meant to be made into ethanol.

9. Transportability

The transportability of energy is largely determined by the weight and volume density of the energy resource, as discussed above. But it is also affected by the state of the source material (assuming that it is a substance)—whether it is a solid, liquid, or gas. In general, a solid fuel is less convenient to transport than a gaseous fuel, because the latter can move by pipeline (pipelines can transport eight times the volume with a doubling of the size of the pipes). Liquids are the most convenient of all because they can likewise move through hoses and pipes, and they take up less space than gases.

Some energy sources cannot be classified as solid, liquid, or gas; they are energy fluxes. The energy from sunlight or wind cannot be directly transported; it must first be converted into a form that can—such as hydrogen or electricity.

Electricity is highly transportable, as it moves through wires, enabling it to be delivered not only to nearly every building in industrialized nations, but to many locations within each building.

Transporting energy always entails costs—whether it is the cost of hauling coal (which may account for over 70 percent of the delivered price of the fuel), the cost of building and maintaining pipelines and pumping oil or gas, or the cost of building and maintaining an electricity grid. Using the grid entails costs too, since energy is lost in transmission. These costs can be expressed in monetary terms or in energy terms, and they must also be included in calculations to determine net energy gains or losses, as we will be discussing in detail in the next section.

It is arguable that net energy should simply be presented as tenth in this list of limiting energy factors. However, we believe this factor is so important as to deserve a separate discussion.

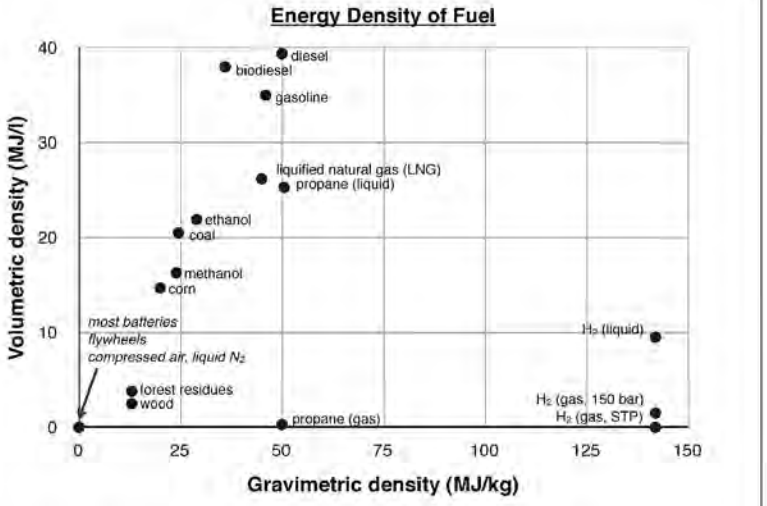


DIAGRAM 1: VOLUMETRIC AND GRAVIMETRIC DENSITY OF FUELS. *A hypothetical fuel with ideal energy density characteristics would occupy the upper right-hand corner of the diagram. Energy sources appearing in the lower left-hand corner have the worst energy density characteristics. H2 refers to hydrogen—as a super-cooled liquid, as a pressurized gas, and at "standard temperature and pressure."*



Possibly most promising among alternative renewable energies is windpower, already in wide use in northern Europe and parts of the U.S. "Net energy" for wind production tends to be higher than competitors, and potential future U.S. volume is substantial. A major problem is intermittency—wind does not always blow. Another is location and the need to cheaply transport the energy via power lines over long distances. Promising as it is, the total potential of wind, even combined with other alternative sources, remains below the level needed to sustain the present scale of industrial society. (See chapters two and three.)

Three

THE TENTH CRITERION: "*NET ENERGY*" (EROEI)

AS ALREADY MENTIONED, *net energy* refers to the ratio of the amount of energy produced to the amount of energy expended to produce it. Some energy must always be invested in order to obtain any new supplies of energy, regardless of the nature of the energy resource or the technology used to obtain it. Society relies on the net energy surplus gained from energy-harvesting efforts in order to operate all of its manufacturing, distribution, and maintenance systems.

Put slightly differently, net energy means the amount of useful energy that's left over after the amount of energy invested to drill, pipe, refine, or build infrastructure (including solar panels, wind turbines, dams, nuclear reactors, or drilling rigs) has been subtracted from the total amount of energy produced from a given source. If ten units of energy are "invested" to develop additional energy sources, then one hopes for 20 units or 50 or 100 units to result. "Energy out" must exceed "energy in," by as much as possible. Net energy is what's left over that can be employed to actually do further work. It can be thought of as the "profit" from the investment of energy resources in seeking new energy.

RETURNS ON INVESTMENTS (EROEI)

The net energy concept bears an obvious resemblance to a concept familiar to every economist or businessperson—*return on investment*, or *ROI*. Every investor knows that it takes money to make money; every business manager is keenly aware of the importance of maintaining a positive ROI; and every venture capitalist appreciates the potential profitability of a venture with a high ROI. Maintaining a positive *energy return on energy invested* (EROEI) is just as important for energy producers, and for society as a whole. (Some writers, wishing to avoid redundancy, prefer the simpler EROI; but since there is a strong likelihood for some readers to assume this means *energy returned on money invested*, we prefer the longer and more awkward term). The EROEI ratio is typically expressed as production per single unit of input, so 1 serves as the denominator of the ratio (e.g., 10/1 or 10:1). Sometimes the denominator is simply assumed, so it may be noted that the EROEI of the energy source is 10—meaning, once again, that ten units of energy are yielded for every one invested in the production process. An EROEI of less than 1—for example, .5 (which might also be written as .5/1 or .5:1) would indicate that the energy being yielded from a particular source is only half as much as the amount of energy being invested in the production process. As we will see, very low net energy returns may be expected for some recently touted new energy sources like cellulosic ethanol. And as we will also see, the net energy of formerly highly productive sources such as oil, and natural gas, which used to be more than 100:1, have steadily declined to a fraction of that ratio today.



Sometimes energy return on investment (EROEI) is discussed in terms of "energy payback time"—i.e., the amount of time required before an energy-producing system (such as an array of solar panels) will need to operate in order to produce as much energy as was expended to build and install the system. This formulation makes sense for systems (such as PV panels) that require little or nothing in the way of ongoing operational and maintenance costs once the system itself is in place.

REPLACEMENT OF HUMAN ENERGY

If we think of net energy not just as it impacts a particular energy production process, but as it impacts society as a whole, the subject takes on added importance.

When the net energy produced is a large fraction of total energy produced (for example, a net energy ratio of 100:1), this means that the great majority of the total energy produced can be used for purposes other than producing more energy. A relatively small portion of societal effort needs to be dedicated to energy production, and most of society's efforts can be directed toward activities that support a range of specialized occupations not associated with energy production. This is the situation we have become accustomed to as the result of having a century of access to cheap, abundant fossil fuels—all of which offered relatively high energy-return ratios for most of the 20th century.

On the other hand, if the net energy produced is a small fraction of total energy produced (for example a ratio of 10:1 or less), this means that a relatively large portion of available energy must be dedicated to further energy production, and only a small portion of society's available energy can be directed toward other goals. This principle applies regardless of the type of energy the society relies on—whether fossil energy or wind energy or energy in the form of food crops. For example, in a society where energy (in the form of food calories) is acquired principally through labor-intensive agriculture—which yields a low and variable energy "profit"—most of the population must be involved in farming in order to provide enough energy profit to maintain a small hierarchy of full-time managers, merchants, artists, government officials, soldiers, beggars, etc., who make up the rest of the society and who spend energy rather than producing it.

HEYDAY FOR FOSSIL FUELS

In the early decades of the fossil fuel era (the late 19th century through most of the 20th century), the quantities of both total energy *and* net energy that were liberated by mining and drilling for these fuels was unprecedented. It was this sudden abundance of cheap energy that enabled the growth of industrialization, specialization, urbanization, and globalization, which have dominated the past two centuries.

In that era it took only a trivial amount of effort in exploration, drilling, or mining to obtain an enormous energy return on energy invested (EROEI). At that time, the energy industry understandably followed the best-first or "low-hanging fruit" policy for exploration and extraction. Thus the coal, oil, and gas that were highest in quality and easiest to access tended to be found and extracted preferentially. But with every passing decade the net energy (as compared to total energy) derived from fossil fuel extraction has *declined* as energy producers have had to prospect in more inconvenient places and to rely on lower-grade resources. In the early days of the U.S. oil industry, for example, a 100-to-one energy profit ratio was common, while it is now estimated that current U.S. exploration efforts are

declining to an average one-to-one (break-even) energy payback rate[6].

In addition, as we will see in some detail later in this report, currently advocated alternatives to conventional fossil fuels generally have a much lower EROEI than coal, oil, or gas did in their respective heydays. For example, industrial ethanol production from corn is now estimated to have at best a 1.8:1 positive net energy balance[7]; it is therefore nearly useless as a primary energy source. (It is worth noting parenthetically that the calculation cited for ethanol may actually overstate the net energy gain of industrial ethanol because it includes the energy value of a production byproduct—distillers dried grains with solubles (DDGS), which can be fed to cattle—in the "energy out" column; but if the focus of the analysis is simply to assess the amount of energy used to produce one unit of corn ethanol, and the value of DDGS is thus disregarded, the EROEI is even lower, at 1.1, according to the same study.)

HOW EROEI SHAPES SOCIETY

As mentioned earlier, if the net energy profit available to society declines, a higher percentage of society's resources will have to be devoted directly to obtaining energy, thus increasing its cost. This means that less energy will be available for all of the activities that energy makes possible.

Net energy can be thought of in terms of the number of people in society that are required to engage in energy production, including food production. If energy returned exactly equals energy invested (EROEI = 1:1), then everyone must be involved in energy production activities and no one can be available to take care of society's other needs.

In pre-industrial societies, most of the energy collected was in the form of food energy, and most of the energy expended was in the form of muscle power (in the U.S., as recently as 1850, over 65 percent of all work being done was muscle-powered, versus less than 1 percent today, as fuel-fed machines do nearly all work). Nevertheless, exactly the same net-energy principle applied to these food-based energy systems as applies to our modern economy dominated by fuels, electricity, and machines. That is, people were harvesting energy from their environment (primarily in the form of food crops rather than fossil fuels), and that process itself required the investment of energy (primarily through the exertion of muscle power); success depended on the ability to produce more energy than was invested.

When most people were involved in energy production through growing or gathering food, societies were simpler by several measurable criteria: there were fewer specialized full-time occupations and fewer kinds of tools in use.

Archaeologist Lynn White once estimated that hunter-gatherer societies operated on a ten-to-one net energy basis (EROEI = 10:1).[8] In other words, for every unit of effort that early humans expended in hunting or wild plant gathering, they obtained an average of ten units of food energy in return. They used the surplus energy for all of the social activities (reproduction, child rearing, storytelling, and so on) that made life sustainable and rewarding.

Since hunter-gatherer societies are the simplest human groups in terms of technology and degree of social organization, 10:1 should probably be regarded as the minimum sustained average societal EROEI required for the maintenance of human existence (though groups of humans have no doubt survived for occasional periods, up to several years in duration, on much lower EROEI).

The higher complexity of early agrarian societies was funded not so much by increased EROEI as by higher levels of energy investment in the form of labor (farmers typically work more than hunters and gatherers) together with the introduction of food storage, slavery, animal domestication, and certain key tools such as the plow and the yoke. However, the transition to industrial society, which entails much greater levels of complexity, could only have been possible with both the higher total energy inputs, and the much higher EROEI, afforded by fossil fuels.

EROEI LIMITS ENERGY OPTIONS

Both renewable and non-renewable sources of energy are subject to the net energy principle. Fossil fuels become useless as energy sources when the energy required to extract them equals or exceeds the energy that can be derived from burning them.

This fact puts a physical limit to the portion of resources of coal, oil, or gas that should be categorized as reserves, since net energy will decline to the break-even point long before otherwise extractable fossil energy reserves are exhausted.

Therefore, the need for society to find replacements for fossil fuels may be more urgent than is generally recognized. Even though large amounts of fossil fuels remain to be extracted, the transition to alternative energy sources must be negotiated while there is still sufficient net energy available to continue powering society while at the same time providing energy for the transition process itself.



Net energy may have a direct effect on our ability to maintain industrial society at its present level. If the net energy for all combined energy sources declines, increasing constraints will be felt on economic growth, but also upon new adaptive strategies to deal with the current climate and energy crises. For example, any kind of adaptive energy transition will demand substantial new investments for the construction of more energy-efficient buildings and/or public transport infrastructure. However, such requirements will come at the same time that substantially more investment will be needed in energy production systems. Societies may simply be unable to adequately fund both sets of needs simultaneously. Noticeable symptoms of strain would include rising costs of bare necessities and a reduction in job opportunities in fields not associated with basic production. Supplying the energy required simply to maintain existing infrastructure, or to maintain aspects of that infrastructure deemed essential, would become increasingly challenging.

EROEI: DISTINCT FROM EFFICIENCY

The EROEI of energy *production* processes should not be confused with the efficiency of energy *conversion* processes, i.e., the conversion of energy from fossil fuel sources, or wind, etc., into useable electricity or useful work. Energy conversion is always less than 100 percent efficient—some energy is invariably wasted in the process (energy cannot be destroyed, but it can easily be dissipated so as to become useless for human purposes)—but conversion processes are nevertheless crucial in using energy. For example, in an energy system with many source inputs, common *energy carriers* are extremely helpful. Electricity is currently the dominant energy carrier, and serves this function well. It would be difficult for consumers to make practical use of coal, nuclear energy, and hydropower without electricity. But *conversion* of the original source energy of fossil fuels, uranium, or flowing water into electricity entails an energy cost. It is the objective of engineers to reduce that energy cost so as to make the conversion as efficient as possible. But if the energy source has desirable characteristics, even a relatively high conversion cost, in terms of "lost" energy, may be easily borne. Many coal power plants now in operation in the U.S. have an energy conversion efficiency of only 35 percent.

Similarly, some engines and motors are more efficient than others in terms of their ability to turn energy into work.

EROEI analysis does not focus on conversion efficiency *per se*, but instead takes into account all reasonable costs on the "energy invested" side of the ledger for energy *production* (such as the energy required for mining or drilling, and for the building of infrastructure), and then weighs that total against the amount of energy being delivered to accomplish work.

Because this report is a layperson's guide, we cannot address in any depth the technical process of calculating net energy.

NET ENERGY EVALUATION: IMPRECISE BUT ESSENTIAL FOR PLANNING

The use of net energy or EROEI as a criterion for evaluating energy sources has been criticized on several counts.[13] The primary criticism centers on the difficulty in establishing system boundaries that are agreeable to all interested parties, and that can easily be translated from analyzing one energy source to another. Moreover, the EROEI of some energy sources (such as wind, solar, and geothermal) may vary greatly according to the location of the resources versus their ultimate markets. Advances in the efficiency of supporting technology can also affect net energy. All of these factors make it difficult to calculate figures that can reliably be used in energy planning.

This difficulty only increases as the examination of energy production processes becomes more detailed: Does the office staff of a drilling company actually *need* to drive to the office to produce oil? Does the kind of car matter? Is the energy spent filing tax returns actually necessary to the manufacture of solar panels? While such energy costs are usually not included in EROEI analysis, some might argue that all such ancillary costs should be factored in, to get more of a full picture of the tradeoffs.[14]

Yet despite challenges in precisely accounting for the energy used in order to produce energy, net energy factors act as a real constraint in human society, regardless of whether we ignore them or pay close attention to them, because EROEI will determine if an energy source is able successfully to support a society of a certain size and level of complexity. Which alternative technologies have sufficiently high net energy ratios to help sustain industrial society as we have known it for the past century? Do any? Or does a combination of alternatives? Even though there is dispute as to exact figures, in situations where EROEI can be determined to be very low we can conclude that the energy source in question cannot be relied upon as a primary source to support an industrial economy.

Many criticisms of net energy analysis boil down to an insistence that other factors that limit the efficacy of energy sources should also be considered. We agree. For example, EROEI does not account for limits to *non-energy* inputs in energy production (such as water, soil, or the minerals and metals needed to produce equipment); it does not account for undesirable non-energy outputs of the energy production process—most notably, greenhouse gases; it does not account for energy quality (the fact, for example, that electricity is an inherently more versatile and useful energy delivery medium than the muscle power of horses); and it does not reflect the scalability of the energy source (recall the example of landfill gas above).

Energy returns *could* be calculated to include the use of non-energy inputs—e.g., Energy Return on *Water* Invested, or Energy Return on *Land* Invested. As net energy declines, the energy return from the investment of non-energy inputs is also likely to decline, perhaps even faster. For example, when fuel is derived from tar sands rather than from conventional oil fields, more land and water are needed as inputs; there is an equivalent situation when substituting biofuels for gasoline. Once society enters a single-digit average EROEI era, i.e., less than 10:1 energy output vs. input, a higher percentage of energy *and* non-energy resources (water, labor, land, and so on) will have to be devoted to energy production. This is relevant to the discussion of biofuels and similar low energy-gain technologies. At first consideration, they may seem better than fossil fuels since they are produced from renewable sources, but they use non-renewable energy inputs that have a declining net yield (as higher-quality resources are depleted). They may require large amounts of land, water, and fertilizer; and they often entail environmental damage (as fossil fuels themselves do). All proposed new sources of energy should be evaluated in a framework that considers these other factors (energy return on water, land, labor, etc.) as well as net energy.[15] Or, conceivably, a new multi-faceted EROEI could be devised.

In any case, while net energy is not the only important criterion for assessing a potential energy source, this is not a valid reason to ignore it. EROEI is a necessary—though not a complete—basis for evaluating energy sources. It is one of *five* criteria that we believe should be regarded as having make-or-break status. The other critical criteria, already

discussed in Part I. above, are: renewability, environmental impact, size of the resource, and the need for ancillary resources and materials. If a potential energy source cannot score well with all five of these criteria, it cannot realistically be considered as a future primary energy source. Stated the other way around, a potential primary energy source can be disqualified by doing very poorly with regard to just one of these five criteria.

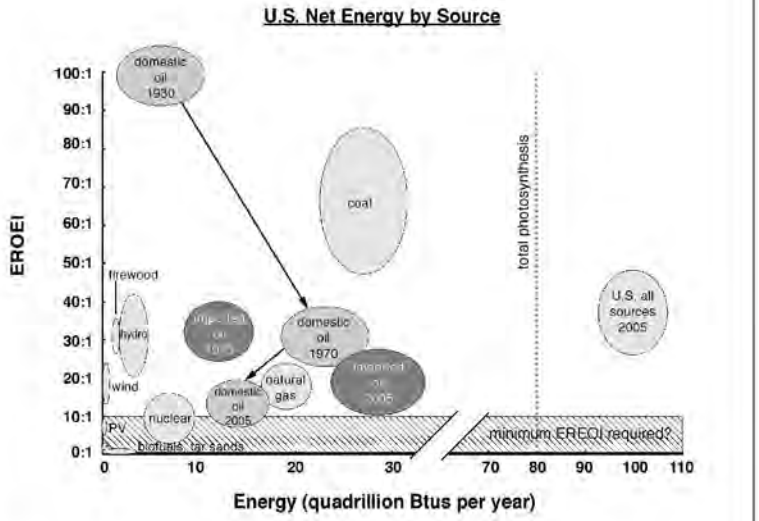


DIAGRAM 2: THE NET ENERGY (AND MAGNITUDE OF CONTRIBUTION) OF U.S. ENERGY SOURCES

This "balloon graph" of U.S. energy supplies developed by Charles Hall, Syracuse University, represents net energy (vertical axis) and quantity used (horizontal axis) of various energy sources at various times. Arrows show the evolution of domestic oil in terms of EROEI and quantity produced (in 1930, 1970, and 2005), illustrating the historic decline of EROEI for U.S. domestic oil. A similar track for imported oil is also shown. The size of each "balloon" represents the uncertainty associated with EROEI estimates. For example, natural gas has an EROEI estimated at between 10:1 and 20:1 and yields nearly 20 quadrillion Btus (or 20 exajoules). "Total photosynthesis" refers to the total amount of solar energy captured annually by all the green plants in the U.S. including forests, food crops, lawns, etc. (note that the U.S. consumed significantly more than this amount in 2005). The total amount of energy consumed in the U.S. in 2005 was about 100 quadrillion Btus, or 100 exajoules; the average EROEI for all energy provided was between 25:1 and 45:1 (with allowance for uncertainty). The shaded area at the bottom of the graph represents the estimated minimum EROEI required to sustain modern industrial society: Charles Hall suggests 5:1 as a minimum, though the figure may well be in the range of 10:1."



RODRIGO BUENDIA/AFP/GETTY IMAGES

In the Ecuadorian and Peruvian Amazon, indigenous people such as the Achuar, are routinely confronted with oil spills in rivers (such as this one), and runoffs into lakes and forests; pipelines shoved through traditional lands, oil fires, gas excursions, waste dumping, smoke, haze and other pollutants as daily occurrences, leading to very high cancer rates, and community breakdowns similar to those in the Niger delta, Indonesia and elsewhere. Achuar communities have been massively protesting, and recently successful lawsuits against Chevron and Texaco have made international headlines.



USAF ARCHIVES

This giant photovoltaic array—70,000 panels on 140 acres of Nellis Airforce base in Nevada—leads sci-fi types to fantasize much larger arrays in space, or mid-ocean, but solar comes in all sizes. Other kinds of systems include "concentrating solar thermal" and passive solar, as used in many private homes. With sunlight as the resource, planetary supply is unlimited. But, it's intermittent on cloudy days, and often seasonally, reducing its reliability as a large scale primary energy, compared to operator-controlled systems like coal, gas, or nuclear. Other limits include materials costs and shortages and relatively low "net energy" ratios.

Four

ASSESSING & COMPARING EIGHTEEN ENERGY SOURCES

IN THIS CHAPTER, we will discuss and compare in further detail key attributes, both positive and negative, of eighteen specific energy sources. The data on net energy (EROEI) for most of these are drawn largely from the work of Dr. Charles Hall, who, together with his students at the State University of New York in Syracuse, has for many years been at the forefront of developing and applying the methodology for calculating energy return ratios.[1]

We will begin by considering presently dominant energy sources, case-by-case, including oil, coal, and gas so that comparisons can be made with their potential replacements. After fossil fuels we will explore the prospects for various non-fossil sources. Altogether, eighteen energy sources are discussed in this section, listed approximately in the order of the size of their current contribution to world energy supply.

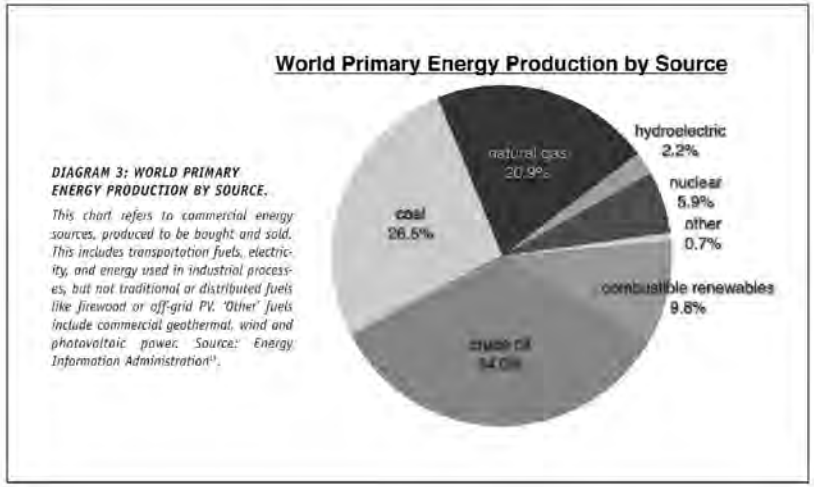


DIAGRAM 3: WORLD PRIMARY ENERGY PRODUCTION BY SOURCE.

This chart refers to commercial energy sources, produced to be bought and sold. This includes transportation fuels, electricity, and energy used in industrial processes, but not traditional or distributed fuels like firewood or off-grid PV. 'Other' fuels include commercial geothermal, wind and photovoltaic power. Source: Energy Information Administration[2].

1. OIL



WALTER BIBIKOW/JAI/CORBIS

As the world's current largest energy source, oil fuels nearly all global transportation—cars, planes, trains, and ships. (The exceptions, such as electric cars, subways and trains, and sailing ships, make up a statistically insignificant portion of all transport). Petroleum provides about 34 percent of total world energy, or about 181 EJ per year. The world currently uses about 75 million barrels of crude oil per day, or 27 billion barrels per year[17], and reserves amount to about one trillion barrels (though the figure is disputed).

PLUS: Petroleum has become so widely relied upon because of several of its most basic characteristics: It is highly transportable as a liquid at room temperature and is easily stored. And it is energy dense—a liter of oil packs 38 MJ of chemical energy, as much energy as is expended by a person working two weeks of 10-hour days.[20]

Historically, oil has been cheap to produce, and can be procured from a very small land footprint.

MINUS: Oil's downsides are as plain as its advantages.

Its negative environmental impacts are massive. Extraction is especially damaging in poorer nations such as Ecuador, Peru, and Nigeria, where the industry tends to spend minimally on the kinds of remediation efforts that are required by law in the U.S.; as a result, rivers and wetlands are poisoned, air is polluted, and indigenous people see their ways of life devastated.

Meanwhile, burning oil releases climate-changing carbon dioxide (about 800 to 1000 lbs of CO_2 per barrel[21], or 70 kg of CO_2 per GJ), as well as other pollutants such as nitrogen oxides and particulates.

Most importantly, oil is non-renewable, and many of the world's largest oilfields are already significantly depleted. Most oil-producing nations are seeing declining rates of extraction, and future sources of the fuel are increasingly concentrated in just a few countries—principally, the members of the Organization of Petroleum Exporting Countries (OPEC). The geographic scarcity of oil deposits has led to competition for supplies, and sometimes to war over access to the resource. As oil becomes scarcer due to depletion, we can anticipate even worse oil wars.[22]

EROEI: The net energy (compared to gross energy) from global oil production is difficult to ascertain precisely, because many of the major producing nations do not readily divulge statistics that would make detailed calculations possible. About 750 joules of energy are required to lift 15 kg of oil 5 meters—an absolute minimum energy investment for pumping oil that no longer simply flows out of the ground under pressure (though much of the world's oil still does). But energy is also expended in exploration, drilling, refining, and so on. An approximate total number can be derived by dividing the energy produced by the global oil industry by *the energy equivalent of the dollars spent* by the oil industry for exploration and production (this is a rough calculation of the amount of energy used in the economy to produce a dollar's worth of goods and services). According to Charles Hall, this number—for oil and gas together—was about 23:1 in 1992, increased to about 32:1 in 1999, and has since declined steadily, reaching 19:1 in 2005. If the recent trajectory is projected forward, the EROEI for global oil and gas would decline to 10:1 soon after 2010. Hall and associates find that for the U.S. (a nation whose oil industry investments and oil production statistics are fairly transparent), EROEI at the wellhead was roughly 26:1 in 1992, increased to 35:1 in 1999, and then declined to 18:1 in 2006.[23]

It is important to remember that Hall's 19:1 estimate for the world as a whole is an average: some producers enjoy much higher net energy gains than others. There are good reasons to assume that most of the high-EROEI oil producers are OPEC-member nations.

PROSPECTS: As mentioned, oil production is in decline in most producing countries, and nearly all the world's largest oilfields are seeing falling production. The all-time peak of global oil production probably occurred in July, 2008 at 75 million barrels per day.[24] At the time, the per-barrel price had skyrocketed to its all-time high of $147. Since then, declining demand and falling price have led producing nations to cut back on pumping. Declining price has also led to a significant slowing of investment in exploration and production, which virtually guarantees production shortfalls in the future. It therefore seems unlikely that the July 2008 rate of production will ever be exceeded.

Declining EROEI and limits to global oil production will therefore constrain future world economic activity unless alternatives to oil can be found and brought on line extremely rapidly.

2. COAL



The Industrial Revolution was largely made possible by energy from coal. In addition to being the primary fuel for expanding manufacturing, it was also used for space heating and cooking. Today, most coal is burned for the production of electricity and for making steel.

Coal has been the fastest-growing energy source (by quantity) in recent years due to prodigious consumption growth in China, which is by far the world's foremost producer and user of the fuel. The world's principal coal deposits are located in the U.S., Russia, India, China, Australia, and South Africa. World coal reserves are estimated at 850 billion metric tons (though this figure is disputed), with annual production running at just over four billion tons. Coal produces 134.6 EJ annually, or 27 percent of total world energy. The U.S. relies on coal for 49 percent of its electricity and 23 percent of total energy.[25]

Coal's energy density by weight is highly variable (from 30 MJ/kg for high-quality anthracite to as little as 5.5 MJ/kg for lignite).

PLUS: Coal currently is a cheap, reliable fuel for the production of electricity. It is easily stored, though bulky. It is transportable by train and ship (transport by truck for long distances is rarely feasible from an energy and economic point of view).

MINUS: Coal has the worst environmental impacts of any of the conventional fossil fuels, both in the process of obtaining the fuel (mining) and in that of burning it to release energy. Because coal is the most carbon-intensive of the conventional fossil fuels (94 kg of CO_2 are emitted for every GJ of energy produced), it is the primary source of greenhouse gas emissions leading to climate change, even though it contributes less energy to the world economy than petroleum does.

Coal is non-renewable, and some nations (U.K. and Germany) have already used up most of their original coal reserves. Even the U.S., the "Saudi Arabia of coal," is seeing declining production from its highest-quality deposits.

EROEI: In the early 20th century, the net energy from U.S. coal was very high, at an average of 177:1 according to one study[26], but it has fallen substantially to a range of 50:1 to 85:1. Moreover, the decline is continuing, with one estimate suggesting that by 2040 the EROEI for U.S. coal will be 0.5:1[27].

PROSPECTS: While official reserves figures imply that world coal supplies will be sufficient for a century or more, recent studies suggest that supply limits may appear globally, and especially regionally, much sooner. According to a 2007 study by Energy Watch Group of Germany, world coal production is likely to peak around 2025 or 2030, with a gradual decline thereafter. China's production peak could come sooner if economic growth (and hence energy demand growth) returns soon. For the U.S., coal production may peak in the period 2030 to 2035.

New coal technologies such as carbon capture and storage (CCS) could theoretically reduce the climate impact of coal, but at a significant economic and energy cost (by one estimate, up to 40 percent of the energy from coal would go toward mitigating climate impact, with the other 60 percent being available for economically useful work; there would also be an environmental cost from damage due to additional mining required to produce the extra coal needed to make up for the energy costs from CCS).[28]

Coal prices increased substantially in 2007–2008 as the global economy heated up, which suggests that the existing global coal supply system was then near its limit. Prices have declined sharply since then as a result of the world economic crisis and falling energy demand. However, prices for coal will almost certainly increase in the future, in inflation- or deflation-adjusted terms, as high-quality deposits are exhausted and when energy demand recovers from its lowered level due to the current recession.

3. NATURAL GAS



GAS FLARE AT NATURAL GAS PLANT STOCK

Formed by geological processes similar to those that produced oil, natural gas often occurs together with liquid petroleum. In the early years of the oil industry, gas was simply flared (burned at the wellhead); today, it is regarded as a valuable energy resource and is used globally for space heating and cooking; it also has many industrial uses where high temperatures are needed, and it is increasingly burned to generate electricity. Of the world's total energy, natural gas supplies 25 percent; global reserves amount to about 6300 trillion cubic feet, which represents an amount of energy equivalent to 890 billion barrels of oil.[29]

PLUS: Natural gas is the least carbon-intensive of the fossil fuels (about 53 kg CO_2 per GJ). Like oil, natural gas is energy dense (more so by weight than by volume), and is extracted from a small land footprint. It is easily transported through systems of pipelines and pumps, though it cannot be transported by ship as conveniently as oil, as this typically requires pressurization at very low temperatures.

MINUS: Natural gas is a hydrocarbon fuel, which means that burning it releases CO_2 even if the amounts are less than would be the case to yield a similar amount of energy from coal or oil. Like oil, natural gas is non-renewable and depleting. Environmental impacts from the production of natural gas are similar to those with oil. Recent disputes between Russia, Ukraine, and Europe over Russian natural gas supplies underscore the increasing geopolitical competition for access to this valuable resource. International transport and trade of liquefied natural gas (LNG) entails siting and building offloading terminals that can be extremely hazardous.

EROEI: The net energy of global natural gas is even more difficult to calculate than that of oil, because oil and gas statistics are often aggregated. A recent study that incorporates both direct energy (diesel fuel used in drilling and completing a well) and indirect energy (used to produce materials like steel and cement consumed in the drilling process) found that as of 2005, the EROEI for U.S. gas fields was 10:1.[30] However, newer "unconventional" natural gas extraction technologies (coal-bed methane and production from low-porosity reservoirs using "fracing" technology) probably have significantly lower net energy yields: the technology itself is more energy-intensive to produce and use, and the wells deplete quickly, thus requiring increased drilling rates to yield equivalent amounts of gas. Thus as conventional gas depletes and unconventional gas makes up a greater share of total production, the EROEI of natural gas production in North America will decline, possibly dramatically.

PROSPECTS: During the past few years, North America has averted a natural gas supply

crisis as a result of the deployment of new production technologies, but it is unclear how long the reprieve will last given the (presumably) low EROEI of these production techniques and the fact that the best unconventional deposits, such as the Barnett shales of Texas, are being exploited first. European gas production is declining and Europe's reliance on Russian gas is increasing—but it is difficult to tell how long Russia can maintain current flow rates.

In short, while natural gas has fewer environmental impacts than the other fossil fuels, especially coal, its future is clouded by supply issues and declining EROEI.

4. HYDROPOWER



Hydropower is electric current produced from the kinetic energy of flowing water. Water's gravitational energy is relatively easily captured, and relatively easily stored behind a dam. Hydro projects may be enormous (as with China's Three Gorges Dam) or very small ("microhydro") in scale. Large projects typically involve a dam, a reservoir, tunnels, and turbines; small-scale projects usually simply employ the "run of the river," harnessing energy from a river's natural flow, without water storage.

Hydropower currently provides 2,894 Terawatt hours (TWh) of electricity annually worldwide, and about 264 TWh in the U.S.; of all *electrical* energy, hydropower supplies 19 percent worldwide (with 15 percent coming from large hydropower), and 6.5 percent in the U.S. This represents 6 percent of total energy globally and 3 percent nationally.[3]

PLUS: Unlike fossil energy sources, with hydropower most energy and financial investment occurs during project construction, while very little is required for maintenance and operations. Therefore electricity from hydro is generally cheaper than electricity from other sources, which may cost two to three times as much to generate.

MINUS: Energy analysts and environmentalists are divided on the environmental impacts of hydropower. Proponents of hydropower see it as a clean, renewable source of energy with only moderate environmental or social impacts. Detractors of hydropower see it as having environmental impacts as large as, or larger than, those of some conventional fossil fuels. Global impacts include carbon emissions primarily during dam and reservoir construction and methane releases from the drowned vegetation. Regional impacts result from reservoir creation, dam construction, water quality changes, and destruction of native habitat. The amount of carbon emissions produced is very site-specific and substantially lower than from fossil fuel sources. Much of the debate about hydropower centers on its effects on society, and whether or not a constant supply of water for power, irrigation, or drinking justifies the occasional requirement to relocate millions of people. Altogether, large dam and reservoir construction projects have required relocations of about 40 to 80 million people during the last century. Dam failure or collapse is also a risk in some cases, especially in China.

EROEI: Hydropower's EROEI ranges roughly from 11.2:1 to 267:1, varying enormously by site. Because hydropower is such a variable resource, used in many different geographical conditions and involving various technologies, one generalized EROEI ratio cannot describe all projects. The EROEI for favorable or even moderate sites can be extremely high, even where environmental and social impacts are severe.

PROSPECTS: Globally, there are many undeveloped dam sites with hydropower potential, though there are few in the U.S., where most of the best sites have already been developed. Theoretically, hydropower could be accessible at some level to any population near a constant supply of flowing water.

The International Hydropower Association estimates that about one-third of the realistic potential of world hydropower has been developed. In practice, the low direct investment cost of fossil fuels, combined with the environmental and social consequences of dams, have meant that fossil fuel-powered projects are much more common.

Dams have the potential to produce a moderate amount of additional, high-quality electricity in less-industrialized countries, but continue to be associated with extremely high environmental and social costs. Many authors see "run-of-river" hydropower (in which dams are not constructed) as the alternative future, because this does away with the need for massive relocation projects, minimizes the impacts on fish and wildlife, and does not release greenhouse gases (because there is generally no reservoir), while it retains the benefits of a clean, renewable, cheap source of energy. However, the relatively low power density of this approach limits its potential.

5. NUCLEAR

Electricity from controlled nuclear fission reactions has long been a highly contentious source of energy. Currently, 439 commercial power-generating reactors are operating worldwide, 104 of them in the U.S. Collectively they produced 2,658 TWh world-wide in 2006, and 806 TWh in the U.S. This represents about 6 percent of world energy, 8 percent of all energy consumed in the U.S., and 19 percent of U.S. electricity.[32]

All commercial reactors in the U.S. are variants of light water reactors. Other designs continue to be subjects of research.

PLUS: Nuclear electricity is reliable and relatively cheap (with an average generating cost of 2.9 cents per kW/h) once the reactor is in place and operating. In the U.S., while no new nuclear power plants have been built in many years, the amount of nuclear electricity provided has grown during the past decade due to the increased efficiency and reliability of existing reactors.

The nuclear cycle emits much less CO_2 than the burning of coal to produce an equivalent amount of energy (though it is important to add that uranium mining and enrichment, and plant construction, still entail considerable carbon emissions). This reduced CO_2 emission rate has led some climate protection spokespeople to favor nuclear power, at least as a temporary bridge to an "all-renewable" energy future.

MINUS: Uranium, the fuel for the nuclear cycle, is a *not* a renewable resource. The peak of world uranium production is likely to occur between 2040 and 2050[33], which means that nuclear fuel is likely to become more scarce and expensive during the next few decades. Already, the average grade of uranium ore mined has declined substantially in recent years as the best reserves have been depleted. Recycling of fuel and the employment of alternative nuclear fuels are possible, but the needed technology has not been adequately developed.

Nuclear power plants are extremely costly to build, so much so that unsubsidized nuclear plants are not economically competitive with similar-sized fossil-fuel plants. Government subsidies in the U.S. include: *(1)* those from the military nuclear industry, *(2)* non-military government subsidies, and *(3)* artificially low insurance costs. New power plants also typically entail many years of delay for design, financing, permitting, and construction.

The nuclear fuel cycle also brings substantial environmental impacts, which may be even greater during the mining and processing stages than during plant operation even when radiation-releasing accidents are taken into account. Mining entails ecosystem removal, the release of dust, the production of large amounts of tailings (equivalent to 100 to 1,000 times the quantity of uranium extracted), and the leaching of radiation-emitting particles into groundwater. During plant operation, accidents causing small to large releases of radiation can impact the local environment or much larger geographic areas, potentially making land uninhabitable (as occurred with the explosion and radiation leakage in the Chernobyl reactor in the former Soviet Union in 1986).

Storage of radioactive waste is also highly problematic. High-level waste (like spent fuel) is much more radioactive and difficult to deal with than low-level waste, and must be stored onsite for several years before transferal to a geological repository.

So far, the best-known way to deal with waste, which contains doses of radiation lethal for thou-

sands of years, is to store it in a geological repository, deep underground. The long-proposed site at Yucca Mountain in Nevada, the only site that has been investigated as a repository in the U.S., has recently been canceled. Even if the Yucca Mountain site had gone ahead, it would not have been sufficient to store the U.S. waste already awaiting permanent storage. More candidate repository sites will need to be identified soon if the use of nuclear power is to be expanded in the U.S. Even in the case of ideal sites, over thousands of years waste could leak into the water table. The issue is controversial even after extremely expensive and extensive analyses by the Department of Energy.

Nearly all commercial reactors use water as a coolant. As water cools the reactor, the water itself becomes warmed. When heated water is then discharged back into lakes, rivers, or oceans the resultant heat pollution can disrupt aquatic habitats.

During the 2003 heat wave in France, several nuclear plants were shut because the river water was too hot. And in recent years, a few reactors have had to be shut down due to water shortages, highlighting a future vulnerability of this technology in a world where over-use of water and extreme droughts from climate change are becoming more common.

Reactors must not be sited in earthquake-prone regions due to the potential for catastrophic radiation release in the event of a serious quake. Nuclear reactors are often cited as potential terrorist targets and as potential sources of radioactive materials for the production of terrorist "dirty bombs."

EROEI: A review by Charles Hall *et al.*[11] of net energy studies of nuclear power that have been published to date found the information to be "idiosyncratic, prejudiced, and poorly documented." The largest issue is determining what the appropriate boundaries of analysis should be. The review concluded that the most reliable EROEI information is quite old (showing results in the range of 5 to 8:1), while newer information is either highly optimistic (15:1 or more) or pessimistic (low, even less than 1:1). An early study cited by Hall indicated that the high energy inputs during the construction phase are one of the major reasons for the low EROEI—which also means there are substantial greenhouse gas (GHG) emissions during construction.



NUCLEAR WASTE STORAGE FACILITY, YUCCA MT., NEVADA. IKKNIAZKOW/GETTY IMAGES

PROSPECTS: The nuclear power industry is set to grow, with ten to twenty new power plants being considered in the U.S. alone. But the scale of growth is likely to be constrained mostly for reasons discussed above.

Hopes for a large-scale deployment of new nuclear plants rest on the development of new technologies: pebble-bed and modular reactors, fuel recycling, and the use of thorium as a fuel. The ultimate technological breakthrough for nuclear power would be the development of a commercial fusion reactor. However, each of these new technologies is problematic for some reason. Fusion is still decades away and will require much costly research. The technology to extract useful energy from thorium is highly promising, but will require many years and expensive research and development to commercialize. The only breeder reactors in existence are either closed, soon to be closed, abandoned, or awaiting re-opening after serious accidents. Examples of problematic breeders include BN-600 (in Russia, which will end its life by 2010); Clinch River Breeder Reactor (in the U.S., construction abandoned in 1982 because the U.S. halted its spent-fuel reprocessing program thus making breeders pointless); Monju (in Japan, being brought online

again after a serious sodium leak and fire in 1995); and Superphénix (in France, closed in 1998). Therefore, realistically, nuclear power plants constructed in the short and medium term can only be incrementally different from current designs.

In order for the nuclear industry to grow sufficiently so as to replace a significant portion of energy now derived from fossil fuels, scores if not hundreds of new plants would be required, and soon. Given the expense, long lead-time entailed in plant construction, and safety issues, the industry may do well merely to build enough new plants to replace old ones that are nearing their retirement and decommissioning.

Hall *et al.* end their review of nuclear power by stating: "In our opinion we need a very high-level series of analyses to review all of these issues. Even if this is done, it seems extremely likely that very strong opinions, both positive and negative, shall remain. There may be no resolution to the nuclear question that will be politically viable."

6. BIOMASS



ISTOCK PHOTO/SIMONE GOETZ

Consisting of wood and other kinds of plant materials, as well as animal dung, various forms of biomass still account annually for about 13 percent of the world's total energy consumption and are used by up to 3 billion people for cooking and heating.[35] (Note: Most official comparative tallies of energy from various sources, such as those from the IEA and EIA, omit the contribution of "traditional" or noncommercial biomass usage; since these official sources are cited repeatedly herein, the careful reader will find that adding the 13 percent contribution of biomass to the percentage figures for other energy sources yields a total that is greater than 100 percent. The only remedy for this in the present text would have been the re-calculation of statistics from the official sources, but that would merely have added a different potential source of confusion.)

Nontraditional "new" forms of biomass usage generally involve converting wood, crops, manures, or agricultural "waste" products into liquid or gaseous fuel (see ethanol and biodiesel, below), using it to generate electricity, or using it to cogenerate heat and electricity. World electric power generation from biomass was about 183 TWh in 2005 from an installed capacity of 40 GW, with 27 percent of this coming from biogas and municipal solid waste.[36]

Wood fuels presently account for 60 percent of global forest production (most of the remaining 40 percent is used for building materials and paper) and, along with agricultural residues (such as straw), contribute 220 GWh for cooking and heating energy. Forests are a huge renewable resource, covering 7 percent of the Earth's surface, but net deforestation is occurring around the globe, especially in South America, Indonesia, and Africa.[37] Deforestation is caused mostly by commercial logging and clearing of land for large-scale agriculture, *not* by traditional wood gathering, which is often sustainably practiced. However, in many areas wood use and population pressure are leading to deforestation and even desertification.

Cogeneration or Combined Heat and Power (CHP) plants can burn fossil fuels or biomass to make electricity and are configured so that the heat from this process is not wasted but used for space or water heating. Biomass CHP is more efficient at producing heat than electricity, but can be practical on both counts if there is a local source of excess biomass and a community or industrial demand nearby for heat and electricity. Biomass plants are being built in the U.S., in northern Europe, and also in Brazil (where they are associated with the sugar processing industry). The rate of growth of biopower has been around 5 percent per year over the last decade.[38] Biomass power plants are only half as efficient as natural gas plants and are limited in

size by a fuelshed of around 100 miles, but they provide rural jobs and reliable base-load power (though in temperate climates biomass availability is seasonal, and biomass storage is particularly inefficient with high rates of loss).[39]

Biomass conversion technologies (as opposed to direct use via burning) can be divided into three categories. *Biochemical* methods use fermentation and decomposition to create alcohols (primarily ethanol) and landfill gas. Oil extracted from plants, animals or algae can be converted *chemically* into biodiesel. In *thermochemical* processes, biomass is heated (pyrolized) and broken down into carbon and flammable syngases or bio-oil (depending on the speed and temperature of pyrolysis and the feedstock). Bio-oil can be used like fuel oil or refined into biodiesel, while syngas has properties similar to natural gas. There is growing interest in using thermochemical processes to make biofuels, since the leftover carbon (called biochar) can be added to farm fields to improve soil fertility and sequester carbon.[40]

The biochemical process of decay in the absence of oxygen produces biogas, which occurs naturally in places where anaerobic decay is concentrated, like swamps, landfills, or cows' digestive systems. Industrial manufacture of biogas uses bacteria to ferment or anaerobically digest biodegradable material, producing a combustible mixture consisting of 50 to 75 percent methane plus other gases.[41] Biogas can be used like natural gas and burned as fuel in anything from a small cookstove to an electricity plant. Small-scale biogas is utilized all over the world, both in households and for industry.

Biogas can be produced on an industrial scale from waste materials, but it is difficult to find estimates of the possible size of this resource. The National Grid in the U.K. has suggested that waste methane can be collected, cleaned and added to the existing U.K. natural gas pipeline system. That agency estimates that if all the country's sewage, food, agriculture and manufacturing biowastes were used, half of all U.K. residential gas needs could be met. Burning biogas for heat and cooking offers 90 percent energy conversion efficiency, while using biogas to generate electricity is only 30 percent efficient.[42]

PLUS: Biomass is distributed widely where people live. This makes it well suited for use in small-scale, region-appropriate applications where using local biomass is sustainable. In Europe there has been steady growth in biomass CHP plants in which scrap materials from wood processing or agriculture are burned, while in developing countries CHP plants are often run on coconut or rice husks. In California, dairy farms are using methane from cow manure to run their operations. Biogas is used extensively in China for industry, and 25 million households worldwide use biogas for cooking and lighting.[43]

Burning biomass and biogas is considered to be carbon neutral, since unlike fossil fuels these operate within the biospheric carbon cycle. Biomass contains carbon that would ordinarily be released naturally by decomposition or burning to the atmosphere over a short period of time. Using waste sources of biogas like cow manure or landfill gas reduces emissions of methane, a greenhouse gas twenty-three times more potent than carbon dioxide.

MINUS: Biomass is a renewable resource but not a particularly expandable one. Often, available biomass is a waste product of other human activities, such as crop residues from agriculture, wood chips, sawdust and black liquor from wood products industries, and solid waste from municipal trash and sewage. In a less energy-intensive agricultural system, such as may be required globally in the future, crop residues may be needed to replenish soil fertility and will no longer be available for power generation. There may also be more competition for waste products in the future, as manufacturing from recycled materials increases.

Using biomass for cooking food has contributed to deforestation in many parts of the world and it is associated with poor health and shortened lifespans, especially for women who cook with wood or charcoal in unvented spaces. Finding a substitute fuel or increasing the efficiency of cooking with wood is the goal of programs in India, China and Africa.[44] In order to reduce greenhouse gas emissions, it is probably more desirable to re-forest than to use wood as fuel.

EROEI: Energy return estimates for biomass are extremely variable. Biomass is generally more

efficiently used for heat than for electricity, but electricity generation from biomass can be energetically favorable in some instances. Biogas is usually made from waste materials and utilizes decomposition, which is a low energy-input process, so it is inherently efficient. Regarding the EROEI of ethanol and biodiesel, see below.

PROSPECTS: Wood, charcoal, and agricultural residues will almost certainly continue to be used around the world for cooking and heating. There is a declining amount of biomass-derived materials entering the waste stream because of increased recycling, so the prospect of expanding landfill methane capture is declining. Use of other kinds of biogas is a potential growth area. Policies that support biogas expansion exist in India and especially in China, where there is a target of increasing the number of household-scale biogas digesters from an estimated 1 million in 2006 to 45 million by 2020.

7. WIND POWER



TRADITIONAL WINDMILL IN THE NETHERLANDS / DREAMS

One of the fastest-growing energy sources in the world, wind power generation expanded more than five-fold between 2000 and 2007. However, it still accounts for less than 1 percent of the world's electricity generation, and much less than 1 percent of total energy. In the U.S., total production currently amounts to 32Twh, which is 0.77 percent of total electricity supplied, or 0.4 percent of total energy.

Of all new electricity generation capacity installed in the U.S. during 2007 (over 5,200 MW), more than 35 percent came from wind. U.S. wind energy production has doubled in just two years. In September 2008, the U.S. surpassed Germany to become the world leader in wind energy production, with more than 25,000 MW of total generating capacity. [48] (Note: In discussing wind power, it is important to distinguish between nameplate production capacity—the amount of power that theoretically could be generated at full utilization—and the actual power produced: the former number is always much larger, because winds are intermittent and variable.)

Wind turbine technology has advanced in recent years, with the capacity of the largest turbines growing from 1 MW in 1999 to up to 5 MW today. The nations currently leading in installed wind generation capacity are the United States, Germany, Spain, India, and China. Wind power currently accounts for about 19 percent of electricity produced in Denmark, 9 percent in Spain and Portugal, and 6 percent in Germany and the Republic of Ireland. In 2007-2008 wind became the fastest-growing energy source in Europe, in quantitative as well as percentage terms.

PLUS: Wind power is a renewable source of energy, and there is enormous potential for growth in wind generation: it has been estimated that developing 20 percent of the world's wind-rich sites would produce seven times the current world electricity demand. [49] The cost of electricity from wind power, which is relatively low, has been declining further in recent years. In the U.S. as of 2006, the cost per unit of energy production capacity was estimated to be comparable to the cost of new generating capacity for coal and natural gas: wind cost was estimated at $55.80 per MWh, coal at $53.10/MWh, and natural gas at $52.30 (however, once again it is important with wind power to stress the difference between nameplate production capacity and actual energy produced). [47]

MINUS: The uncontrolled, intermittent nature of wind reduces its value when compared to operator-controlled energy sources such as coal, gas, or nuclear power. For example, during January 2009 a high pressure system over Britain resulted in very low wind speeds combined with unusually low temperatures (and therefore higher than normal electricity demand). The only way for utility operators to prepare for such a situation is to build extra

generation capacity from other energy sources. Therefore, adding new wind generating capacity often does not substantially decrease the need for coal, gas, or nuclear power plants; it merely enables those conventional power plants to be used less while the wind is blowing. However, this creates the need for load-balancing grid control systems.

Another major problem for wind generation is that the resource base is often in remote locations. Getting the electricity from the local point-of-generation to a potentially distant load center can be costly. The remoteness of the wind resource base also leads to increased costs for development in the case of land with difficult terrain or that is far from transportation infrastructure.

Being spread out over a significant land area, wind plants must compete with alternative development ideas for these land resources, especially where multiple simultaneous usages are impossible.

The dramatic cost reductions in the manufacture of new wind turbines over the past two decades may slow as efficiencies are maximized and as materials costs increase.

Though wind turbines have been generally accepted by most communities, there has been concern about "visual pollution" and the turbines' danger to birds.

EROEI: The average EROEI from all studies worldwide (operational and conceptual) was 24.6:1. The average EROEI from just the operational studies is 18.1:1. This compares favorably with conventional power generation technologies.[8]

In the U.S., existing wind power has a high EROEI (18:1), though problems with electricity storage may reduce this figure substantially as generating capacity grows. EROEI generally increases with the power rating of the turbine, because *(1)* smaller turbines represent older, less efficient technologies; *(2)* larger turbines have a greater rotor diameter and swept area, which is the most important determinant of a turbine's potential to generate power; and *(3)* since the power available from wind increases by the cube of an increase in the wind speed, and larger turbines can extract energy from winds at greater heights, wind speed and thus EROEI increase quickly with the height of the turbine.

The net energy ratio for wind power can range widely depending on the location of a turbine's manufacture and installation, due to differences in the energy used for transportation of manufactured turbines between countries, the countries' economic and energy structure, and recycling policies. For example, production and operation of an E-40 turbine in coastal Germany requires 1.39 times more energy than in Brazil. The EROEI for sea-based turbines is likely to be lower due to maintenance needs resulting from the corrosive effects of sea spray.

PROSPECTS: Wind is already a competitive source of power. For structural reasons (its long-term cost of production is set by financing terms upon construction and does not vary in the short term), wind benefits from *feed-in tariffs* to protect it from short-term electricity price fluctuations; but overall it will be one of the cheapest sources of power as fossil fuels dwindle—and one with a price guaranteed not to increase over time. In the E.U. its penetration is already reaching 10 to 25 percent in several nations; prospects in the U.S. are in some ways better, as growth is not limited by the geographical constraints and population density found in Europe (with more land covered by cities, that leaves fewer good sites for turbines).

Intermittency can be dealt with to some extent, as the European experience shows, by a combination of smart grid management and infrequent use of the existing fossil-fuel-fired capacity; even though a large amount of thermal power generation capacity will still be required, less coal and gas will need to be burned. Nevertheless, until windmill power can mine ores, produce cement, and make steel and alloys and the machine tools to make components, then wind turbine costs are going to be highly connected to fossil fuel prices, and those costs will impact power prices.

In the U.S., substantial further development of wind power will require significant investment in upgrading the national electricity grid.

8. SOLAR PHOTOVOLTAICS (PV)

Photovoltaic (PV) cells generate electricity directly from sunlight. PV cells usually use silicon as a semiconductor material. Since an enormous amount of

energy is transmitted to the Earth's surface in the form of solar radiation, tapping this source has great potential. If only 0.025 percent of this energy flow could be captured, it would be enough to satisfy world electricity demand.

In 2006 and 2007, photovoltaic systems were the fastest growing energy technology in the world (on a percentage basis), increasing 50 percent annually. At the beginning of 2008, world PV installed capacity stood at 12.4 GW.

The goals of PV research are primarily to *(1)* increase the efficiency of the process of converting sunlight into electricity (the typical efficiency of an installed commercial single-crystalline silicon solar panel is 10 percent, meaning that only 10 percent of the energy of sunlight is converted to electrical energy; while 24.7 percent efficiency has been achieved under laboratory conditions); and *(2)* decrease the cost of production (single-crystalline silicon panels average $3.00 per watt installed, while new photovoltaic materials and technologies, especially thin-film PV materials made by printing or spraying nanochemicals onto an inexpensive plastic substrate, promise to reduce production costs dramatically, though usually at a loss of efficiency or durability).[50]

PLUS: The solar energy captured by photovoltaic technology is renewable—and there is a lot of it. The cumulative average energy irradiating a square meter of Earth's surface for a year is approximately equal to the energy in a barrel of oil; if this sunlight could be captured at 10 percent efficiency, 3,861 square miles of PV arrays would supply the energy of a billion barrels of oil. Covering the world's estimated 360,000 square miles of building rooftops with PV arrays would generate the energy of 98 billion barrels of oil each year.

The price for new installed PV generating capacity has been declining steadily for many years.

Unlike passive solar systems, PV cells can function on cloudy days.[51]

MINUS: The functionality of PV power generation varies not only daily, but also seasonally with cloud cover, sun angle, and number of daylight hours. Thus, as with wind, the uncontrolled, intermittent nature of PV reduces its value as compared to operator-controlled energy sources such as coal, gas, or nuclear power.

Sunlight is abundant, but diffuse; its area density is low. Thus efforts to harvest energy from sunlight are inevitably subject to costs and tradeoffs with scale: for example, large solar installations require suitable land, water for periodic cleaning, roads for access by maintenance vehicles, and so on.

Some of the environmental impacts of manufacturing PV systems have been analyzed by Alsema *et al.* and compared to the impacts of other energy technologies.[52] This study found PV system CO_2 emissions to be greater than those for wind systems, but only 5 percent of those from coal burning. A potential impact would be the loss of large areas of wildlife habitat if really large industrial-scale solar arrays were built in undeveloped desert areas.

EROEI: Explicit net energy analysis of PV energy is scarce. However, using "energy pay-back time" and the lifetime of the system, it is possible to determine a rough EROEI. From a typical life-cycle analysis performed in 2005, Hall *et al.* calculated an EROEI of 3.75:1 to 10:1.[53]

Some of these EROEI values are likely to change as research and development continue. If present conditions persist, EROEI may decline since sources of silicon for the industry are limited by the production capacity of semiconductor manufacturers.

PROSPECTS: Despite the enormous growth of PV energy in recent years, the incremental increase in oil, gas, or coal production during a typical recent year has exceeded all existing photovoltaic energy production. Therefore if PV is to become a primary energy source, the rate of increase in capacity will need to be even greater than is currently the case.

Because of its high up-front cost, a substantial proportion of installed PV has been distributed on home roofs and in remote off-grid villages, where provision of conventional electricity sources would be impractical or prohibitively expensive. Commercial utility-scale PV installations are now appearing in several nations, partly due to the lower price of newer thin-film PV materials and changing government policies.[54]

The current economic crisis has lowered the rate of PV expansion substantially, but that situation could be reversed if government efforts to revive the economy focus on investment in renewable energy.

However, if very large and rapid growth in the PV industry were to occur, the problem of materials shortages would have to be addressed in order to avert dramatic increases in cost. Materials in question—copper, cadmium-telluride (CdTe), and copper-indium-gallium-diselenide (CIGS)—are crucial to some of the thin-film PV materials to which the future growth of the industry (based on lowering of production costs) is often linked. With time, PV production may be constrained by lack of available materials, the rate at which materials can be recovered or recycled, or possibly by competition with other industries for those scarce materials. A long-term solution will hinge on the development of new PV materials that are common and cheap.

Concentrating PV, which uses lenses to focus sunlight onto small, highly efficient silicon wafers, is achieving ever-lower costs and ever-higher efficiencies, and could be competitive with coal, nuclear, and natural gas power generation on an installed per-watt capacity basis within just a few years. Nevertheless, this technology is still in its infancy and even if it can be developed further the problem of intermittency will remain.

9. ACTIVE (CONCENTRATING) SOLAR THERMAL

This technology typically consists of installations of mirrors to focus sunlight, creating very high temperatures that heat a liquid which turns a turbine, producing electricity. The same power plant technology that is used with fossil fuels can be used with solar thermal since the focusing collectors can heat liquid to temperatures from 300°C to 1000°C. Fossil fuel can be used as a backup at night or when sunshine is intermittent.

There is a great deal of interest and research in active solar thermal and a second generation of plants is now being designed and built, mostly in Spain. Worldwide capacity will soon reach 3 GW.

PLUS: Like PV, active solar thermal makes use of a renewable source of energy (sunlight), and there is enormous potential for growth. In the best locations, cost per watt of installed capacity is competitive with fossil-fuel power sources. Solar thermal benefits from using already mature power plant



technology and needs less land than a photovoltaic array of the same generating capacity.

MINUS: Again like PV, concentrating solar thermal power is intermittent and seasonal. Some environmental impacts are to be expected on the land area covered by mirror arrays and during the construction of transmission lines to mostly desert areas where this technology works best.

EROEI: The energy balance of this technology is highly variable depending on location, thus few studies have been done. In the best locations (areas with many sunny days per year), EROEI is likely to be relatively high.

PROSPECTS: There is considerable potential for utility-scale deployment of concentrating solar thermal power. Some analysts have even suggested that all of the world's energy needs could be filled with electrical power generated by this technology. This would require covering large areas of desert in the southwestern U.S., northern Africa, central Asia, and central Australia with mirrors, as well as constructing high-power transmission lines from these remote sites to places where electricity demand is highest. Such a project is possible in principle, but the logistical hurdles and financial costs would be daunting. Moreover, some intermittency problems would remain even if the sunniest sites were chosen.

Leaving aside such grandiose plans, for nations that lie sufficiently close to the equator this appears to be one of the most promising alternative sources of energy available.[21]

Recently a startup project called Desertec has proposed raising an estimated $570 billion for the

construction of an enormous active solar thermal installation in the Sahara Desert to supply 15 percent of Europe's electricity needs. Concentrating solar thermal plants in Spain are now testing a heat storage module,[25] which can maintain power delivery during nights and perhaps longer periods of low sunshine. Since thermal energy is much cheaper to store than electricity, this could represent an advantage over wind or PV power if the Spanish tests are successful.

10. PASSIVE SOLAR



This simple approach consists of capturing and optimizing natural heat and light from the sun within living spaces without the use of collectors, pumps, or mechanical parts, thus reducing or eliminating the need for powered heating or lighting. Buildings are responsible for a large percentage of total energy usage in most countries, and so passive solar technologies are capable of offsetting a substantial portion of energy production and consumption that might otherwise come from fossil fuels. A passive solar building is designed *(1)* to maintain a comfortable average temperature, and *(2)* to minimize temperature fluctuations. Such a building usually takes more time, money, and design effort to construct, with extra costs made up in energy savings over time.

Passive solar heating takes three dominant forms: glazing surfaces to help capture sunlight; *trombe walls*, and other features for heat storage; and insulation to maintain relatively constant temperatures. Other important factors include orienting the long side of the building toward the sun, determining the appropriate sizing of the mass required to retain and slowly release accumulated heat after the sun sets, and determining the size of the trombe wall necessary to heat a given space. (Of course, the size of the entire building is also an issue—a passive solar design for a monster home makes no sense.)

Other passive uses of sunlight in buildings include passive solar cooling and daylighting (using windows and openings to make use of natural light).

PLUS: Depending on the study, passive solar homes cost less than, the same as, or up to 5 percent more than other custom homes; however, even in the latter case the extra cost will eventually pay for itself in energy savings. A passive solar home can only provide heat for its occupants, not extra electricity, but if used on all new houses passive systems could go a long way toward replacing other fuels.

Incorporating a passive solar system into the design of a new home is generally cheaper than fitting it onto an existing home. A solar home "decreases cooling loads and reduces electricity consumption, which leads to significant decline in the use of fossil fuels."[26] Passive solar buildings, in contrast to buildings with artificial lighting, may also provide a healthier, more productive work environment.

MINUS: Limitations to passive solar heating can include inappropriate geographic location (clouds and colder climates make solar heating less effective), and the relative difficulties of sealing the house envelope to reduce air leaks while not increasing the chance of pollutants becoming trapped inside. The heat-collecting, equator-facing side of the house needs good solar exposure in the winter, which may require spacing houses further apart and using more land than would otherwise be the case.

EROEI: Strictly speaking, it is not appropriate to use EROEI calculations in this instance since there is no "energy out" for the equation. Passive solar design is essentially a matter of using the "free energy" of nature to replace other forms of energy that would otherwise need to be used for heating and lighting. It is extremely site-specific, and architects rarely obtain quantitative feedback on systems they have designed, so determining general figures

for savings is difficult (but a range from 30 to 70 percent is typical). If the system is built into the house from the beginning, then energy savings can be obtained with few or no further investments.

PROSPECTS: Designing buildings from the start to take advantage of natural heating and lighting, and to use more insulation and solar mass, has tremendous potential to reduce energy demand. However, in many cases high-efficiency buildings require more energy for construction, (construction energy is not generally considered in savings calculations, which are typically done only on operational energy).

Until now, higher up-front construction costs have discouraged mass-scale deployment of passive solar homes in most countries. Higher energy prices will no doubt gradually alter this situation, but quicker results could be obtained through shifts in building regulations and standards, as has been shown in Germany. There, the development of the voluntary Passivhaus standard has stimulated construction and retrofitting of more than 20,000 passive houses in northern Europe.[57] The Passivhaus is designed to use very little energy for heating. Passive solar provides space heating, and superinsulation and controlled outdoor air exchange (usually with heat exchanger) reduces heat loss.

Buildings in industrialized nations have generally become more efficient in recent years; however declines in averaged energy use per square foot have generally been more than offset by population growth and the overbuilding of real estate (the average size of buildings has grown), so that the total amount of energy used in buildings has continued to increase. Thus, population and economic growth patterns need to be part of the "green building" agenda, along with the increasing use of passive solar design elements.[58]

11. GEOTHERMAL ENERGY

Derived from the heat within the Earth, geothermal energy can be "mined" by extracting hot water or steam, either to run a turbine for electricity generation or for direct use of the heat. High-quality geothermal energy is typically available only in regions where tectonic plates meet and volcanic



GEOTHERMAL RIBBECKITE GEYSER, LITTLE GEYSER

and seismic activity are common. Low-temperature geothermal direct heat can be tapped anywhere on Earth by digging a few meters down and installing a tube system connected to a heat pump.

Currently, the only places being exploited for geothermal electrical power are where hydrothermal resources exist in the form of hot water or steam reservoirs. In these locations, hot groundwater is pumped to the surface from two to three km deep wells and used to drive turbines. One example: The Geysers installation in Northern California, occupying 30 square miles along the Sonoma and Lake County border, comprises the world's largest complex of geothermal power plants. The fifteen power plants there have a total net generating capacity of about 725 MW of electricity—enough to power 725,000 homes, or a city the size of San Francisco. The Geysers meets the typical power needs of Sonoma, Lake, and Mendocino counties, as well as a portion of the power needs of Marin and Napa counties.

Power can also be generated from hot dry rocks by pumping turbine fluid (essentially water) into them through three to ten km deep boreholes. This method, called Enhanced Geothermal System (EGS) generation, is the subject of a great deal of research, but no power has been generated commercially using EGS. If perfected, EGS could enable geothermal power to be harvested in far more places than is currently practical.

In 2006, world geothermal power capacity was about 10 GW.[59] Annual growth of geothermal power capacity worldwide has slowed from 9 percent in 1997 to 2.5 percent in 2004.

However, the use of direct heat using heat pumps or piped hot water has been growing 30 to 40 percent annually, particularly in Europe, Asia, and Canada.[59] (This is a fundamentally different technology from geothermal electricity production, even though the basic resource—heat from the Earth—is the same.)

PLUS: Geothermal power plants produce much lower levels of carbon emissions and use less land area as compared to fossil fuel plants. They can also run constantly, unlike some other renewable energy systems, such as wind and solar.

Geothermal direct heat is available everywhere (and geothermal heat pumps are among the few non-fossil fuel options for space heating), although it is less cost-effective in temperate climates. Countries rich in geothermal resources (such as Sudan, Ethiopia, Colombia, Ecuador, much of the Caribbean, and many Pacific islands) could become less dependent on foreign energy.

MINUS: In addition to geography and technology, high capital cost and low fossil fuel prices are major limiting factors for the development of geothermal electricity production. Technological improvements (especially the further development of EGS) are necessary for the industry to continue to grow. Water can also be a limiting factor, since both hydrothermal and dry rock systems consume water.

The sustainability of geothermal power generating systems is a cause of concern. Geothermal resources are only renewable if heat removal is balanced by natural replenishment of the heat source. Some geothermal plants have seen declines in temperature, most probably because the plant was oversized for the local heat source.

There is likely to be some air, water, thermal, and noise pollution from the building and operation of a geothermal plant, as well as solid waste buildup and the possibility of induced seismic activity near it.

EROEI: The calculated net energy for hydrothermal power generation has ranged, depending on the researcher, from 2:1 to 13:1. This discrepancy reflects differences in efficiency due to site characteristics and the lack of a unified methodology for EROEI analysis, as well as disagreements about system boundaries, quality-correction, and future expectations.[60]

There are no calculations of EROEI values for geothermal direct heat use, though for various reasons it can be assumed that they are higher than those for hydrothermal electrical power generation. As a starting point, it has been calculated that heat pumps move three to five times the energy in heat that they consume in electricity.

PROSPECTS: There is no consensus on potential resource base estimates for geothermal power generation. Hydrothermal areas that have both heat and water are rare, so the large-scale expansion of geothermal power depends on whether EGS and other developing technologies will prove to be commercially viable. A 2006 MIT report estimated U.S. hydrothermal resources at 2,400 to 9,600 EJ, while dry-heat geothermal resources were estimated to be as much as 13 million EJ.[61]

Until EGS is developed and deployed, limited hydrothermal resources will continue to be important regionally.

Meanwhile, direct geothermal heat use via heat pumps provides one of the few available alternatives to the use of fossil fuels or wood for space heating, and is therefore likely to see an increased rate of deployment in colder climates.

12. ENERGY FROM WASTE



Trash can be burned to yield energy, and methane can be captured from landfills. All told, the world derives over 100 TWh of electricity, and an even greater amount of useful heat energy, from waste,

amounting to about 1 percent of all energy used globally.

In the U.S., 87 trash incinerating generation plants produce about 12.3 TWh of electricity per year. Municipal waste is also burned for power in Europe; Taiwan, Singapore, and Japan incinerate 50 to 80 percent of their waste. There are 600 incineration plants producing energy worldwide. However, the practice is mostly restricted to high-income countries because such plants are expensive to operate and the waste stream in low-income nations typically has low calorific value. One estimate for total energy produced is 430 TWh, but this includes heat energy as well as electricity.[53]

The capture of landfill gas yields 11 TWh of electricity and 77 billion cubic feet of gas for direct use annually in the U.S. (from 340 out of a total of 2,975 landfills).[54] In Europe, landfill gas provides 17 TWh of electricity as well as heat energy, for a total of 36.3 TWh of biogas energy; there, recovery of biogas is now mandatory.

PLUS: Industrial waste products contain embodied energy; thus efforts to recover that energy can be thought of as a way of bringing greater efficiency to the overall industrial system. Energy production from waste does not entail the extraction of more natural resources than have already been used in the upstream activities that generated the waste (other than the resources used to build and operate the waste-to-energy plants themselves).

MINUS: Waste incineration releases into the environment whatever toxic elements are embodied in the waste products that are being burned—including dioxin, one of the most deadly compounds known. Moreover, incinerators emit more CO_2 per unit of energy produced than coal-fired, natural-gas-fired, or oil-fired power plants.

If energy efficiency is the goal, a better systemic solution to dealing with wastes would be to minimize the waste stream. Moreover, a zero-waste approach is one of the fastest, cheapest, and most effective strategies to protect the climate and the environment: significantly decreasing waste disposed in landfills and incinerators could reduce greenhouse gases by an amount equivalent to the closing of one-fifth of U.S. coal-fired power plants. However, if economic activity continues to decline, as a result of slower economic growth, less waste will be produced, one of the up-sides of financial decline.

EROEI: Little information is available on the net energy from waste incineration or landfill gas capture. If system boundaries are narrowly drawn (so that only direct energy costs are included), the EROEI from landfill gas capture is likely to be high. EROEI from trash incineration is likely to decline as more investment is directed toward preventing toxic materials from being released from burners.

PROSPECTS: If and when zero-waste policies are more generally adopted, the amount of waste available to be burned or placed into landfills will decline dramatically. Therefore waste-to-energy projects should not be regarded as sustainable over the long term, nor should this energy source be regarded as being scalable—that is, it is unlikely to be dramatically increased in overall volume.

13. ETHANOL

Ethanol is an alcohol made from plant material—usually sugar cane or corn—that is first broken down into sugars and then fermented. It has had a long history of use as a transportation fuel beginning with the Model T Ford. In 2007, 13.1 billion gallons of ethanol were produced globally. Thirty-eight percent of this was produced from sugar cane in Brazil, while another 50 percent was manufactured from corn in the U.S.[55] There has been a high rate of growth in the industry, with a 15 percent annual increase in world production between 2000 and 2006. Ethanol can be substituted for gasoline, but the total quantity produced is still only a small fraction of the 142 trillion gallons of gasoline consumed in the U.S. each year.[56]

Ethanol can be blended with gasoline and used in existing cars in concentrations of up to 10 percent. For percentages higher than this, engine modifications are needed since ethanol is more corrosive than gasoline. New cars are already being manufactured that run on 100 percent ethanol, on the 25/75 ethanol/gasoline "gasohol" blend used in Brazil, or the 85/15 ("E85") blend found in the United States.

Corn ethanol has become highly controversial because of problems associated with using a staple food plant such as corn as a fuel, and the resulting



ETHANOL PLANT, SOUTH DAKOTA

diversion of huge amounts of land from food production to fuel production. Another problem is that ethanol plants are themselves usually powered by fossil fuels.[67] However, there is now growing interest in making ethanol from non-food plant materials like corn stover, wheat chaff, or pine trees. One potential feedstock is the native prairie plant switchgrass, which requires less fossil fuel input for cultivation than corn. However, making cellulosic ethanol out of these non-food feedstocks is a technology in its infancy and not yet commercialized.

Potential ethanol resources are limited by the amount of land available to grow feedstock. According to the Union of Concerned Scientists (UCS), using all of the corn grown in the U.S. with nothing left for food or animal feed would only displace about 15 percent of U.S. gasoline demand by 2025.[68] Large-scale growing of switchgrass or other new cellulose crops would require finding very large acreages on which to cultivate them, also aggravating shortages of agricultural lands.

PLUS: Ethanol has the portability and flexibility of oil and can be used in small amounts blended with gasoline in existing vehicles. The distribution infrastructure for gasoline could be gradually switched over to ethanol as new cars that run on higher ethanol concentrations are phased in, though current pipelines would eventually have to be replaced as ethanol is highly corrosive.

Cellulosic ethanol is widely considered to be a promising energy source since it has potentially less environmental impact with respect to land use and lifecycle greenhouse gas emissions than fossil fuels. The UCS reports that it has the potential to reduce greenhouse gas emissions by 80 to 90 percent compared to gasoline.[69] However, this conclusion is disputed, and there are still serious technical problems with producing cellulosic ethanol on a commercial scale.

MINUS: There are approximately 45 MJ per kilogram contained in both finished gasoline and crude oil, while ethanol has an energy density of about 26 MJ per kilogram and corn has only 16 MJ per kilogram. In general, this means that large amounts of corn must be grown and harvested to equal even a small portion of existing gasoline consumption on an energy-equivalent level, which will undoubtedly expand the land area that is impacted by the production process of corn-based ethanol.

Increases in corn ethanol production may have helped to drive up the price of corn around the world in 2007, contributing to a 400 percent rise in the price of tortillas in Mexico.[70] Ethanol and other biofuels now consume 17 percent of the world's grain harvest.

There are climate implications to corn ethanol production as well. If food crops are used for making transportation fuel rather than food, more land will have to go into food production somewhere else. When natural ecosystems are cleared for food or ethanol production, the result is a "carbon debt" that releases 17 to 420 times more CO_2 than is saved by the displacement of fossil fuels.[71] The situation is better when dealing with existing cropland, but not much: Since fossil fuels are necessary for growing corn and converting it into ethanol, the finished fuel is estimated to offer only a 10 to 25 percent reduction in greenhouse gas emissions as compared to gasoline,[72] though even this level of reduction is questionable, as it relies on calculations involving DDGS; considering only liquid fuels, there is likely less or no greenhouse gas reduction. Corn ethanol also uses three to six gallons of water for every gallon of ethanol produced and has been shown to emit more air pollutants than gasoline.

EROEI: There is a range of estimates for the net energy of ethanol production since EROEI depends on widely ranging variables such as the energy input required to get the feedstock (which is high for corn and lower for switchgrass and cellulose waste materials) and the nature of the process used to convert it to alcohol.

There is even a geographic difference in energy input depending on how well suited the feedstock crop is to the region in which it is grown. For example, there is a definite hierarchy of corn productivity by state within the U.S.: in 2005, 173 bushels per acre (10,859 kg/ha) were harvested in Iowa, while only 113 bushels per acre were harvested in Texas (7,093 kg/ha). This is consistent with the general principle of "gradient analysis" in ecology, which holds that individual plant species grow best near the middle of their gradient space; that is near the center of their range in environmental conditions such as temperature and soil moisture. The climatic conditions in Iowa are clearly at the center of corn's gradient space. Statistics suggest that corn production is also less energy-intensive at or near the center of corn's gradient space.[8] This would imply a diminishing EROEI for ethanol production as the distance from Iowa increases, meaning that the geographic expansion of corn production will produce lower yields at higher costs. Indeed, ethanol production in Iowa and Texas yield very different energy balances, so that in Iowa the production of a bushel of corn costs 43 MJ, while in Texas it costs 71 MJ.

Calculated net energy figures for corn ethanol production in the U.S. range from less than 1:1 to 1.8:1.[9]

Ethanol from sugar cane in Brazil is calculated to have an EROEI of 8:1 to 10:1, but when made from Louisiana sugar cane in the U.S., where growing conditions are worse, the EROEI is closer to 1:1.[10] Estimates for the projected net energy of cellulose ethanol vary widely, from 2:1 to 36:1.[11] However, such projections must be viewed skeptically, given the absence of working production facilities.

These EROEI figures differ largely because of co-product crediting (i.e., adding an energy return figure to represent the energy replacement value of usable by-products of ethanol production—principally DDGS). In the USDA's figures for energy use in ethanol production, EROEI is 1.04 prior to the credits. But some analysts argue that co-product crediting is immaterial to the amount of energy required to produce ethanol. Distillation is highly energy intensive, and even more so in the case of cellulosic ethanol because the initial beer concentration is so low (about 4 percent compared to 10 to 12 percent for corn). This dramatically increases the amount of energy needed to boil off the remaining water. At absolute minimum, 15,000 BTU of energy are required in distillation alone per gallon of ethanol produced (current corn ethanol plants use about 40,000 BTU per gallon). This sets the limit on EROEI. If distillation were the only energy input in the process, and it could be accomplished at the thermodynamic minimum, then EROEI would be about 5:1. But there are other energy inputs to the process and distillation is not at the thermodynamic minimum.

Sugar cane EROEI estimates and cellulosic estimates that are frequently cited exclude non-fossil fuel energy inputs. For example, 8 to 10:1 EROEI numbers for the production of ethanol from sugar cane in Brazil exclude all bagasse (dry, fibrous residue remaining after the extraction of juice from the crushed stalks of sugar cane) burned in the refinery—which is clearly an energy input, though one that is derived from the sugar cane itself. Cellulosic ethanol EROEI estimates often assume that the lignin recovered from biomass is sufficient not only to fuel the entire plant, but to export 1 to 2 MJ of electricity per liter of ethanol produced (which is then credited back to the ethanol). However, this assumption is based on a single lab study that has not been replicated. The questions of whether these non-fossil energy inputs should be included or excluded in net energy calculations, and how such inputs should be measured and evaluated, are contested.

PROSPECTS: Ethanol's future as a major transport fuel is probably dim except perhaps in Brazil, where sugar cane supplies the world's only economically competitive ethanol industry. The political power of the corn lobby in the United States has kept corn ethanol subsidized and has kept investment flowing, but the fuel's poor net energy performance will eventually prove it to be uneconomic. The technical problems of processing cellulose for ethanol may eventually be overcome, but land use considerations and low EROEI will likely limit the scale of production.

14. BIODIESEL



BIODIESEL BUS, BARCELONA

This is a non-petroleum-based diesel fuel made by *transesterification* of vegetable oil or animal fat (tallow)—a chemical treatment to remove glycerine, leaving long-chain alkyl (methyl, propyl, or ethyl) esters. Biodiesel can be used in unmodified diesel engines either alone, or blended with conventional petroleum diesel. Biodiesel is distinguished from straight vegetable oil (SVO), sometimes referred to as "waste vegetable oil" (WVO), "used vegetable oil" (UVO), or "pure plant oil" (PPO). Vegetable oil can itself be used as a fuel either alone in diesel engines with converted fuel systems, or blended with biodiesel or other fuels.

Vegetable oils used as motor fuel or in the manufacture of biodiesel are typically made from soy, rape seed ("canola"), palm, or sunflower. Considerable research has been devoted to producing oil for this purpose from algae, with varying reports of success (more on that below).

Global biodiesel production reached about 8.2 million tons (230 million gallons) in 2006, with approximately 85 percent of production coming from the European Union, but with rapid expansion occurring in Malaysia and Indonesia.[77]

In the United States, average retail (at the pump) prices, including Federal and state fuel taxes, of B2/B5 are lower than petroleum diesel by about 12 cents, and B20 blends are the same as petrodiesel. B99 and B100 generally cost more than petrodiesel except where local governments provide a subsidy. (The number following "B" in "B20," "B99," etc., refers to the percentage of biodiesel in the formulation of the fuel; in most instances, the remaining percentage consists of petroleum diesel. Thus "B20" fuel consists of 20 percent biodiesel and 80 percent petroleum diesel.)

PLUS: Biodiesel's environmental characteristics are generally more favorable than those of petroleum diesel. Through its lifecycle, biodiesel emits one fifth the CO_2 of petroleum diesel, and contains less sulfur. Some reports suggest that its use leads to longer engine life, which presumably would reduce the need for manufacturing replacement engines.[78] When biodiesel is made from waste materials like used vegetable oil, the net environmental benefits are more pronounced.

MINUS: The principal negative impact of expanding biodiesel production is the need for large amounts of land to grow oil crops. Palm oil is the most fruitful oil crop, producing 13 times the amount of oil as soybeans, the most-used biodiesel feedstock in the United States. In Malaysia and Indonesia, rainforest is being cut to plant palm oil plantations, and it has been estimated that it will take 100 years for the climate benefits of biodiesel production from each acre of land to make up for the CO_2 emissions from losing the rainforest.[79] Palm oil production for food as well as fuel is driving deforestation across Southeast Asia and reducing rainforest habitat to the point where larger animal species, such as the orangutan, are threatened with extinction.[80] Soybean farming in Brazil is already putting pressure on Amazonian rainforests. If soybeans begin to be used extensively for biofuels this pressure will increase.

EROEI: The first comprehensive comparative analysis of the full life cycles of soybean biodiesel and corn grain ethanol has concluded that biodiesel has much less of an impact on the environment and a much higher net energy benefit than corn ethanol, but that neither can do much to meet U.S. energy demand.[81] Researchers tracked all the energy used for growing corn and soybeans and converting the crops into biofuels. They also examined how much fertilizer and pesticide corn and soybeans required and the quantities of greenhouse gases, nitrogen oxides, phosphorus, and pesticide pollutants each released into the environment. The study showed a positive energy balance for both fuels; however,

the energy returns differed greatly: soybean biodiesel currently returns 93 percent more energy than is used to produce it (1.93:1), while corn grain ethanol provides, according to this study, only 25 percent more energy (1.25:1). When discussing such distinctions, it is important to recall that industrial societies emerged in the context of energy returns in the double digits—50:1 or more, meaning fifty times as much energy yielded as invested.

Other researchers have claimed that the net energy of soybean biodiesel has improved over the last decade because of increased efficiencies in farming, with one study calculating an EROEI of 3.5:1.[52] Palm oil biodiesel has the highest net energy, calculated by one study at 9:1.[53]

PROSPECTS: There are concerns, as with ethanol, that biodiesel crops will increasingly compete with food crops for land in developing countries and raise the price of food. The need for land is the main limitation on expansion of biodiesel production and is likely to restrict the potential scale of the industry.[54] Water is also a limiting factor, given that world water supplies for agricultural irrigation are already problematic.

Biodiesel can also be made from algae, which in turn can be grown on waste carbon sources, like the CO_2 scrubbed from coal-burning power plants or sewage sludge. Saltwater rather than freshwater can be used to grow the algae, and there is optimism that this technology can be used to produce significant amounts of fuel. However, the process is still in a developmental stage. Limiting factors may be the need for large closed bioreactors, water supply, sunshine consistency, and thermal protection in cold climates.[55]

Biodiesel from waste oil and fats will continue to be a small and local source of fuel, while algae-growing shows promise as a large-scale biodiesel technology only if infrastructure and maintenance costs can be minimized.

15. TAR SANDS

Sometimes called "oil sands," this controversial fossil fuel consists of bitumen (flammable mixtures of hydrocarbons and other substances that are components of asphalt and tar) embedded in sand or clay.



The resource is essentially petroleum that formed without a geological "cap" of impervious rock (such as shale, salt, or anhydrite) being present to prevent lighter hydrocarbon molecules from rising to the surface, and that therefore volatized rather than remaining trapped underground.

Tar sands can be extracted through an *in situ* underground liquefaction process by the injection of steam, or by mining with giant mechanized shovels. In either case, the material remains fairly useless in its raw state, and requires substantial processing or upgrading, the finished product being referred to as "syncrude."

The sites of greatest commercial concentration of the resource are in Alberta, Canada and the Orinoco Basin of Venezuela (where the resource is referred to as heavy oil). Current production of syncrude from operations in Canada amounts to about 1.5 million barrels per day, which accounts for 1.7 percent of total world liquid fuels production, or a little less than 0.7 percent of total world energy. Reserves estimates range widely, from less than 200 billion barrels of oil equivalent up to 1.7 trillion barrels in Canada; for Venezuela the most-cited reserves estimate of extra heavy crude is 235 billion barrels, though in both cases it is likely that a large portion of what has been classified as "reserves" should be considered unrecoverable "resources" given the likelihood that deeper and lower-quality tar sands will require more energy for their extraction and processing than they will yield.

PLUS: The only advantages of tar sands over conventional petroleum are that *(1)* large amounts remain to be extracted, and *(2)* the place where the

resource exists in greatest quantity (Canada) is geographically close and politically friendly to the country that imports the most oil (the U.S.).

MINUS: Tar sands have all of the negative qualities associated with the other fossil fuels (they are nonrenewable, polluting, and climate-changing), but in even greater measure than is the case with natural gas or conventional petroleum. Tar sands production is the fastest-growing source of Canada's greenhouse gas emissions, with the production and use of a barrel of syncrude ultimately doubling the amount of CO_2 that would be emitted by the production and use of a barrel of conventional petroleum. Extraction of tar sands has already caused extensive environmental damage across a broad expanse of northern Alberta.

All of the techniques used to upgrade tar sands into syncrude require other resources. Some of the technologies require significant amounts of water and natural gas—as much as 4.5 barrels of water and 1200 cubic feet (34 cubic meters) of natural gas for each barrel of syncrude.

As a result, syncrude is costly to produce. A fixed per-barrel dollar cost is relatively meaningless given recent volatility in input costs; however, it is certainly true that production costs for syncrude are much higher than historic production costs for crude oil, and compare favorably only with the higher costs for the production of a new marginal barrel of crude using expensive new technologies.

EROEI: For tar sands and syncrude production, net energy is difficult to assess directly. Various past net energy analyses for tar sands range from 1.5:1 to 7:1, with the most robust and recent of analyses suggesting a range of 5.2:1 to 5.8:1.[80] This is a small fraction of the net energy historically derived from conventional petroleum.

PROSPECTS: The International Energy Agency expects syncrude production in Canada to expand to 5 mb/d by 2030, but there are good reasons for questioning this forecast. The environmental costs of expanding production to this extent may be unbearable. Further, investment in tar sands expansion is now declining, with more than US$60 billion worth of projects having been delayed in the last three months of 2008 as the world skidded into recession. A more realistic prospect for tar sands production may be a relatively constant production rate, rising perhaps only to 2 or 3 million barrels per day.

16. OIL SHALE

If tar sands are oil that was "spoiled" (in that the shorter-chained hydrocarbon molecules have volatized, leaving only hard-to-use bitumen), oil shale (or kerogen, as it is more properly termed) is oil that was undercooked: it consists of source material that was not buried at sufficient depth or for long enough to be chemically transformed into the shorter hydrocarbon chains found in crude oil or natural gas.

Deposits of potentially commercially extractable oil shale exist in thirty-three countries, with the largest being found in the western region of the U.S. (Colorado, Utah, and Wyoming). Oil shale is used to make liquid fuel in Estonia, Brazil, and China; it is used for power generation in Estonia, China, Israel, and Germany; for cement production in Estonia, Germany, and China; and for chemicals production in China, Estonia, and Russia. As of 2005, Estonia accounted for about 70 percent of the world's oil shale extraction and use. The percentage of world energy currently derived from oil shale is negligible, but world resources are estimated as being equivalent to 2.8 trillion barrels of liquid fuel.[81]

PLUS: As with tar sands, the only real upside to oil shale is that there is a large quantity of the resource in place. In the U.S. alone, shale oil resources are estimated at 2 trillion barrels of oil equivalent, nearly twice the amount of the world's remaining conventional petroleum reserves.

MINUS: Oil shale suffers from low energy density, about one-sixth that of coal. The environmental impacts from its extraction and burning are very high, and include severe air and water pollution and the release of half again as much CO_2 as the burning of conventional oil. The use of oil shale for heat is far more polluting than natural gas or even coal. Extraction on a large scale in the western U.S. would require the use of enormous amounts of water in an arid region.

EROEI: Reported EROEI for oil produced from oil shale is generally in the range of 1.5:1 to 4:1[82]. Net energy for this process is likely to be

lower than the production of oil from tar sands because of the nature of the material itself.

PROSPECTS: During the past decades most commercial efforts to produce liquid fuels from oil shale have ended in failure. Production of oil shale worldwide has actually declined significantly since 1980. While low-level production is likely to continue in several countries that have no other domestic fossil fuel resources, the large-scale development of production from oil shale deposits seems unlikely anywhere for both environmental and economic reasons.

17. TIDAL POWER



TIDAL POWER PLANT, RANCE RIVER, FRANCE

Generation of electricity from tidal action is geographically limited to places where there is a large movement of water as the tide flows in and out, such as estuaries, bays, headlands, or channels connecting two bodies of water.

The oldest tidal power technology dates back to the Middle Ages, when it was used to grind grain. Current designs consist of building a barrage or dam that blocks off all or most of a tidal passage; the difference in the height of water on the two sides of the barrage is used to run turbines. A newer technology, still in the development stage, places underwater turbines called tidal stream generators directly in the tidal current or stream.

Globally, there is about 0.3 GW of installed capacity of tidal power[85], most of it produced by the barrage built in 1966 in France across the estuary of the Rance River (barrages are essentially dams across the full width of a tidal estuary).

PLUS: Once a tidal generating system is in place, it has low operating costs and produces reliable, although not constant, carbon-free power.

MINUS: Sites for large barrages are limited to a few places around the world. Tidal generators require large amounts of capital to build, and can have a significant negative impact on the ecosystem of the dammed river or bay.

EROEI: No calculations have been done for tidal power EROEI as yet. For tidal stream generators this figure might be expected to be close to that of wind power (an average EROEI of 18:1) since the turbine technologies for wind and water are so similar that tidal stream generators have been described as "underwater windmills." However, tidal EROEI figures would likely be lower due to the corrosiveness of seawater and thus higher construction and maintenance energy use. The EROEI of barrage systems might be somewhat comparable to that of hydroelectric dams (EROEI in the range of 11.2:1 to 267:1), but will likely be lower since the former only generate power for part of the tidal cycle.

PROSPECTS: One estimate of the size of the global annual potential for tidal power is 450 TWh, much of it located on the coasts of Asia, North America, and the United Kingdom.[86] Many new barrage systems have been proposed and new sites identified, but the initial cost is a difficulty. There is often strong local opposition, as with the barrage proposed for the mouth of the River Severn in the U.K. Tidal stream generators need less capital investment and, if designed and sited well, may have very little environmental impact. Prototype turbines and commercial tidal stream generating systems are being tested around the world.

18. WAVE ENERGY

Designed to work offshore in deeper water, wave energy harvests the up-and-down, wind-driven motion of the waves. Onshore systems use the force of breaking waves or the rise and fall of water to run pumps or turbines.

The commonly quoted estimate for potential global wave power generation is about 2 TW[87], distributed mostly on the western coasts of the Americas, Europe, southern Africa, and Australia,



PELAMIS WAVE ENERGY CONVERTER
EUROPEAN MARINE ENERGY TEST CENTRE

where wind-driven waves reach the shore after accumulating energy over long distances. For current designs of wave generators the economically exploitable resource is likely to be from 140 to 750 TWh per year.[32] The only operating commercial system has been the 2.25 MW Aguadora Wave Park off the coast of Portugal. (However, this was recently pulled ashore, and it is not clear when it will be redeployed).

Research into wave energy has been funded by both governments and small engineering companies, and there are many prototype designs. Once the development stage is over and the price and siting problems of wave energy systems are better understood, there may be more investment in them. In order for costs to decrease, problems of corrosion and storm damage must be solved.

PLUS: Once installed, wave energy devices emit negligible greenhouse gases and should be cheap to run. Since the majority of the world's population lives near coastlines, wave energy is convenient for providing electricity to many. It may also turn out to provide an expensive but sustainable way to desalinate water.

MINUS: In addition to high construction costs, there are concerns about the environmental impact of some designs, as they may interfere with fishing grounds. Interference with navigation and coastal erosion are also potential problems. Wave energy fluctuates seasonally as well as daily, since winds are stronger in the winter, making this a somewhat intermittent energy source.

EROEI: The net energy of wave energy devices has not been thoroughly analyzed. One rough estimate of EROEI for the Portuguese Pelamis device is 15:1.[33]

PROSPECTS: Wave power generation will need more research, development, and infrastructure build-out before it can be fairly assessed. More needs to be understood about the environmental impacts of wave energy "farms" (collections of many wave energy machines) so that destructive siting can be avoided. The best devices will need to be identified and improved, and production of wave devices will need to become much cheaper.

OTHER SOURCES

In addition to the eighteen energy sources discussed above, there are some other potential sources that have been discussed in the energy literature, but which have not reached the stage of application. These include: ocean thermal (which would produce energy from the temperature differential between surface and deep ocean water), "zero-point" and other "free energy" sources (which are asserted to harvest energy from the vacuum of space, but which have never been shown to work as claimed), Earth-orbiting solar collectors (which would beam electrical energy back to the planet in the form of microwave energy), Helium 3 from the Moon (Helium 3 does not exist in harvestable quantities on Earth, but if it could be mined on the Moon and brought back by shuttle, it could power nuclear reactors more safely than uranium does), and methane hydrates (methane frozen in an ice lattice—a material that exists in large quantities in tundra and seabeds, but has never successfully been harvested in commercially signifiant quantities). Of these, only methane hydrate has any prospect of yielding commercial amounts of energy in the foreseeable future; and even that will depend upon significant technological developments to enable the collecting of this fragile material. Methanol and butanol are not discussed here because their properties and prospects differ little from those of other biofuels.

Thus, over the course of the next decade or two, society's energy almost certainly must come from some combination of the eighteen sources above. In the next section we explore some of the opportunities for combining various of these alternative energy options to solve the evolving energy crisis.

TABLE 2: COMPARING CURRENT FUEL SOURCES

	Annual electricity produced (TWh)	Reserves	EROEI
Fossil Fuels	11,455	finite	Coal 50:1 Oil 19:1 Natural gas 10:1

	Annual electricity produced (TWh)	Potential electricity production (TWh)	EROEI
Hydropower	2894	8680	11:1 to 267:1
Nuclear	2626	5300	1.1:1 to 15:1
Wind	160	83,000	18:1
Biomass power	218	NA	NA
Solar PV	8	2000	3.75:1 to 10:1
Geothermal	63	1000 – 1,000,000	2:1 to 13:1
Solar thermal	1	up to 100,000	1.6:1
Tidal	.6	450	~ 6:1
Wave	~ 0	750	15:1

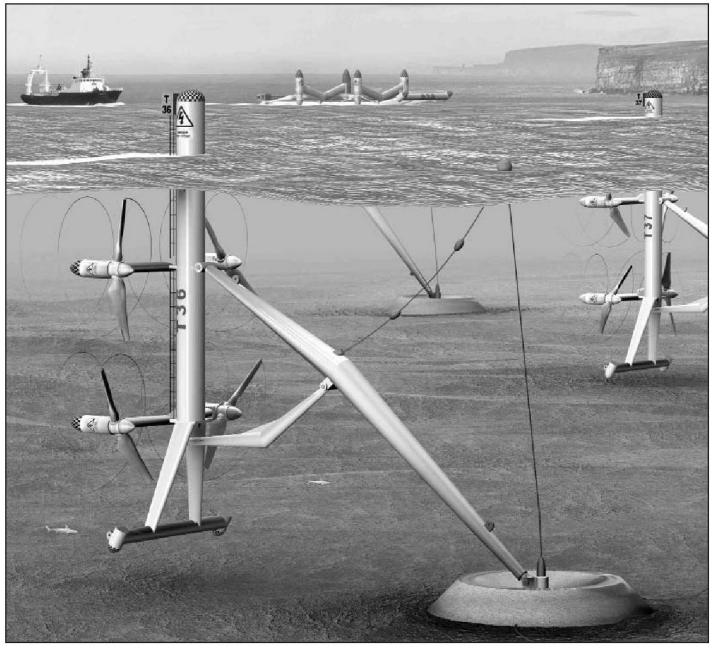
Table 2. Global annual electricity generation in terawatt-hours, estimated existing reserve or potential yearly production, and EROEI.[9] The largest current source of electricity (fossil fuels) has no long-term future, while the sources with the greatest potential are currently the least developed.

TABLE 3. COMPARING LIQUID FUEL SOURCES

	Global production (million barrels/year)	Reserves (trillion barrels)	EROEI
Oil	27,000	1.2	19:1
Tar sands	548	3.3	5.2:1 to 5.8:1
Oil shale	1.6	2.8	1.5:1 to 4:1

	Global production (million barrels/year)	Potential production (million barrels/year)	EROEI
Ethanol	260	1175	0.5:1 to 8:1
Biodiesel	5	255	1.9:1 to 9:1

Table 3. Liquid fuels: Current global annual production, reserves, potential production, and EROEI.[9]



Wave energy systems, such as depicted here, remain highly theoretical in practical terms. So far, the only operating commercial system is the Agucadora Wave Park off the coast of Portugal, recently pulled from service. Research continues, however, as wave energy releases no greenhouse gasses and for communities near shorelines it may yet prove practical, and with a high net energy potential. It could form a useful part of any mix of alternative renewable energy systems.

Five

TOWARD A FUTURE ENERGY MIX

A CURSORY EXAMINATION of our current energy mix yields the alarming realization that about 85 percent of our current energy is derived from three primary sources—oil, natural gas, and coal—that are non-renewable, whose price is likely to trend higher (and perhaps very steeply higher) in the years ahead, whose EROEI is declining, and whose environmental impacts are unacceptable. While these sources historically have had very high economic value, we cannot rely on them in the future. Indeed, the longer the transition to alternative energy sources is delayed, the more difficult that transition will be unless some practical mix of alternative energy systems can be identified that will have superior economic and environmental characteristics.

A process for designing an energy system to meet society's future needs must start by recognizing the practical limits and potentials of the available energy sources. Since *primary* energy sources (ones that are capable of replacing fossil fuels in terms of their percentage of the total energy supplied) will be the most crucial ones for meeting those needs, it is important to identify those first. Secondary sources (ones that are able to supply only a few percent of total energy) will also play their roles, along with "energy carriers" (forms of energy that make energy from primary sources more readily useful—as electricity makes the energy from coal useful in millions of homes).

A future primary energy source, at a minimum, must meet these make-or-break standards:

- It must be capable of providing a substantial amount of energy—perhaps a quarter of all the energy currently used nationally or globally;
- It must have a net energy yield of 10:1 or more;
- It cannot have unacceptable environmental (including climate), social, or geopolitical impacts (such as one nation gaining political domination over others); and
- It must be renewable.

A PROCESS OF ELIMINATION

Assuming that oil, natural gas, and coal will have rapidly diminishing roles in our future energy mix, this leaves fifteen alternative energy sources with varying economic profiles and varying environmental impacts. Since even the more robust of these are currently only relatively minor contributors to our current energy mix, this means our energy future will look very different from our energy present. The only way to find out what it might look like is to continue our process of elimination.

If we regard large contributions of climate-changing greenhouse gas emissions as a non-negotiable veto on future energy sources, that effectively removes tar sands and oil shale from the discussion. Efforts to capture and sequester carbon from these substances during processing would further reduce their already-low EROEI and raise their already-high production costs, so there is no path that is both economically realistic and environmentally

responsible whereby these energy sources could be scaled up to become primary ones. That leaves thirteen other candidates.

Biofuels (ethanol and biodiesel) must be excluded because of their low EROEI, and also by limits to land and water required for their production. (Remember: We are not suggesting that any energy source cannot play *some* future role; we are merely looking first for primary sources—ones that have the potential to take over all or even a significant portion of the current role of conventional fossil fuels.)

Energy-from-waste is not scalable; indeed, the "resource" base is likely to diminish as society becomes more energy efficient.

That leaves ten possibilities: nuclear, hydro, wind, solar PV, concentrating solar thermal, passive solar, biomass, geothermal, wave, and tidal.

Of these, nuclear and hydro are currently producing the largest amounts of energy. Hydropower is not without problems, but in the best instances its EROEI is very high. However, its capacity for growth in the U.S. is severely limited—there are not enough available undammed rivers—and worldwide it cannot do more than triple in capacity. Nuclear power will be slow and expensive to grow. Moreover, there are near-term limits to uranium ores, and technological ways to bypass those limits (e.g., with thorium reactors) will require time-consuming and expensive research. In short, both hydrower and nuclear power are unlikely candidates for rapid expansion to replace fossil fuels.

Biomass energy production is likewise limited in scalability, in this case by available land and water, and by the low efficiency of photosynthesis. America and the world could still obtain more energy from biomass, and production of *biochar* (a form of charcoal, usually made from agricultural waste, used as a soil amendment) raises the possibility of a synergistic process that would yield energy while building topsoil and capturing atmospheric carbon (though some analysts doubt this because pyrolysis, the process of making charcoal, emits not only CO_2 but other hazardous pollutants as well). Competition with other uses of biomass for food and for low-energy input agriculture will limit the amount of plant material available for energy production. Realistically, given the limits mentioned, biomass cannot be expected to sustainably produce energy on the scale of oil, gas, or coal.

Passive solar is excellent for space heating, but does not generate energy that could be used to run transportation systems and other essential elements of an industrial society.

That leaves six sources: Wind, solar PV, concentrating solar thermal, geothermal, wave, and tidal—which together currently produce only a tiny fraction of total world energy. And each of these still has its own challenges—like intermittency or limited growth potential.

Tidal, wave power, and geothermal electricity generation are unlikely to be scalable; although geothermal heat pumps can be used almost anywhere, they cannot produce primary power for transport or electricity grids.

Solar photovoltaic power is still expensive. While cheaper PV materials are now beginning to reach the market, these generally rely on rare substances whose depletion could limit deployment of the technology. Concentrating PV promises to solve some of these difficulties; however, more research is needed and the problem of intermittency remains.

With good geographical placement, wind and concentrating solar thermal have good net energy characteristics and are already capable of producing power at affordable prices. These may be the best candidates for non-fossil primary energy sources—yet again they suffer from intermittency.

Thus there is no single "silver-bullet" energy source capable of replacing conventional fossil fuels directly—at least until the problem of intermittency can be overcome—though several of the sources discussed already serve, or are capable of serving, as secondary energy sources.

This means that as fossil fuels deplete, and as society reduces reliance on them in order to avert catastrophic climate impacts, we will have to use every available alternative energy source strategically. Instead of a silver bullet, we have in our arsenal only BBs, each with a unique profile of strengths and weaknesses that must be taken into account.

But since these alternative energy sources are so diverse, and our ways of using energy are also diverse, we will have to find ways to connect source, deliv-

ery, storage, and consumption into a coherent system by way of common energy carriers.

COMMON CARRIERS: ELECTRICITY AND HYDROGEN

While society uses oil and gas in more or less natural states (in the case of oil, we refine it into gasoline or distil it into diesel before putting it into our fuel tanks), we are accustomed to transforming other forms of energy (such as coal, hydro, and nuclear) into electricity—which is energy in a form that is easy and convenient to use, transportable by wires, and that operates motors and a host of other devices with great efficiency.

With a wider diversity of sources entering the overall energy system, the choice of an energy carrier, and its further integration with transportation and space heating (which currently primarily rely on fossil fuels directly), become significant issues.

For the past decade or so energy experts have debated whether the best energy carrier for a post-fossil fuel energy regime would be electricity or hydrogen.[16] The argument for hydrogen runs as follows: Our current transportation system (comprised of cars, trucks, ships, and aircraft) uses liquid fuels almost exclusively. A transition to electrification would take time, retooling, and investment, and would face difficulties with electricity storage (discussed in more detail below): moreover, physical limits to the energy density by weight of electric batteries would mean that ships, large trucks, and aircraft could probably never be electrified in large numbers. The problem is so basic that it would remain even if batteries were substantially improved.

Hydrogen could more effectively be stored in some situations, and thus might seem to be a better choice as a transport energy carrier. Moreover, hydrogen could be generated and stored at home for heating and electricity generation, as well as for fueling the family car.

However, because hydrogen has a very low energy density per unit of volume, storage is a problem in this case as well: hydrogen-powered airplanes would need enormous tanks representing a substantial proportion of the size of the aircraft, and automobiles would need much larger tanks as well.



Moreover, several technological hurdles must be overcome before fuel cells—which would be the ideal means to convert the energy of hydrogen into usable electricity—can be widely affordable. And since conversion of energy is never 100 percent efficient, converting energy from electricity (from solar or wind, for example) to hydrogen for storage before converting it back to electricity for final use will inevitably entail significant inefficiencies.

The problems with hydrogen are so substantial that many analysts have by now concluded that its role in future energy systems will be limited (we are likely never to see a "hydrogen economy"), though for some applications it may indeed make sense.

Industrial societies already have an infrastructure for the delivery of electricity. Moreover, electricity enjoys some inherent advantages over fossil fuels: it can be converted into mechanical work at much higher efficiencies than can gasoline burned in internal combustion engines, and it can be transported long distances much more easily than oil (which is why high-speed trains in Europe and Japan run on electricity rather than diesel).

But if electricity is chosen as a systemic energy carrier, the problems with further electrifying transport using renewable energy sources such as wind, solar, geothermal, and tidal power remain: how to overcome the low energy density of electric batteries, and how to efficiently move electricity from remote places of production to distant population centers?[17]

ENERGY STORAGE AND TRANSMISSION

The energy densities by weight of oil (42 megajoules per kilogram), natural gas (55 MJ/kg), and coal (20 to 35 MJ/kg) are far higher than those of any electricity storage medium currently available. For example, a typical lead-acid battery can store about 0.1 MJ/kg, about one-fifth of 1 percent of the energy-per-pound of natural gas. Potential improvements to lead-acid batteries are limited by chemistry and thermodynamics, with an upper bound of less than 0.7 MJ/kg.

Lithium-ion batteries have improved upon the energy density of lead-acid batteries by a factor of about 6, achieving around 0.5 MJ/kg; but their theoretical energy density limit is roughly 2 MJ/kg, or perhaps 3 MJ/kg if research on the substitution of silicon for carbon in the anodes is realized in a practical way. On the other hand, supplies of lithium are limited, and therefore not scaleable.

It is possible that other elements could achieve higher energy storage by weight. In principle, compounds of hydrogen-scandium, if they could be made into a battery, could achieve a limit of about 5 MJ/kg. Thus the best existing batteries get about 10 percent of what is physically possible and 25 percent of the demonstrated upper bound.

Energy can be stored in electric fields (via capacitors) or magnetic fields (with superconductors). While the best capacitors today store one-twentieth the energy of an equal mass of lithium-ion batteries, a new company called EEstor claims a ceramic capacitor capable of 1 MJ/kg. Existing magnetic energy storage systems store around 0.01 MJ/kg, about equal to existing capacitors, though electromagnets made of high-temperature superconductors could in theory store about 4 MJ per liter, which is similar to the performance of the best imaginable batteries.

Chemical potential energy (a property of the atomic or molecular structure of materials that creates the potential for energy to be released and converted into usable forms—as is the case with fossil fuels and other combustible matter) can be stored as inorganic fuel that is oxidized by atmospheric oxygen. Zinc air batteries, which involve the oxidation of zinc metal to zinc hydroxide, could achieve about 1.3 MJ/kg, but zinc oxide could theoretically beat the best imagined batteries at about 5.3 MJ/kg.

Once again, hydrogen can be used for storage. Research is moving forward on building-scale systems that will use solar cells to split water into hydrogen and oxygen by day and use a fuel cell to convert the gases to electricity at night.[99] However, as discussed above, this technology is not yet economical.[100]

Better storage of electricity will be needed at several points within the overall energy system if fossil fuels are to be eliminated. Not only will vehicles need efficient batteries, but grid operators relying increasingly on intermittent sources like wind and solar will need ways to store excess electricity at moments of over-abundance for times of peak usage or scarcity. Energy storage on a large scale is already accomplished at hydroelectric dams by pumping water uphill into reservoirs at night when there is a surplus of electricity: energy is lost in the process, but a net economic benefit is realized in any case. This practice could be expanded, but it is limited by the number and size of existing dams, pumps, and reservoirs. Large-scale energy storage by way of giant flywheels is being studied, but such devices are likely to be costly.

The situation with transmission is also daunting. If large amounts of wind and solar energy are to be sourced from relatively remote areas and integrated into national and global grid systems, new high-capacity transmission lines will be needed, along with robust two-way communications, advanced sensors, and distributed computers to improve the efficiency, reliability, and safety of power delivery and use.

For the U.S. alone, the cost of such a grid upgrade would be $100 billion at a minimum, according to one recent study.[101] The proposed new system that was the basis of the study would include 15,000 circuit miles of extremely high voltage lines, laid alongside the existing electric grid infrastructure, starting in the Great Plains and Midwest (where the bulk of the nation's wind resources are located) and terminating in the major cities of the East Coast. The cost of building wind turbines to generate the amount of power assumed in the study would add another $720 billion, spent over a fifteen-year period and financed primarily by utilities and investors.

Yet, this hypothetical project would enable the nation to obtain only 20 percent of its electricity from wind by 2024. If a more rapid and complete transition away from fossil fuels is needed or desired, the costs would presumably be much higher.

However, many energy analysts insist that long high-capacity power lines would *not* be needed for a renewable energy grid system: such a system would best take advantage of regional sources—off-shore wind in the U.S. Northeast, active solar thermal in the desert Southwest, hydropower in the Northwest, and biomass in the forested Southeast. Such a decentralized or "distributed" system would dispense not only with the need for costly high-capacity power line construction but would also avoid fractional power losses associated with long-distance transmission.[99] Still, problems remain: one of the advantages of a continent-scale grid system for renewables would be its ability to compensate for the intermittency of energy sources like wind and solar. If skies are overcast in one region, it is likely that the sun will still be shining or winds blowing elsewhere on the continent. Without a long-distance transmission system, there must be some local solution to the conundrum of electricity storage.

TRANSITION PLANS

As noted above, there is an existing literature of plans for transitioning U.S. or world energy systems away from fossil fuels. It would be impossible to discuss those plans here in any detail, except to remark that some of those proposals include nuclear power[100] while some exclude it[101]. And some see a relatively easy transition to solar and wind[102], while others do not[103].

The present analysis, which takes into account EROEI and other limits to available energy sources, suggests first that the transition is inevitable and necessary (as fossil fuels are rapidly depleting and are also characterized by rapidly declining EROEI), and that the transition will be neither easy nor cheap. Further, it is reasonable to conclude from what we have seen that a full replacement of energy currently derived from fossil fuels with energy from alternative sources is probably impossible over the short term; it may be unrealistic to expect it even over longer time frames.

The core problem, which is daunting, is this: How can we successfully replace a concentrated store of solar energy (i.e., fossil fuels, which were formed from plants that long ago bio-chemically captured and stored the energy of sunlight) with a *flux* of solar energy (in any of the various forms in which it is available, including sunlight, wind, biomass, and flowing water)?

It is not within the purpose of this study to design yet another detailed transition plan. Such exercises are useful, but inevitably decisions about how much of a hypothetical energy mix should come from each of the potential sources (wind, solar, geothermal, etc.) depend on projections regarding technological developments and economic trends. The final plan may consist of a complex set of scenarios, with increasing levels of detail adding to the document's value as an analytical tool; yet all too often real-world political and economic events turn such scenarios into forgotten pipe-dreams.

The actual usefulness of energy transition plans is more to show what is possible than to forecast events. For this purpose, even very simple exercises can sometimes be helpful in pointing out problems of scale. For example, the following three scenarios for world energy, which assume only a single alternative energy source using extremely optimistic assumptions, put humanity's future energy needs into a sobering cost perspective.[104]

Scenario 1: The World at American Standards. If the world's population were to stabilize at 9 billion by 2050, bringing the entire world up to U.S. energy consumption (100 quadrillion BTU annually) would require 6000 quads per year. This is more than twelve times current total world energy production. If we assume that the cost of solar panels can be brought down to 50 cents per watt installed (one tenth the current cost and less than the current cost of coal), an investment of $500 trillion would be required for the transition, not counting grid construction and other ancillary costs—an almost unimaginably large sum. This scenario is therefore extremely unlikely to be realized.

Scenario 2: The World at European Standards. Since Europeans already live quite well using only half as much energy as Americans, it is evident that a U.S. standard of living is an unnecessarily high goal for the world as a whole. Suppose we aim for a global per-capita consumption rate 70 percent lower than that in the United States. Achieving this standard, again assuming a population of 9 billion, would require total energy production of 1800 quads per year, still over three times today's level. Cheap solar panels to provide this much energy would cost $150 trillion, a number over double the current world annual GDP. This scenario is conceivable, but still highly unlikely.

Scenario 3: Current per-Capita Energy Usage. Assume now that current world energy usage is maintained on a per-capita basis. If people in less-industrialized nations are to consume more, this must be compensated for by reduced consumption in industrial nations, again with the world's population stabilizing at 9 billion. In this case, the world would consume 700 quads of energy per year. This level of energy usage, if it were all to come from cheap solar panels, would require $60 trillion in investment—still an enormous figure, though one that might be achievable over time. (Current average per-capita consumption globally is 61 gigajoules per year; in Qatar it is 899 GJ per year, in the U.S. it is 325 GJ per year, in Switzerland it is 156 GJ per year, and in Bangladesh it is 6.8 GJ per year. The range is very wide. If Americans were to reduce their energy use to the world average, this would require a contraction to less than one-fifth of current consumption levels, but this same standard would enable citizens of Bangladesh to increase their per-capita energy consumption nine-fold.)

Of course, as noted above, all three scenarios are extremely simplistic. On one hand, they do not take into account amounts of energy already coming from hydro, biomass, etc., which could presumably be maintained: it would not be necessary to produce all needed energy from new sources. But on the other hand, costs for grid construction and electrification of transport are not included. Nor are material resource needs accounted for. Thus on balance, the costs cited in the three scenarios are if anything probably dramatically understated.

The conclusion from these scenarios seems inescapable: unless energy prices drop in an unprecedented and unforeseeable manner, the world's economy is likely to become increasingly energy-constrained as fossil fuels deplete and are phased out for environmental reasons. It is highly unlikely that the entire world will ever reach an American or even a European level of energy consumption, and even the maintenance of current energy consumption levels will require massive investment.



TABLE 4. ENERGY USE BY (SELECTED) COUNTRIES, 2006 *(Source: U.S. Energy Information Administration[87])*

COUNTRY	Per capita energy use (Million Btu)	Total energy use (Quadrillion Btu)	COUNTRY	Per capita energy use (Million Btu)	Total energy use (Quadrillion Btu)
Afghanistan	0.6	0.018	Korea, South	193.4	9.447
Albania	34.3	0.123	Kuwait	469.8	1.136
Algeria	46.6	1.536	Laos	3.6	0.023
Angola	13.7	0.165	Lebanon	53.3	0.207
Argentina	79	3.152	Liberia	2.5	0.008
Australia	276.9	5.611	Libya	132	0.779
Austria	187.2	1.534	Lithuania	97	0.348
Bangladesh	5	0.743	Madagascar	2.2	0.042
Belgium	265.1	2.751	Malaysia	104.8	2.557
Benin	4.9	0.039	Mali	1.1	0.013
Bolivia	24.2	0.218	Mexico	68.5	7.357
Botswana	33.1	0.059	Mongolia	33	0.096
Brazil	51.2	9.635	Morocco	15.2	0.508
Bulgaria	121.5	0.897	Mozambique	10.6	0.218
Burkina Faso	1.3	0.019	Namibia	29.3	0.06
Burma (Myanmar)	5	0.236	Nepal	2.4	0.068
Cambodia	0.7	0.01	Netherlands	250.9	4.137
Cameroon	5	0.088	New Zealand	211.2	0.864
Canada	427.2	13.95	Nicaragua	12.8	0.071
Chad	0.3	0.003	Niger	1.3	0.017
Chile	77.6	1.254	Nigeria	7.8	1.023
China	56.2	73.808	Norway	410.8	1.894
Colombia	29.8	1.305	Pakistan	14.2	2.298
Congo (Kinshasa)	1.6	0.097	Peru	21.6	0.613
Costa Rica	43.6	0.178	Philippines	14.2	1.271
Croatia	92.1	0.414	Poland	100.1	3.856
Cuba	35.1	0.399	Qatar	1,023.3	0.906
Czech Republic	176.6	1.808	Romania	75.2	1.678
Denmark	161.3	0.879	Russia	213.9	30.386
Ecuador	31	0.42	Rwanda	1.4	0.013
Egypt	32.2	2.544	Saudi Arabia	255	6.891
El Salvador	19.2	0.131	Senegal	6.9	0.084
Estonia	175.2	0.232	Sierra Leone	2.8	0.017
Ethiopia	1.4	0.103	Singapore	476.8	2.142
France	180.7	11.445	Solomon Islands	5.4	0.003
Germany	177.5	14.629	Somalia	1.2	0.01
Ghana	7.1	0.159	South Africa	117.2	5.177
Greece	139.1	1.487	Spain	161.2	6.51
Greenland	149.3	0.008	Sri Lanka	10.5	0.218
Guatemala	16.3	0.202	Sudan	4.8	0.185
Guinea	2.4	0.023	Swaziland	15	0.017
Guyana	29.4	0.023	Sweden	245.8	2.216
Haiti	3.3	0.028	Switzerland	170.7	1.284
Honduras	17.3	0.127	Syria	42.9	0.81
Hong Kong	167.7	1.164	Taiwan	200.6	4.569
Hungary	114.7	1.145	Tanzania	2.1	0.08
Iceland	568.6	0.17	Thailand	57.9	3.741
India	15.9	17.677	Turkey	55.5	3.907
Indonesia	17.9	4.149	Uganda	1.2	0.035
Iran	118.2	7.686	Ukraine	125.9	5.871
Iraq	46.6	1.247	United Arab Emirates	577.6	2.464
Ireland	173.4	0.704	United Kingdom	161.7	9.802
Israel	123.5	0.848	United States	334.6	99.856
Italy	138.7	8.069	Uruguay	38.8	0.134
Japan	178.7	22.786	Venezuela	124.4	3.191
Jordan	52.2	0.308	Vietnam	16.6	1.404
Kazakhstan	195.3	2.975	Yemen	12.4	0.267
Kenya	5.6	0.202	Zambia	11.1	0.126
Korea, North	41.1	0.949	Zimbabwe	15	0.183



ANITA BOYSEN

In many cities of the world, there's a renaissance in bicycle travel, and new public accommodations to bicyclists: pathways, car-free roads and parks, new rules of the road that favor bicycles, bike racks on public busses, bike cars on commute trains, etc. All seem small-scale compared to the immensity of the energy crisis, but they create a "can do" spirit, self-reliance, and a transformational ethic, so other conservation steps—emphasis on light rail, dedicated bus lanes, fees for cars downtown, higher parking rates—begin to be practical. And it's fun and healthy.

Six

THE CASE FOR CONSERVATION

THE CENTRAL ISSUE REMAINS—how to continue supplying energy in a world where resources are limited and declining. The solution becomes much easier if we find ways to proactively *reduce* energy demand. And that project in turn becomes easier if there are fewer of us wanting to use energy (that is, if population shrinks rather than continuing to increase).

Based on all that we have discussed, the clear conclusion is that the world will almost certainly have considerably less energy available to use in the future, not more, though (regrettably) this strong likelihood is not yet reflected in projections from the International Energy Agency or any other notable official source. Fossil fuel supplies will almost surely decline faster than alternatives can be developed to replace them. New sources of energy will in many cases have *lower* net energy profiles than conventional fossil fuels have historically had, and they will require expensive new infrastructure to overcome problems of intermittency, as we have discussed.

Moreover, the current trends toward declining energy demand, combined with falling investment rates for new energy supplies (especially for fossil fuels), resulting from the ongoing global economic crisis, are likely to continue for several years, thus complicating both a general recognition of the problem and a coordinated response.

How far will supplies fall, and how fast? Taking into account depletion-led declines in oil and natural gas production, a leveling off of energy from coal, and the recent shrinkage of investment in the energy sector, it may be reasonable to expect a reduction in global energy availability of 20 percent or more during the next quarter century. Factoring in expected population growth, this implies substantial *per-capita* reductions in available energy. These declines are unlikely to be evenly distributed among nations, with oil and gas importers being hardest hit, and with the poorest countries seeing energy consumption returning to pre-industrial levels (with energy coming almost entirely from food crops and forests and work being done almost entirely by muscle power).

Thus, the question the world faces is no longer *whether* to reduce energy consumption, but *how*. Policy makers could choose to manage energy unintelligently (maintaining fossil fuel dependency as long as possible while making poor choices of alternatives, such as biofuels or tar sands, and insufficient investments in the far more promising options such as wind and solar). In the latter case, results will be catastrophic. Transport systems will wither (especially ones relying on the most energy-intensive vehicles—such as airplanes, automobiles, and trucks). Global trade will contract dramatically, as shipping becomes more costly. And energy-dependent food systems will falter, as chemical input and transport costs soar. All of this could in turn lead to very high long-term unemployment and perhaps even famine.

However, if policy makers manage the energy downturn intelligently, an acceptable quality of life could be maintained in both industrialized and less-industrialized nations at a more equitable level than today; at the same time, greenhouse gas emissions could be reduced dramatically. This would require a significant public campaign toward the establishment of a new broadly accepted conservation ethic to replace current emphases on never-ending growth and over-consumption at both personal and institutional-corporate levels. We will not attempt here a full list of the needed shifts, but they might well include the following practical, engineering-based efforts:

- Immediate emphasis on and major public investment in construction of highly efficient rail-based transit systems and other public transport systems (including bicycle and pedestrian pathways), along with the redesign of cities to reduce the need for motorized human transport.[109]
- Research, development, and construction of electricity grid systems that support distributed, intermittent, renewable energy inputs.
- Retrofit of building stock for maximum energy efficiency (energy demand for space heating can be dramatically reduced through super-insulation of structures and by designing to maximize solar gain).[110]
- Reduction of the need for energy in water pumping and processing through intensive water conservation programs (considerable energy is currently used in moving water, which is essential to both agriculture and human health).[111]

As well, the following policy-based initiatives will be needed:

- Internalization of the full costs of energy to reflect its true price. Elimination of perverse energy subsidies, especially all upstream and production-side state support. Encourage government "feed-in tariffs" that favor ecologically sustainable renewable energy production.
- Application of the ten energy assessment criteria listed in this document to all energy technologies that are currently being proposed within the UN climate negotiations, for "technology transfer" from rich countries to poor.
- Re-localization of much economic activity (especially the production and distribution of essential bulky items and materials) in order to lessen the need for transport energy[112]; correspondingly, a reversal of the recent emphasis on inherently wasteful globalized economic systems.
- Rapid transition of food systems away from export oriented industrial production, toward more local production for local consumption, thus reducing mechanization, energy inputs, petro-chemicals and transport costs. Also, increased backing for permaculture, and organic food production. And, firm support for traditional local Third World farming communities in their growing resistance to industrial export agriculture.
- A major shift toward *re-ruralization*, i.e., creating incentives for people to move back to the land, while converting as much urban land as possible to sustainable food production, including substantial suburban lands currently used for decorative lawns and gardens.
- Abandonment of *economic growth* as the standard for measuring economic progress, and establishment of a more equitable universal standard of "sufficiency."
- Increase of reserve requirements on lending institutions to restrain rampant industrial growth until price signals are aligned to reflect full costs. Restrictions on debt-based finance.
- Development of indicators of economic health to replace the current GDP calculus with one that better reflects the general welfare of human beings.
- *Re-introduction* of the once popular "import substitution" (from the 1930s) model whereby nations determine to satisfy basic needs—food, energy, transport, housing, healthcare, etc.—*locally* if they possibly can, rather than through global trade.
- Establishment of international protocols on both energy assessment (including standards for assessing EROEI and environmental impacts) and also technology assessment. The latter should include full lifecycle energy analysis, along with the prin-

ciples of "polluter pays" and the "precautionary principle."

- Adoption of international depletion protocols for oil, gas and coal—mandating gradual reduction of production and consumption of these fuels by an annual percentage rate equal to the current annual depletion rate, as outlined in the present author's previous book, *The Oil Depletion Protocol*, so as to reduce fuel price volatility.
- Transformation of global trade rules to reward governments for, rather than restraining them from, protecting and encouraging the localization of economic production and consumption patterns.
- Aggressive measures for "demand-side management" that reduce overall energy needs, particularly for power grids. This would be part of a society-wide "powering down," i.e., a planned reduction in overall economic activity involving energy, transport and material throughputs, emphasizing conservation over new technology as the central solution to burgeoning problems.
- International support for women's reproductive and health rights, as well as education and opportunity, as important steps toward mitigation of the population crisis, and its impact on resource depletions.
- The return of control of the bulk of the world's remaining natural resources from corporations and financial institutions in the industrialized countries to the people of the less industrialized nations where those resources are located.

The goal of all these efforts must be the realization of a no-growth, *steady-state* economy, rather than a growth-based economy. This is because energy and economic activity are closely tied: without continuous growth in available energy, economies cannot expand. It is true that improvements in efficiency, the introduction of new technologies, and the shifting of emphasis from basic production to provision of services can enable some economic growth to occur in specific sectors without an increase in energy consumption. But such trends have inherent bounds. Over the long run, static or falling energy supplies must be reflected in economic stasis or contraction. However, with proper



planning there is no reason why, under such circumstances, an acceptable quality of life could not be maintained.[13] For the world as a whole, this might entail the design of a deliberate plan for global redistribution of energy consumption on a more equitable basis, with industrial nations reducing consumption substantially, and less-industrial nations increasing their consumption somewhat in order to foster global "sufficiency" for all peoples. Such a formula might partly make up for centuries of colonial expropriation of the resources of the world's poor countries, a historical factor that had much to do with the rapid industrial growth of the wealthy resource-hunting countries during the past 150 years. Addressing this disparity might help provide the poorer countries a chance for survival, if not equity.

Here's some good news: A considerable literature exists on how people in recently affluent nations can reduce energy consumption while actually increasing levels of personal satisfaction and community resilience.[14] The examples are legion, and include successful community gardens, rideshare, job-share, and broad local investment and conservation programs, such as Jerry Mander briefly mentions in the Foreword, including most notably the Transition Towns movement that is now sweeping Europe and beginning in the U.S. as well.



While the subject is, strictly speaking, beyond the scope of this booklet, it must also be noted and underscored that global conservation efforts are and will be required with regard to *all* natural resources (not just energy resources). The Earth's supplies of high-grade ores are limited, and shortages of a wide range of minerals, including phosphorus, coltan, and zinc, are already occurring or expected within the next few decades if current consumption patterns continue. Deforestation, loss of topsoil due to erosion, and the (in many cases) catastrophic and irreversible decline of wild fish species in the oceans are also serious problems likely to undermine economic activity and human well-being in the years ahead. Thus, all standard operating assumptions about the future of industrial society are clearly open to doubt.

Societal adaptation to resource limits inevitably also raises the question of population. When population grows but the economy remains the same size, there are fewer economic goods available per person. If energy and material constraints effectively impose a cap on economic growth, then the only way to avert continuing declines in per-capita access to economic goods is to limit population by, for example, providing economic incentives for smaller families rather than larger ones (Note: in the United States larger families are now rewarded with lower taxes), as well as easy access to birth control, and support for poor women to obtain higher levels of education. Policy makers must begin to see population shrinkage as a goal, rather than an impediment to economic growth.

In his book *Energy at the Crossroads*[19], Vaclav Smil shows the relationship between per capita energy consumption and various indices of well-being. The data appear to show that well-being requires at least 50 to 70 GJ per capita per year. As consumption above that level slightly expands, a sense of well being also expands, but only up to about 100 GJ per capita, a "safety margin" as it were. Remarkably however, above and beyond that level of consumption, there is no increase in a sense of well being. In fact the more consumptive and wealthy we become, the less content and satisfied we apparently are. One wonders whether the effort needed to expand material wealth and consumption have their own built-in dissatisfactions in terms of challenges to free time, added daily pressures, reduced family contact, engagement with nature, and personal pleasures. North America's energy consumption is currently about 325 GJ per annum. Using these indices as goals, and with a general notion of the total amount of energy that will be available from renewable energy sources, it should then be possible to set a target for a population size and consumption levels that would balance these factors.

Energy conservation can take two fundamental forms: curtailment and efficiency. *Curtailment* describes situations where uses of energy are simply discontinued (for example, we can turn out the lights in rooms as we vacate them). *Efficiency* describes situations where less energy is used to provide an equivalent benefit (a related example would be the replacement of incandescent bulbs with compact fluorescents or LEDs). Efficiency is typically preferred, since few people want to give up tangible benefits, but efficiency gains are subject to the law of diminishing returns (the first ten percent gain may be cheap and easy, the next ten percent will be somewhat more costly, and so on), and there are always ultimate limits to possible efficiency gains (it is impossible to light homes at night or to transport

goods with zero energy expenditure). Nevertheless, much could be achieved over the short term in energy efficiency across all sectors of the economy.

Curtailment of use is the quickest and cheapest solution to energy supply problems. Given the reality that proactive engagement with the inevitable energy transition has been delayed far too long, curtailment (rather than efficiency or replacement with alternative sources) will almost certainly need to occur, especially in wealthy nations. But even granting this, proactive effort will still be crucial, as planned and managed curtailment will lead to far less societal disruption than ad hoc, unplanned curtailment in the forms of electrical blackouts and fuel crises.

The transition to a steady-state economy will require a revision of economic theories and a redesign of financial and currency systems.[176] These efforts will almost certainly be required in any case if the world is to recover from the current economic crisis.

Realistic energy descent planning must begin at all levels of society. We must identify essential economic goods (obviously including food, water, shelter, education, and health care) and decouple these from discretionary consumption that in recent decades has been encouraged merely to stoke economic growth.

The UN negotiations on climate change leading up to the Copenhagen climate summit in December 2009, have presented an opportunity for the world to consider the centrality of energy conservation in cutting greenhouse gases, yet it is barely part of the official UN climate agenda. Much of the current policy discussion misguidedly focuses on expanding renewable energy sources, with little to no consideration of their ecological, economic, and practical limits. Energy efficiency is receiving increasing attention, but it must be seen as part of a clear conservation agenda aimed at reducing global demand for energy overall.

Surprisingly, a recent US-China memorandum of understanding on energy and climate listed conservation as its top bullet point among shared concerns. If the world's two largest energy consumers in fact believe this is their top priority, then it needs to come to the fore in global climate discussions.

However, the mandate of the UN climate talks does not include an official multilateral process to cooperate on energy descent. Negotiators increasingly express concern over energy supply issues but are without an international forum in which to address them.

The national security community appears now to take seriously threats related both to climate change and energy supply vulnerability. This could set a new context for post-Copenhagen international efforts to address these collective concerns so as to avoid violent conflict over depleting energy resources and climate disaster.

* * *

Our energy future will be defined by limits, and by the way we respond to those limits. Human beings can certainly live within limits: the vast majority of human history played out under conditions of relative stasis in energy consumption and economic activity; it is only in the past two centuries that we have seen spectacular rates of growth in economic activity, energy and resource consumption, and human population. Thus, a deliberate embrace of limits does not amount to the end of the world, but merely a return to a more normal pattern of human existence. We must begin to appreciate that the 20th century's highly indulgent, over-consumptive economic patterns were a one-time-only proposition, and cannot be maintained.

If the energy transition is wisely managed, it will almost certainly be possible to maintain, within this steady-state context, many of the benefits that our species has come to enjoy over the past decades—better public health, better knowledge of ourselves and our world, and wider access to information and cultural goods such as music and art.

As society adopts alternative energy sources, it will at the same time adopt new attitudes toward consumption, mobility, and population. One way or another, the transition away from fossil fuels will mark a turning point in history as momentous as the Agricultural Revolution or the Industrial Revolution.

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LOU DEMATTEIS

A familiar sight from Chevron and Texaco oil development in the Ecuadorian Amazon: giant oil fires in open waste pits.

THE INTERNATIONAL FORUM GLOBALIZATION (IFG) founded in 1993, is an international research, education and action alliance and organization, comprised of leading scholars, economists, and activists from all continents. IFG's focus has been toward the effects of a globalized economy upon the environment, political power, social justice and equity within and among nations. We express that mission with publications, private and public seminars, large public teach-ins, (such as in Seattle in 1999 and elsewhere), and movement organizing toward alternative economic systems. In 2004 we initiated work on the Triple Crisis, hosting a series of international strategy events and public teach-ins on climate change, peak oil, and global resource depletion. We are now helping coordinate international events on these concerns. This publication on "net energy" is part #4 in our False Solutions series.

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TYPICAL COAL-MINING SCENE ACROSS APPALACHIA: "MOUNTAIN TOP REMOVAL."

GLOBAL ENERGY QUANDARY

THE DESIGNERS OF THE GLOBAL ECONOMY sold us visions of never-ending growth, wealth, and abundance. But now, limits are everywhere apparent. Energy resources are fast dwindling, their prices ever more volatile, their uses more obviously destructive. After a century of indulgence, the party is over. Optimists say that new technology will save us; alternative energy systems will replace current ones. Economic growth will go on forever. *Is this true? Or are we singing old anthems on the deck of the Titanic?*

This astonishing report presents, for the first time, meticulous assessments of *all* the rescue scenarios and new energy paths, concluding that *no combination of old or new alternative energies can sustain industrial society as we have known it for the past century.* This is not great news, but denial is worse. This analysis is important for *everyone* in a position of leadership—domestic and international policy experts, public officials, think tanks, activists, media—as it explains why current assumptions about our energy options are unrealistic. New thinking is mandatory. And finally, *conservation* may prove the only winning strategy.

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Tom Whipple, Editor
Sharon Astyk, Commentary Editor

October 24, 2011

1. Oil and the Global Economy

For another week the global oil markets were largely driven by the prospects for settling the EU's sovereign debt crisis. The price rise which began in early October, taking Brent crude from $98 a barrel to the neighborhood of $112, continued through Wednesday when it became clear that negotiations between France and Germany over the debt crisis were at an impasse. Prices then fell with Brent closing out the week at $109.56 and NY oil at $87.40.

Although limited amounts of oil are now being exported from Libya, global markets remain tight, which is why OPEC is still averaging $108 a barrel for its oil. The death of Gadhafi last week brought to a close another chapter in the Arab uprising. The next few months will see whether the Libyans can form a government with enough strength to organize and provide security for oil production or whether disagreements among the various tribes, cities, and other factions will prevent Libyan oil exports from reaching significant levels in the next year or so. Some engineers are already talking about the damage that might have been done to the pressure of Libyan oil fields by the emergency shutdowns they underwent.

US commercial petroleum inventories fell by an unusually large 11 million barrels the week before last adding more credence to the IEA assertion that the world currently is burning more oil and other liquids than it is producing. Global stocks are still about 2.6 billion barrels so the drawdown can still go on for some time without much effect. Global oil prices have been trading over a $15 a barrel range centered on $110 since late spring. This price range is some $25 dollar a barrel higher than where oil traded for most of 2010 and is clearly exacting a toll on many economies.

The announcement that US combat forces will not be remaining in Iraq after the end of the year raises once again the question of whether the government will be able to provide sufficient security to allow major increases in oil production. Assassinations, bombings, and sabotage of oil facilities still take place on a regular basis. Increasing tensions in the region stemming from the Syrian, Bahraini, Yemeni, and Kurdish uprisings, and the numerous issues between Iran and many other states, all suggest that exploiting the world's last major deposit of cheap and easy to extract oil may not be all that easy.

A meeting of oil ministers in Paris last week provided the venue for a number of interesting assertions by senior officials of the IEA. The Agency believes that: the growth in oil demand would be "largely wiped out" by a double-dip recession; that the ongoing unrest in the Middle East might lead to underinvestment in oil production and higher prices in the year ahead; it is almost too late to limit global temperature increases to 2° C.; the world is faced with a dire future in which the average global temperatures rise by more than 3.5 C unless there are major innovations to lower the cost of clean energy and lower carbon emissions; and that they see less potential for an oil price spike in the next few months than they did a few months ago due to slowing economies.

2. The EU debt crisis

Most observers agree that a quick settlement to the EU's sovereign debt crisis is vital to continued global economic stability. Unless a way is found to heal permanently the hemorrhaging of Greece's economy, the problem will spread to the major European banks that hold the Greek debt and from there to Spain, Italy, Belgium and eventually France. Even Wall Street is threatened due to the massive credit default swaps it holds on Europe's debt. Taken to the extreme, the situation could ultimately result in severe damage to the global banking system and a major world-wide depression. In such a situation the significance of peaking global oil supplies likely would be lost in the midst of plummeting demand for oil.

Europe's leaders clearly understand the danger of the situation and are scrambling to find a solution that is not easily coming. Greece's economy seems to be in a death spiral with its people unwilling to make the sacrifices demanded by the rest of the EU and its deficits continuing to grow. A split has developed between Germany and France which are the only Eurozone countries large enough to affect a bailout. France, whose banks are heavily invested in Greece and other threatened Eurozone economies and would be damaged, if not wiped out, by widespread defaults, is seeking to solve the problem with European and global money rather than using its government credit to support French banks.

Germany has already committed $290 billion to a bailout fund for Greece, Portugal, and Ireland, and its voters are tired of bailing out what they see as bad financial management by other Eurozone members. Berlin, under pressure from the parliament, is refusing to bail out what it considers to be poor loans made by banks in other counties. The search for a solution jumps around from large write downs in the bad debts to various schemes to inflate European Financial Stability Facility (EFSF). So far all proposals have serious problems and serious opposition which is why the problem continues to be pushed ahead despite the urgency of the situation.

Despite constant incantations of optimism from various European leaders, which serve to push up the equity markets and the price of oil, many observers believe the debt situation has become so massive and complex that it is insoluble on more than a temporary basis. While some agreement may be cobbled together in the next week or two, it seems likely the underlying problem will around is some form or other for many years.

3. US oil consumption

As the world's largest consumer of oil products, just what is happening to oil consumption in the United States is always of interest. A new study says US drivers will spend about $490 billion filling their gas tanks this year which will be up by more than $100 billion over 2010. Three years ago when average gasoline prices got over $4 a gallon, demand for gasoline fell by only 3 percent. These high gasoline prices have become a part of life and not just a brief up and down as in 2008. Despite oil prices that have been running 60-80 cents a gallon higher than last year, gasoline consumption is only down some 1.3 percent last month from September 2010.

It seems that most drivers can't or won't reduce their fuel consumption and are taking the extra $100 billion from other purchases. Many say they are cutting back on food expenditures as they have few other options. America seems to be running into an "elasticity wall" at which lifestyles and lack of alternative transportation choices are keeping Americans in their cars right down to the end of their resources.

The API is reporting that total US petroleum imports fell by nearly 10 percent in September reflecting a 5 percent increase in domestic production during the last four weeks over last year as well as the continuing drawdown in US stocks which were 5.3 percent lower than a year earlier. It is possible that the general tightness of the global market without Libyan production and various reductions in non-OPEC production is making it more difficult for US refiners to find crude to import.

The API is also reporting a surge in the demand for distillates in September which recently has been running nearly 6 percent higher than last year. As it is difficult to see an increase of this size being consumed by a moribund US economy, it is likely that much of the increased demand for distillates is being exported. US oil product exports this year are up 24 percent over 2010. With global conventional oil production flat, much of the increase in demand is being satisfied by natural gas liquids and ethanol which are not substitutes for distillates.

If current trends continue, it is likely that we are going to see increasingly higher prices for distillates – diesel, fuel oil, and jet fuels – and that the availability of these oil products may become an issue before that of gasoline.

4. Fracking for gas

There was news on the fracking front last week as new rules were issued to control fracking of natural gas shale. As shale gas has come to be seen in many quarters as the salvation for the nation's problems by providing clean cheap energy, jobs, and tax revenues, the new rules are likely to become controversial as the industry seeks to have them overturned.

The EPA announced that it will issue national shale wastewater rules under the Clean Water Act that will set standards that drillers must meet before sending water that has been extracted from fracked wells to waste water facilities for treatment. It currently is illegal to discharge untreated waste water from fracking into streams or bodies of water. This move is separate from an ongoing study of the effects of fracking on drinking water. The new rules are to come into force in 2014.

While New York's temporary ban on drilling ended last week, the new rules issued with the lifting of the ban will prove to be onerous for many drilling companies unless they are modified. The new rules, which are expected to come into force next year, establish buffer zones around waterways and aquifers that are as much as 20 times wider than those found in fracking-friendly Pennsylvania. The rules would prohibit drilling within 500 feet of the state's 18 primary aquifers, within 4000 feet of the NY City and Syracuse watersheds and within 2000 feet of rivers and streams. NY City is also proposing that drilling be banned within seven miles of the aged underground aqueducts that bring water to major cities.

Numerous drilling companies already hold leases on tens of thousands of acres that would be closed under the new rules. After a 90-day comment period, the new regulations could be finalized and new drilling permits could be issued by mid-2012.

Quote of the week

- "Most economists view the economic growth of the last century and a half as being fueled by ongoing technological progress. Without question, that progress has been most impressive. But there may also have been an important component of luck in terms of finding and exploiting a resource that was extremely valuable and useful but ultimately finite and exhaustible. It is not clear how easy it will be to adapt to the end of that era of good fortune."

  -- James D. Hamilton

The Briefs (clips from recent *Peak Oil News* dailies are indicated by date and item #)

- California regulators have approved North America's first **cap-and-trade** program, setting limits on carbon emissions. The move represents the world's second-largest carbon control program after the European Union. (10/22, #14)
- U.S. officials have approved the first offshore oil-exploration plan submitted by **BP** since the Deepwater Horizon oil spill. (10/22, #17)

- Increasingly, **Iraq's** drive to expand its oil and natural gas industry, the country's economic lifeline, is becoming dependent on the government's ability to ensure security and, without US forces that looks to be a serious problem. (10/21, #8)
- **Lukoil** and its partners are poised to award a numerous contracts to international engineering and construction companies as it moves full speed ahead with development of its supergiant West Qurna Phase 2 in southern Iraq. (10/21, #9)
- **ExxonMobil, BP, and Eni** will spend around $100 billion to upgrade three oil fields in southern Iraq. About $50 billion would be spent to upgrade the big West Qurna Phase 1 oil field which is being developed by Exxon. The remaining $50 billion will be spent by BP and Eni to upgrade the Rumaila and Zubair oil fields, respectively. (10/20, #7)
- **Iraq** has agreed with oil majors to build a multi-billion-dollar oil field water injection plant in the south of the country, after disagreement over costs that suspended the project for months. (10/20, #8)
- **Iraq** is driving to build new oil refineries to increase capacity by 740,000 b/d as its postwar economy swells, part of a multibillion-dollar program under way across the Persian Gulf region. (10/20, #9)
- **Iraq's** crude oil production is expected to hit some 3 million b/d by the end of October from the current 2.9 million--the highest level reached since the US-led invasion in 2003. (10/18, #7)
- President **Chávez** of Venezuela declared on Thursday that he had beaten cancer, less than five months after revealing that he had undergone emergency surgery to remove a tumor while in seclusion in Cuba. (10/21. #11)
- **Statoil** announced its giant North Sea discovery Aldous Major South is estimated to contain double the volume compared with previous estimates. (10/21, #14)
- A Japanese industrial company aims to test a new **tidal power system** at an energy center in the north of Scotland. (10/21, #20)
- **India and Russia** signed deals to work closer with the IEA on energy matters. The International Energy Agency sponsored a meeting in Paris that focuses on energy security and sustainability, as well as closer engagement with non-member states. (10/20, #5)
- **Eni** has made a very large natural-gas discovery off the coast of Mozambique, big enough that it could turn the East African country into a major exporter of gas to Asia. (10/20, #11)
- China's largest **rare earths** producer is suspending production for a month in a move to force prices up. (10/18, #17) (10/20, #13)
- The **Gas Exporting Countries** Forum won't become a cartel like OPEC because it won't impose production quotas on its members, said Russia's Deputy Energy Minister Anatoly Yanovsky. (10/19, 6)
- Russian Prime Minister Putin has told his Japanese counterpart Yoshihiko Noda that Moscow hopes to advance **energy cooperation** with Tokyo in areas including LNG and possible electricity supplies to the gas- and power- hungry nation. (10/17, #16)
- **Japan** is considering revising plans to cut carbon dioxide emissions by 25 percent by 2020 due to a rethink of its energy future. The country is worried that it is spending too much on carbon credit programs. (10/19, #12)
- The **EU** is for the first time clearly questioning whether it should press ahead with long-term plans to cut greenhouse-gas emissions if other countries don't follow suit. This could herald a significant policy shift for a region that has been at the forefront of advocating action to combat climate change. (10/19, #17)

- A bill passed by the US Senate ensures the American public isn't in danger of **gas pipelines** "exploding under their feet," a California lawmaker said. (10/19, #14)
- US officials are trying to make sure the American coastline will be protected as **Cuba** begins drilling a deep water oil well later this year about 60 miles off the Florida Keys. (10/17, #8)
- **China's** hydropower output dropped 24.5 percent year-on-year to 56.87 billion kilowatt-hours (kwh) in September as a result of decreased runoff from major rivers. (10/17, #9)
- **BP** reached a $4 billion out-of-court settlement with Anadarko Petroleum Corp. to settle claims related to the deadly explosion and oil spill at a U.S. offshore drilling platform. (10/17, #13)
- Kinder Morgan Inc.'s agreement to buy El Paso Corp. (EP) for $21.1 billion, the energy industry's biggest transaction in more than a year, would create the largest natural-gas **pipeline network** in the U.S. (10/17, #15)

Commentary: Oil and the Economy

By Chris Martenson

(Note: Commentaries do not necessarily represent the position of ASPO-USA.)

By itself, the concept of having to get by on just a little bit less oil each year seems to be manageable enough. Some think that a steadily, or even sharply, rising price will merely reduce demand and promote exploration and that everything will more or less normally work itself out through well understood market mechanisms. Perhaps it will, but I think the odds are stacked against a smooth transition to a future of less net energy.

The critical fact is this: Because all money is loaned into existence, our economy requires perpetual growth to function. The purpose of this article is not to opine on whether this is a good or a bad system, but merely to describe it and the risks it carries by virtue of its design.

With constant economic growth, our money system is relatively happy; without growth, it becomes utterly despondent. Without constant economic growth, preferably in the range of 3% (or more!), the collective pile of debts cannot be serviced out of new growth and so they begin to default.

This is exactly the dynamic that has been exposed and now is in play in Europe and, if my guesses are correct, will soon visit the very core of the thin-air money machine, the US itself.

That's the difference between growth and shrinkage in our world economy. Night and day. Life and death. If this strikes you as a rather fragile and unsustainable way to construct an economy, then you are not alone. After all, how can anything grow forever?

The key takeaway here is this: Our economy must grow in order to function.

Oil & the Economy

When I have the opportunity to present to and interact with people who are one the economic/financial side of the equation, they very rarely understand - truly understand - the energy side of the equation. You know, the not-so-subtle difference between total energy and net energy, and the fact that the first and second laws of thermodynamics have never been broken.

And in reverse, I often find that people in the energy camp do not really appreciate how the economy functions, and that it is really a complex system with multiple nested feedback loops predicated upon growth. In my view, each camp would benefit from spending a little bit more time in the other camp because both are really making some very profound assumptions.

The economic folks are assuming that energy will somehow be found and brought to market and the energy folks are assuming that the economy will be there to support their capital and technology-intensive efforts. Neither of these assumptions are very helpful if they help us overlook the potential disruption that declining net energy could unleash within our economy.

To return to the idea of our economy as a complex system for a minute. The field of complexity research is pretty robust and understands the basic principles of the coupling between energy flows and complexity. Whether the complex system being studied is a wave encountering the shore, a pile of sand, or an economy; the same fundamental rules seem to apply. Maintaining complexity requires energy while increasing complexity requires more energy.

At this point I have to confess that my earlier description of the economy was woefully narrow. Yes, it is a nested system with multiple feedback loops, but those in turn are interconnected with political, social and cultural systems, each of which are themselves complex systems. It is in the largest sense that we must consider the impact of declining net energy on the complexity and behaviors of our most critical systems.

To make things even more uncertain, another feature of complex systems is that they are inherently unpredictable. When an event might occur, or how big that event might be, are both unknowable, whether it is the size and timing next earthquake on an overdue fault or the vigor and demands of the social uprising we are talking about. Complex systems are frequently tightly coupled and little events cascade and become larger events; the so-called butterfly effect.

My view here is that a decline in net energy will disrupt the economy, and other interlocking systems, in ways that are both unknowable and larger than expected by most.

Six Inches Thick

Recently there was a revealing AP story about coal seams in Kentucky being chased that were only six inches thick. Revealing because it tells us a lot about where we are in the net energy story.

Those managing pensions with 30 year investment horizons should be thinking really hard about those six inch coal seams. They should ponder what it means that half of all the oil ever burned has been burned over the past 22 years and wonder about where the supplies will come from to fund the next 22 years.

In fact all of us should; what we assume to be the way the world works, and the way all of those interlocking complex systems function, is a very, very recent development historically speaking and can continue if, *and **only** if*, the amount of available surplus energy continues to grow.

This is not an idle concern, but one that will shape our futures by shaking our monetary and economic systems to the core. Such is the nature of complex systems starved of the requisite amount of energy required to both maintain and advance the current level of complexity.



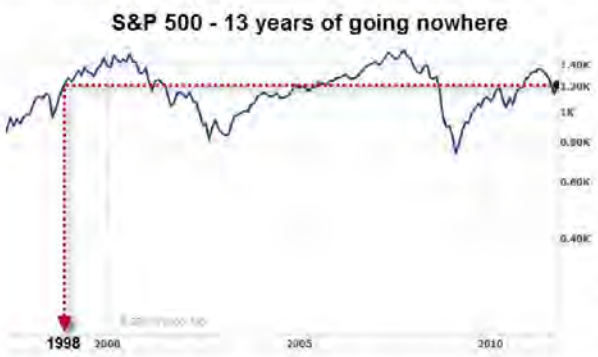
The implications for stocks, bonds, and every other growth-dependent investment class are enormous. In aggregate they will fall in value. Whether dollars, euros or yen are depreciated or inflated in value does not matter, either way stocks and bonds will be worth less than they currently are because the growth premium will be reduced or eliminated.

(Source - http://www.multpl.com/s-p-500-dividend-yield/)

To make things just a little bit darker for equities today is the fact that from a historical perspective dividend yields are quite unattractive and reversion to the mean is the better bet:

Historically, truly compelling equity yields are in the vicinity of 10% but even the long term average is more than double the current yield. The two ways to bring the dividend yield back into the historical fold are for prices to fall by half or dividends to be doubled.

Unless a massive earnings binge is expected, which rising energy costs render difficult if not impossible, the 'fall by half' option is the more likely outcome. How could equities fall by half? One way would be to keep the dollar constant and let the prices fall. This is the more obvious method. The other way is to debase the currency and let the purchasing power of stocks erode by half while holding their nominal prices constant. If that sounds tricky, it is exactly what has happened over the prior thirteen years where the S&P is now trading at the exact same level it was back then. Inflation has been anything but absent over that same period and this is how printing money in the face of declining net energy (and an enormous credit bubble popping) will deliver to us smaller returns even as the tried and formerly true monetary levers are pulled and pulled again in search of a response we can recognize.



The bottom line here is that everything we think we know about investing and how the world works is challenged by the pesky reality of energy sources that are dwindling in both quantity and quality. The days of pulling magic monetary and fiscal levers and then having the resources magically appear are over. A new and more complex future has arrived.

Unfortunately the experience set of practically everyone currently with their hands on these levers does not extend to energy, physics, the laws of thermodynamics, or anything outside of the tidy but woefully incomplete world of economics.

Our job, then, is to assess for ourselves what the nature, duration, and size of the economic disruptions might be that result from steadily squeezing the available amount of net energy that all these complex systems are supported by.

Whatever the answer each person or entity arrives at, whether that is "there's nothing to worry about," or something dire, is perfectly fine as long as a comprehensive, data rich conversation and/or debate is held. The time for holding assumptions and beliefs is over. It is time to broaden our views, wander into the neighboring camps, and see what we can learn from each other.

Chris Martenson (@chrismartenson) speaks twice at the 2011 ASPO-USA Conference. First, Thursday Nov. 3 at the Congressional Auditorium inside the U.S. Capitol. Then later that afternoon in a session titled "Of Wells and Wall Street." Dr. Martenson is the author of a "The Crash Course: The Unsustainable Future of Our Economy, Energy and Environment" published by Wiley and now available in bookstores. His website, Chrismartenson.com, reaches a wide and growing audience of individuals interested in how to navigate the coming times with an eye towards preserving capital and mitigating risks.

The Olduvai Theory

Energy, Population, and Industrial Civilization

by Richard C. Duncan

Abstract

The Olduvai Theory states that the life expectancy of industrial civilization is approximately 100 years: circa 1930-2030. Energy production per capita *(e)* defines it. The exponential growth of world energy production ended in 1970 (Postulate 1 is verified). Average *e* will show no growth from 1979 through circa 2008 (Postulate 2 is confirmed from 1979 through 2003). The rate of change of *e* will go steeply negative circa 2008 (Postulate 3). World population will decline to about two billion circa 2050 (Postulate 4). A growing number of independent studies concur (see text).

[Key Words*: Olduvai Theory; Henry Adams; energy and population; exponential growth; permanent blackouts; overshoot and collapse.*]

Introduction

The Olduvai Theory states that the life expectancy of industrial civilization is approximately 100 years: circa 1930-2030. It is defined by the ratio of world energy production and population *(e)*. Four postulates follow:

1. The exponential growth of world energy production ended in 1970.
2. Average *e* will show no growth from 1979 to circa 2008.
3. The rate of change of *e* will go steeply negative circa 2008.
4. World population will decline proximate with *e*.

Richard C. Duncan, Ph.D., *an electrical engineer, is Director of the Institute on Energy and Man and a frequent writer on the topic of "peak oil." He can be reached at the Institute: 1526 44th Avenue SW, Suite 204, Seattle, WA 98116; duncanrichardc@msn.com.*

This paper accomplishes four goals:

The first goal is to show that from 1893 through 1949 three distinguished scholars formulated a comprehensive Olduvai scenario.

The second goal is threefold: 1) electrical power is crucial end-use energy for industrial civilization;[1] 2) the big blackouts are inevitable; and 3) the proximate cause of the collapse of industrial civilization, if and when it occurs, will be that the electric power grids go down and never come back up.

I first presented the Olduvai Theory at an engineering conference entitled, "Science, Technology, and Society" (Duncan, 1989). My paper was well received and a lengthy discussion followed — even though I had no data to support it at the time. A few years later I had gathered eight (8) historical data points to backup the theory (Duncan, 1993). Three years after that I showed that it held up against the world energy and population data from 1950 to 1995 (Duncan, 1996). Next tested in 2000, the theory was supported by data from 1920 to 1999 (Duncan, 2000, 2001). The third goal of this paper is to extend this series of tests by using data from 1850 through 2003.

The fourth goal is twofold: 1) detail and describe the Olduvai Theory from 1930 to 2030, and 2) document that a growing number of studies concur with Postulate 4.

Three Scouts

> *There is no comprehensive substitute for oil in its high-energy density, ease of handling, myriad end-uses, and in the volumes in which we now use it. The peak of world oil production and then its irreversible decline will be a turning point in Earth history with worldwide impact beyond anything previously seen. And that event will surely occur within the lifetimes of most people living today.* (Youngquist, 2004)

An Olduvai scenario of industrial society was envisioned by historian Henry Adams in 1893, quantified by architect Frederick Ackerman in 1932, and graphed by geophysicist King Hubbert in 1949. A summary follows.

HENRY ADAMS, Historian (1838-1918) – great grandson of the second President and grandson of the sixth: I first became aware of Henry Adams' work in 2002 while reading David E. Nye's masterpiece *Electrifying America.*

Henry Adams defined energy broadly to include not only steam engines or electricity but also any force capable of organizing and directing people.

> *Adams concluded that electrification was part of a larger process of historical acceleration, which would lead to an inevitable social decline. … It seemed probable that the ultimate result of exploiting new energy systems would be the apocalyptic end of history itself.* (Nye, 1990, p. 142-3)

Adams' goal was to discover a succinct law of history as outlined in his book *The Education of Henry Adams* (Adams, 1907). It was at the Chicago World's Fair in 1893 where he first theorized that "forces totally new" – especially electric power and incandescent lighting – would "accelerate society into chaos and ruin."

> *The new American – the child of incalculable coal-power, chemical power, electric power, and radiating energy, as well as of new forces yet undetermined – must be a sort of god compared with any former creation of nature. … The new forces would educate. … The law of acceleration was definite … No scheme could be suggested to the new American, and no fault needed to be found, or complaint made; but the next great influx of new forces seemed near at hand, and its style of education promised to be violently coercive.* (Adams, 1907, Chap. 34)

Ernest Samuels (1973) edited Adams' book and forcefully summed it up.

> *Even in his own day he saw the eighteenth century American dream of unlimited opportunity and indefinite progress turning into a waking nightmare of the moral dilemmas of a capitalist society. He saw too that though science was indeed making tremendous advances in the conquest of Nature, winning every battle in that age-old contest, the odds were growing that a dehumanized mankind might lose the war.* (p. vii)

Henry Adams' farsightedness was and is amazing. He is buried in Rock Creek Cemetery in Washington, DC and his ideas are now resonating worldwide – but not yet in the U.S. capital.

FREDERICK LEE ACKERMAN, Architect (1878-1950): In 1919, Ackerman was a founding member of the Technical Alliance (later Technocracy Inc.). The group consisted of a broad spectrum of eminent professionals. In 1932 Ackerman published his seminal paper "The Technologist Looks at the Depression" wherein he – like Henry Adams before – observed that new energies were accelerating social change.

From about 4000 B.C.E. to 1750 C.E., Ackerman noted, the common welfare was limited to the work that man could do with his hands and a few crude tools.

Whence the Name 'Olduvai'?

Olduvai Gorge is an archaeological site in the eastern Serengeti Plains in northern Tanzania. The gorge is a very steep-sided ravine roughly 30 miles long and 295 ft. deep. Exposed deposits show rich fossil fauna, many hominid remains and items belonging to one of the oldest stone tool technologies, called Olduwan. The objects recovered date from 2,100,000 to 15,000 years ago.

The name of this premier site for studying the Stone Age has been taken to label the theory that industrial civilization will soon collapse and send humankind into precipitous decline.

Olduvai Gorge is best known as the site where, in 1959, the discoveries of Mary and Louis Leakey changed paleontology to focus on Africa, rather than Asia, as the region of human origins.

The Oxford Dictionary of Scientists (Oxford University Press, 1999) states: "Leakey's work has not only provided evidence for the greater age of humans but suggests that Africa, and not as was previously thought, Asia, may have been the original center of human evolution."

Social change, he concluded, involves a change in the techniques whereby people live.

> *We shall define as a "social steady state" any society in which the quantity [of energy expended] per capita ... shows no appreciable change as a function of time. ... On the other hand a society wherein ... the average quantity of energy expended per capita undergoes appreciable change as a function of time is said to exhibit "social change." ... Upon this basis we can measure quantitatively the physical status of any given social system. ... The energy per capita [equals the] the total amount [of energy] expended divided by the population.* (Ackerman, 1932, p. 18-19)

Ackerman's Law is expressed by the ratio: e = Energy/Population.

It is important to acknowledge that in 1943 anthropologist Leslie A. White independently discovered what is now properly designated Ackerman's Law.[2]

M. KING HUBBERT, Geophysicist (1903-1989): In 1949 King Hubbert noted that world energy consumption per capita, e, after historically rising very gradually from about 2,000 to 10,000 kilogram calories per day, then increased to a much higher level in the 19th century. Further, he believed it possible for global society to maintain a high level of e indefinitely (later he labeled this "Course I"). But he also realized that society could permanently collapse back to "the agrarian level of existence" (later he labeled this "Course III").

Hubbert published sketches of Course III (overshoot and collapse) many times after 1949. And, although he kept the general shape of the curves the same, he successively decreased his estimate of when the peak of e would occur. Namely: In his original paper he put the peak of e in 2400 C.E. (Hubbert, 1949); in his next version he put the peak in 2360 C.E. (Hubbert, 1962); and in his final version he put the peak in 2150 C.E. (Hubbert, 1976). Thus between 1949 and 1976 Hubbert's "most dismal Course III" became successively bleaker by some 250 years.

The historical data through 2003 (shown later as curve 2, Figure 2) now rules out Hubbert's most optimistic Course I. This leaves global society with only two feasible futures: Course II (an orderly decline of e to a medium steady state) and Course III (collapse to the agrarian level of existence).

Linking the "scouts" together: Henry Adams in about 1915 gave the copyright to his book *Mont-San-Michele and Chartres* to the American Institute of Architects whereon they published it. At that time Frederick Ackerman was a distinguished member of the Institute. Further, both Frederick Ackerman and King Hubbert were close friends and prominent members of Technocracy Inc. Thus the intellectual chain linking Adams to Ackerman to Hubbert is complete.

Electromagnetic Civilization

> *For systems theorists the first message of their eerily smooth distribution curves is clear: big blackouts are a natural product of the power grid. The culprits that get blamed for each blackout – lax tree trimming, operators who make bad decisions – are actors in a bigger drama, their failings mere triggers for disasters that in some strange ways are predestined. In this systems-level view, massive blackouts are just as inevitable as the mega quake that will one day level much of Tokyo.* (Fairley, 2004)

This section stresses that 1) affordable electric power is crucial for modern living (all agree); 2) big blackouts are inevitable (power system engineers agree); 3) permanent blackouts are coming ("unthinkable").

1) King Kilowatt

Electricity is the most versatile and convenient end-use energy ever put to use by humanity. But one catch is that electricity is "everywhere and nowhere." Think of all the energized switches, outlets, and wires in an "empty" room plus the electromagnetic waves that pervade it at the speed of light (AM, FM, TV, cell phone, etc.). Then there is the vastly greater expanse of man-made electromagnetic energy that envelops the planet and radiates out into the Galaxy.[3]

Every power plant generates electromagnetic waves. From there they follow countless miles of high-voltage wave guides (commonly called "wires" or "lines") at near the speed of light to numerous customer loads: heaters, motors, telephones, lights, antennas, radios, televisions, fiber-optic systems, the

Internet, etc. We constantly "swim" through this sea of electromagnetic energy just as fishes swim through water. And, like water to fishes, this ethereal energy is vital to modern civilization.

By tallying the amount of primary energy used to generate electric power we find that electricity wins hands down as our most important end-use energy. To wit: I estimate that 7% of the world's oil is consumed by the electric power sector, 20% of the world's natural gas, 88% of the coal, and 100% each for nuclear and hydroelectric power. The result is that electric power accounts for 43% of the world's end-use energy compared to oil's 35%.

The critical role that electricity plays in the United States is likewise telling. Out of the total end-use energy consumed in each of the social sectors in 2003:

1) 0.2% was electricity in the Transportation sector,
2) 33.3% in the Industrial sector,
3) 65.9% in the Residential sector, and
4) 76.2% in the Commercial sector (EIA, 2004).

2) Big Blackouts Are Inevitable

The second catch is that electricity is generated, transmitted, and distributed by a complex, far-flung, costly, and fragile infrastructure.

The electric power networks are the largest, most complex machines ever constructed. They have been built, rebuilt, and interconnected over many decades with a baffling variety of hardware, software, standards, and regulations. The ravenous input nodes must be continuously fed with immense amounts of primary energy and then the output nodes deliver electromagnetic energy to myriad customer loads.

Between the input and output nodes are power plants, substations, and transmission and distribution lines and towers.

Inevitably the old equipment wears out or becomes obsolete so highly educated and skilled personnel are needed to maintain the grids.

Then there are power control centers that monitor and manage the generation, transmission, and distribution of electric power over local, regional, and super-regional areas. Each control center has numerous computers, databases, and special software to monitor and control the flow of power. Thoroughly trained and dedicated operators are essential to keep the grids going 24/7/365.

Much faster response times are provided by "protective relays" that instantly trip for abnormal conditions, such as short circuits on high-voltage power lines.

Thus, except for lightning strikes and tornadoes, it might seem that the power networks would always operate reliably, thus completely avoiding big blackouts.

But that is false. Power control specialists J. Apt and L. B. Lave (2004) have warned:

> *Data for the last four decades show that blackouts occur more frequently than theory predicts, and they suggest that it will become increasing expensive to prevent these low-probability, high-consequence events. The various proposed "fixes" are expensive and could even be counterproductive, causing future failures because of some unanticipated interaction.*

3) Permanent Blackouts Are Coming

The third catch, according to the Olduvai Theory, is that sooner or later the power grids will go down and never come back up.[4] The reasons are many.

The International Energy Agency (IEA, 2004) estimates that the cumulative worldwide energy investment funds required from 2003 to 2030 would be about $15.32 trillion (T, US 2000 $) allocated as follows:

1. Coal: $0.29T (1.9% of the total),
2. Oil: $2.69T (17.6%),
3. Gas: $2.69T (17.6%),
4. Electricity: $9.66T (63.1%).

Thus the IEA projects that the worldwide investment funds essential for electricity will be 3.7 times the amount needed for oil alone, and much greater than all of that required for oil, gas, and coal combined.

The OT says that the already debt-ridden nations, cities, and corporations will not be able to raise the $15.32 trillion in investment funds required by 2030 for world energy. (Not to mention the vastly greater investment funds required for agriculture, roads, streets, schools, railroads, water resources, sewer systems, and so forth.)

Furthermore, because of the rapidly rising cost of

electricity, the increasingly impoverished customers won't be able to pay their electric bills. Worse yet, the really desperate ones will illegally wire directly to the low-voltage power lines, so without a wattmeter to record their usage they won't even have any bills to pay.

We will return to this pivotal topic later, but first I will use the most recent data now available to test OT Postulates 1 and 2.

World Energy and Population: the Basis

During the last two centuries we have known nothing but exponential growth and in parallel we have evolved what amounts to an exponential-growth culture, a culture so heavily dependent upon the continuance of exponential growth for its stability that it is incapable of reckoning with problems of no growth. (M. King Hubbert, 1976, p. 84)

The Olduvai Theory is based on time-series data of world energy production and population; all data are freely available on the Internet. The data are arrays of discrete numbers year-on-year, not continuous functions of time. Hence the difference calculus must be used, not the infinitesimal calculus. Postulates 1 and 2 require that we distinguish intervals of linear growth from those of exponential growth.[5, 6]

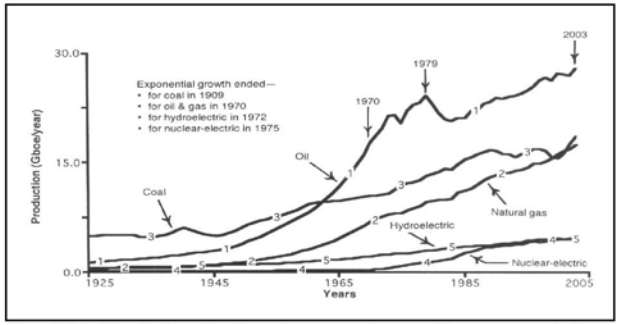


Figure 1. World production of the five major sources of energy. All curves are scaled in 'billion barrels of oil equivalent' (Gboe). Data sources: Romer (1985) for 1850-1964; British Petroleum (2004) for 1965-2003.

Five Major Sources of Energy

Our energy database for testing the OT ranges from 1850 through 2003 (Romer, 1985; British Petroleum, 2004). However it is more effective to focus on the years from 1925 through 2003 for world oil, natural gas, coal, nuclear, and hydroelectric energy production – Figure 1.[7]

Commercial oil production was underway before 1833 in the Chechen Republic (using shovel-dug wells; Iastratov, 2004). Hence, if we assume that it began in 1833 and grew exponentially up to 1850, then world oil production grew exponentially at an average of 8.8%/y during the 137-year interval from 1833 to 1970. After that production slowed to various linear rates of growth and decline from 1970 to 2003 (curve 1).

World natural gas production began in about 1880 and grew exponentially at 6.8%/y during the 90-year interval from 1880 to 1970. Thereafter it grew at a 2.7%/y linear rate from 1970 to 2003 (curve 2).

Coal was burned for cooking and space heating ever since the 12th Century, but it was not used for mechanical work until about 1700 (Savery's steam engine). Thus if we assume that it began in 1700 and grew exponentially up to 1850, then coal production grew exponentially at about 4.3%/y during the 209-year interval from 1700 to 1909. This was followed by several intervals of linear growth and decline from 1909 to 2003 (curve 3).

Nuclear-electric energy production began in 1955 (in Britain) and grew exponentially at 29.7%/y from 1955 to 1975. This was succeeded by three intervals of linear growth and decline from 1975 to 2003 (curve 4).

Hydroelectric energy production began in about 1890 (at Niagara Falls, USA) and grew exponentially at 15.4%/y from 1890 to 1912, followed by exponential growth at 3.6%/y from 1912 to 1972. Next came linear growth from 1972 to 2000 and decline from 2000 to 2003 (curve 5).

Testing Postulate 1 is facilitated by ranking the five sources of energy production by the duration of their intervals of exponential growth:

1. Coal grew exponentially for 209 years: 1700-1909.

2. Oil grew exponentially for 137 years: 1833-1970.

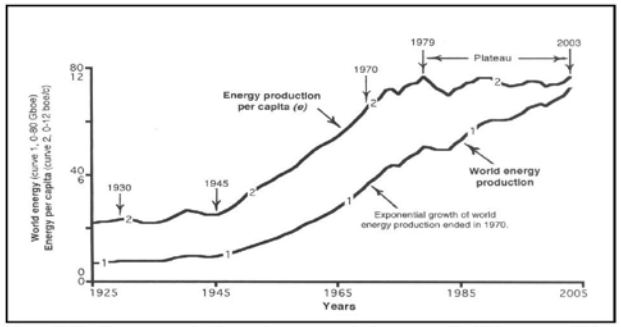


Figure 2. World energy production and energy production per capita. Data sources: 1) for energy – Romer (1985) for 1850-1964 and British Petroleum (2004) for 1965-2003; 2) for population – UN (2004) for 1850-1949 and USCB (2004) for 1950-2003.

3. Natural gas grew exponentially for 90 years: 1880-1970.

4. Hydroelectric energy grew exponentially for 82 years: 1890-1972.

5. Nuclear-electric energy grew exponentially for 20 years: 1955-1975.

Note well that none of the five sources of primary energy production grew exponentially after 1975. *Postulate 1 is partly verified (continued below).*

Q: So is exponential growth passé on this planet? My response: There is, I recognize, the possibility that world coal and/or nuclear-electric energy production could grow exponentially for very brief periods in the future, but that option does not exist for oil, natural gas, or hydroelectric energy production.

World Total Energy Production and Energy Production per Capita

By combining world oil, natural gas, coal, nuclear, and hydroelectric energy production (discussed above), we get the world total energy production. The portion from 1925 through 2003 is shown by curve 1, Figure 2.

World total energy production grew exponentially at about 4.6%/y from 1700 to 1909. Next it grew linearly at 2.2%/y from 1909 to 1930 and 1.5%/y from 1930 to 1945. Subsequently it surged exponentially at 5.5%/y from 1945 to 1970. This was followed by linear growth at 3.5%/y from 1970 to 1979. Thereafter world total energy production slowed to linear growth of about 1.5%/y from 1979 to 2003. *Postulate 1 is verified.*

World population is the essential other half of the energy-population matrix, but it is omitted from Figure 2 to avoid clutter. Described in numbers: World population grew linearly at an average of 0.5%/y from 1850 to 1909; 0.8%/y from 1909 to 1930; 1.0%/y from 1930 to 1945; 1.7%/y from 1945 to 1970; 1.8%/y from 1970 to 1979; and 1.5%/y from 1979 to 2003 (UN, 2004; USCB, 2004).

Comparing the foregoing numbers: World total energy production easily outpaced world population growth from 1700 to 1979, but then from 1979 through 2003 total energy production and population growth went dead even at 1.5%/y each.

World total energy production per capita, *e,* grew exponentially at 3.9%/y from 1700 to 1909. Thereafter it grew at linear rates of 1.4%/y from 1909 to 1930; 0.5%/y from 1930 to 1945; 3.7%/y from 1945 to 1970; 1.7%/y from 1970 to 1979; and 0.0%/y (i.e., zero net growth, called the 'Plateau') from 1979 to 2003 – curve 2, Figure 2.

Observe in Figure 2 that average *e* did not grow at all from 1979 to 2003. *Postulate 2 is confirmed from 1979 to 2003.*

The Olduvai Theory

Many industrialized nations are now growing rapidly and placing ever-greater demands on world resources. Many of those resources come from the presently underdeveloped countries. What will happen when the resource-supplying countries begin to withhold resources because they foresee the day when their own demand will require the available supplies? Will the developed nations stand by and let their economies decline while resources still exist in other parts of the world? Will a new era of international conflict grow out of pressures from resource shortage? (Forrester, 1971, p. 70)

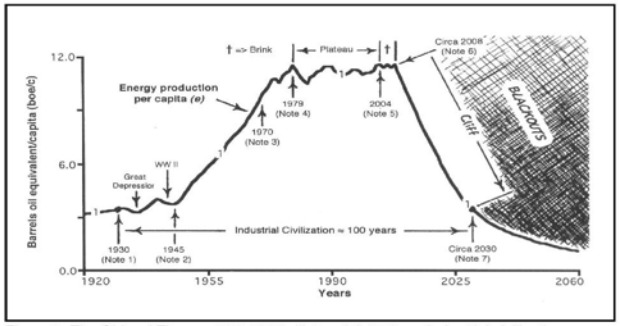


Figure 3. The Olduvai Theory: 1930-2030. Notes: (1) 1930 => Industrial civilization begins; (2) 1945 => Very strong growth begins; (3) 1970 => Growth begins to slow; (4) 1979 => The no-growth "Plateau" begins; (5) 2004 => The "Brink" begins; (6) Circa 2008 => The "Cliff" begins; and (7) Circa 2030 => Industrial civilization ends. Data sources: 1) for energy – Romer (1985) for 1850-1964, British Petroleum (2004) for 1965-2003, and Duncan (this paper) for 2004-2060; 2) for population—UN (2004) for 1850-1949, USCB (2004) for 1950-2004, and Duncan (this paper) for 2005-2060.

The Olduvai Theory states that the life expectancy of industrial civilization is approximately 100 years: circa 1930-2030. Ackerman's ("White's") Law defines it: e = *Energy/Population*. The duration of industrial civilization is measured by the time in years from when e reaches 30% of its maximum value to the time when e falls back to that value. The OT is illustrated in Figure 3.

Seven events: The 1st event in 1930 (Note 1, Figure 3) marks the beginning of industrial civilization where e first reached 30% of its maximum value. The 2nd event in 1945 (Note 2) marks the beginning of very fast growth. The 3rd event in 1970 (Note 3) marks the beginning of slower growth. The 4th event in 1979 (Note 4) marks the start of a rough *Plateau* of no growth. The 5th event in 2004 (Note 5) marks the beginning of the *Brink*. The 6th event circa 2008 (2006-2012, Note 6) marks the edge of the *Cliff* where e begins a precipitous decline. The 7th event circa 2030 (Note 7) is the "lagging 30% point" when e falls back to 30% of its maximum value. This puts the duration of industrial civilization at approximately 100 years.

Seven intervals: 1) From 1930 to 1945 e shows irregular growth during the Great Depression and World War II.[8] 2) The strong growth from 1945 to 1970 correlates with the strong growth in world oil and natural gas production. 3) The slowing growth of e from 1970 to 1979 reflects slackening oil production. 4) The rugged *Plateau* from 1979 to 2003 shows that energy production ran neck-in-neck with population growth. 5) The *Brink* from 2004 to circa 2008 represents the energy industry's struggle to keep up with rising demand. 6) The *Olduvai Cliff* from circa 2008 to 2030 correlates with a spreading epidemic of permanent blackouts. 7) From 2030 onward society approaches the agrarian level of existence.

The most reliable leading indicator of the OT Cliff event, if and when it happens, will be brownouts and rolling blackouts.

World Population Scenarios

The resource wars will run their courses, and populations will crash. The journey back to 'natural' levels of world population will not be a joyous one. Have policy-makers begun to grasp the scale of the problem that confronts

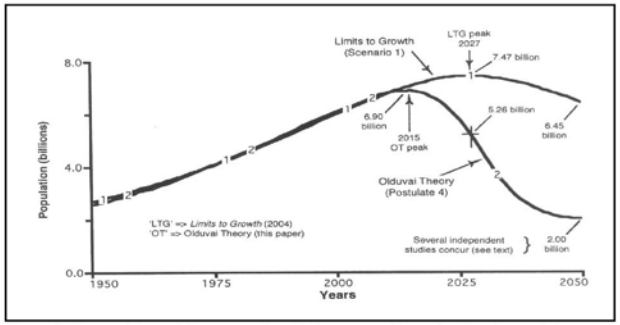


Figure 4. Two world population scenarios. Data sources: Curve 1—Meadows et al. (2004); Curve 2 – USCB (2004) for 1950-2004, and Duncan (this paper) for 2005-2050.

them? Are they still dazzled by the contention that rates of increase are slowing, not grasping that all the time the numbers are mounting up? (Stanton, 2003)

Two scenarios of world population are illustrated in Figure 4.[9] The first is based on a system dynamics model that was recently updated and tested with many alternative policies.[10] The second is based on some of my previous studies including nine forecasts of world oil production. Details follow.

1. Limits to Growth: The 30-Year Update (2004)

In 1970 The Club of Rome sponsored Phase One of the "Project on the Predicament of Mankind." Dr. Dennis Meadows of MIT directed a team of 17 scholars that worked for two years to complete it. "The study examined the five basic factors that determine, and therefore, ultimately limit, growth on this planet – population, agricultural production, natural resources, industrial production, and pollution."

Phase One of the study was published in *The Limits to Growth* (Meadows et al., 1972). That study was updated and published in *Beyond the Limits* (Meadows et al., 1992). In turn, the 1992 study was updated in 2002 and published in *Limits to Growth: The 30-Year Update* (Meadows et al., 2004).

The 30-year update is coded in 241 system dynamics equations. The main output of the model depicts 10 scenarios, and the key variables for each are plotted out over time. Depending on the assumptions, the LTG model can produce many different scenarios ranging from the deep impoverishment of society to a high level of human welfare extending far into the future.

Meadows et al. (2004) describe their reference scenario:

> *The world society proceeds in a traditional manner without any major deviation from the policies pursued during most of the twentieth century. Population and production increase until growth is halted by increasingly inaccessible nonrenewable resources. Ever more investment is required to maintain resource flows. Finally, lack of investment funds in the other sectors of the economy leads to declining output of both industrial goods and services. As they fall, food and health services are reduced, decreasing life expectancy and raising average death rates.* (p. 168-69; emphasis added)

The peak of world population in the LTG scenario occurs in 2027 at 7.47 billion people – curve 1, Figure 4. Note well that the "lack of investment funds" is cited as one of the primary causes of collapse.

Bottom line: The tone of *Limits to Growth: The 30-Year Update* is cautiously optimistic. The authors maintained in 2002 that there was still time for the world to achieve sustainability, but the course of society would have to be quickly changed. However by 2022 it will be too late. The 20-year delay in moving toward sustainability sends the world "on a turbulent, and ultimately unsuccessful path. Policies that were once adequate are no longer sufficient."

2. The Olduvai Theory and World Population

> *[As a result of permanent blackouts of electric power] the industries of all civilized countries would stop working, so that, with millions unemployed and with a total cut in the production of goods,*

> *unprecedented and incurable misery would occur, killing perhaps three-quarters of the population, and leaving the rest in a deplorable state.* (Thirring, 1956, p. 135)

The data for testing OT Postulate 3 are not available at this writing. For the sake of discussion, however, I reserve Postulate 3 for later, and show that Postulate 4 (the Olduvai scenario for world population) is consistent with a growing number of autonomous studies.

The peak of world population in the OT scenario occurs in 2015 at 6.90 billion – curve 2, Figure 4. Notice that the OT scenario closely matches the LTG scenario up to 2012. Thereafter, however, the OT scenario diverges downward. Thus when the LTG scenario peaks in 2027 at 7.47 billion, the population in the Olduvai scenario has declined to 5.26 billion – the same value it had in 1990.

The differences increase over time. Namely: When the LTG scenario shows the world population at 6.45 billion in 2050, population in the OT scenario has fallen to 2.00 billion – the same value it had in 1925.

The differences between the LTG scenario and the OT scenario, I reason, occur mainly because the *Limits to Growth* model does not explicitly include world energy production, whereas the Olduvai Theory does (Duncan, 1989, 1993, 1996, 2000, 2001, 2003, 2004; Duncan & Youngquist, 1999).

Moreover, the Olduvai Theory specifies that permanent blackouts – each happening one-by-one, region-by-region, and spreading worldwide over time – will be the *proximate (direct, immediate)* cause of the collapse of industrial civilization. In contrast, the *Limits to Growth* model identifies many *ultimate (indirect, delayed)* causes of the collapse – especially the "lack of investment funds for industrial goods and services." Hence the LTG and OT scenarios are consistent and complementary.

The Olduvai scenario was neither first nor is it unique in projecting that world population could quickly decline to its pre-industrial level. Five examples follow.

In 1949 King Hubbert realized that the human population could collapse back to "the agrarian level of existence" ("Scenario III", discussed previously).

Austrian physicist Hans Thirring (1956) was, as far as I can tell, the first to recognize that the rapidly growing world population was increasingly vulnerable to the loss of electric power. His scenario (quoted above) suggests that permanent blackouts might kill "perhaps three-quarters of the [world's] population." Thus the widespread loss of electric power might cause the OT peak population of 6.90 billion in 2015 to fall to 1.73 billion in 2050.

According to Professor David Pimentel of Cornell University the world will have to adjust to lesser supplies of energy and food by a commensurate decrease in population. D. Pimentel and M. Pimentel (1996) state, "…the nations of the world must develop a plan to reduce the global population from near 6 billion to about 2 billion. If humans do not control their numbers, nature will."

Professor Richard Heinberg of the New College of California anticipates that oil and gas depletion will send prices of these fuels – along with the hydrocarbon-dependent fertilizers, pesticides, and herbicides – soaring. Hence without cheap energy, industrial agriculture will be able to feed only a fraction of the people it does now – perhaps less than two billion, roughly its pre-industrial level (reported by J. Attarian, 2003).

After reviewing an early draft of this paper, geologist Walter Youngquist (2004) wrote, "I doubt if population will be reduced to 2 billion or less by 2030 – you might want to modify that as the Third World will still have a lot living on a subsistence basis. I would move the 2 billion or so ultimate figure to year 2050 perhaps. By the way, the 2 billion is what others say is probably the limit in terms of a renewable natural resource economy – and the living is not likely to be as high as it is now."

To extend our survey, four widely circulated scenarios to 2050 tend to put the world population far above those mentioned above. Specifically, the US Census Bureau puts the world population in 2050 at 9.2 billion (USCB, 2004). In addition, the United Nations offers three population scenarios for 2050:10.6 billion [high], 8.9 billion [medium], and 7.4 [low] (UN, 2004).

All population scenarios – we point up – are speculation. Only time will tell.

History gives no precedent for the collapse of industrial (electromagnetic) civilization, but the consequences of the policy of exponential brinkmanship are clear (White, 1943; Thirring, 1956;

Youngquist, 1997, 1999; Stanton, 2003; and Bartlett et al., 2004).

The overshoot and collapse of industrial civilization was assured once humanity became dependent on the rapid exploitation of nonrenewable resources on a finite planet. Moreover our insatiable appetite for electric power has accelerated the collapse and steepened the decline (Adams, 1907; Duncan, 2000, 2001).

The Olduvai Theory is extensively discussed on the worldwide web – pro, con, and more. Search for "olduvai theory" to access the various sites and forums.

Conclusions

The Olduvai Theory states that the life expectancy of industrial civilization is approximately 100 years: circa 1930-2030. Ackerman's ("White's") Law defines it: $e = Energy/Population$. Four postulates follow:

1. The exponential growth of world energy production ended in 1970.

2. Average *e* will show no growth from 1979 to circa 2008.

3. The rate of change of *e* will go steeply negative circa 2008.

4. World population will decline proximate with *e*.

Henry Adams in 1893 envisioned that electric power would accelerate society into chaos and ruin. Frederick Ackerman in 1932 showed that social change could be quantified by *e*. King Hubbert graphed the shape of the *e* curve in 1949. Thus an Olduvai scenario existed before 1950.

None of the world's five major sources of primary energy has grown exponentially since 1975 (Figure 1). World total energy production has not grown exponentially since 1970 (curve 1, Figure 2). *Postulate 1 is verified.*

The average rate of growth of world energy production per capita *(e)* was zero from 1979 to 2003 (curve 2, Figure 2). *Postulate 2 is confirmed through 2003.*

Seventy-four (74) out of the approximately 100 years of the Olduvai Theory are now history (Figure 3). All of the data needed to test it are freely available on the worldwide web and updated annually. Rigorous tests are welcome.

The Olduvai scenario for world population peaks at 6.9 billion circa 2015 (curve 2, Figure 4). Thereafter the population declines to 2.0 billion in 2050 (Postulate 4). A growing number of independent studies concur (see text). ■

ACKNOWLEDGMENTS

Walter Youngquist has bestowed wise guidance and much scientific information over many years. Robert Hickerson, Alistair McCrone, John Attarian, David Pimentel, Virginia Abernethy, and David Burghardt have helped out in many ways. Colin Campbell, Ali Samsam Bakhtiari, Alan Hammaker, and Francis de Winter have provided valuable perspectives on diverse subjects. Richard Pelto's "Third Place Academy" has extended my horizons. Marvin Gregory has passed along a constant stream of useful information. Patrick McNally's keen questions have been very helpful. Ronald Angel has stressed computational rigor. John Greer has fostered localized rural communities. The web sites of Jay Hanson, Ronald Swenson, and Tom Robertson have bought forth many useful discussions and suggestions from around the world.

ENDNOTES

1. Hydrocarbons, of course, are the crucial source of primary energy for industrial civilization – as it now exists. However *if* we had abundant and affordable electric power from other sources, *then* civilization – in some form and at some population level – could continue indefinitely sans hydrocarbons.

2. "We have, in the above generalizations *the* law of cultural evolution: *Culture develops when the amount of energy harnessed by man per capita per year is increased; or the efficiency of the technological means of putting this energy to work is increased; or, as both factors are simultaneously increased*" (White, 1943). But as far as I know no one has ever quantified how world total energy efficiency has changed over time.

3. Engineers usually represent electromagnetic energy as waves. Physicists often represent it as particles. A coherent theory is lacking.

4. The OT says that permanent blackouts will be the instantaneous (direct) cause of collapse of industrial civilization. In contrast, the deeper causality will be a complex matrix of delayed feedback interactions, including: depletion of nonrenewable resources, lack of capital and operational investment funds, soil erosion, declining industrial and agricultural production, Peak Oil, global warming, pollution, deforestation, falling aquifers, unemployment, resource wars, and pandemic diseases – to name just a few.

5. For exponential growth the year-on-year incremental changes must be positive and exponential; for exponential decline they must be negative and exponential.

6. The exponential doubling time ('DT' in years) is approximately equal to *69.3/PctG* where *'PctG'* is the average percent growth per year (Bartlett et al., 2004, p. 396).

7. One boe = 5.46 million Btu (heat value).

8. Worthy of note in Figure 3 is how clearly the plot of Ackerman's Law *(e)* reveals the Great Depression and World War II.

9. By definition, all scenario curves, dates, and scales are approximate.

10. System dynamics is a methodology for studying, testing, and managing complex, nonlinear, feedback systems, such as one finds in business and other social systems. See: www.albany.edu/cpr/sds.

DEFINITIONS

"Scenario" means an outline for any series of events – real, imagined, or tutorial. "Circa" indicates an approximate year. "Oil" means crude oil and natural gas liquids. "Total energy" means the world's five major sources of commercial energy combined: oil, natural gas, coal, hydroelectricity, and nuclear-electricity. "*e*" means energy production per capita. Energy "production" and "consumption" mean the same thing. (Although energy is neither produced nor consumed, these terms are common in the industry.) "*%/y*" means percent per year. "b" means barrels of oil. "boe" means barrels of oil equivalent. "G" means billion (10^9). "T" means trillion (10^{12}). "Industrial civilization," "electromagnetic civilization," and "modern civilization" all mean the same thing. "C.E." means Common Era; "B.C.E." means Before Common Era. "Brinkmanship" means the policy of pursuing a hazardous course to the brink of catastrophe.

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CONGRESS OF THE UNITED STATES

For Immediate Release: Contact: (Bartlett) Lisa Wright at 202-225-2721

March 29, 2007 (T. Udall) Marissa Padilla 202-225-6190

New GAO Peak Oil Report Provides Urgent Call to Action: U.S. Vulnerable and the Government Unprepared for Unacceptably High Risks of Oil Supply Shock

Washington, DC - Congressmen Roscoe Bartlett (R-MD) and Tom Udall (D-NM), co-chairmen of the Congressional Peak Oil Caucus, held a Capitol Hill news conference with Mark E. Gaffigan of the U.S. Government Accountability Office (GAO) on Thursday, March 29, 2007 to discuss the release of an embargoed GAO report that revealed the United States is *particularly vulnerable* and the United States federal government is *unprepared* to respond to severe consequences from increasing and unacceptable risks of significant disruptions to oil supplies from peak oil and other above ground political and economic factors. "CRUDE OIL - Uncertainty about Future Oil Supply Makes It Important to Develop a Strategy for Addressing a Peak and Decline in Oil Production," (GAO-07-283) is now available for downloading from the GAO website: www.gao.gov.

The report reaffirmed that peak oil is inevitable. It is the point of maximum oil production followed by irreversible declines for oil fields, regions, countries and eventually the world. The report found most experts project a peak and subsequent decline in world oil production could occur ***without warning*** any time between now and 2040. The quality and availability of data concerning oil reserves and production capabilities makes projections uncertain. In addition, significant above ground political and economic risks to increasing world production are detailed affecting a large majority of world reserves. Coupled with rising demand, these factors show increasing risks of significant disruption to oil supplies. The report found no focus, coordination or plans by the federal government to prepare for peak oil or other potential supply disruptions.

Congressman Roscoe Bartlett said, "This GAO peak oil report is a clarion call for leadership at the highest level of our country to avert an energy crisis unlike any the world has ever before experienced and one that we know could happen at any time. Only the President can rally the country to take the urgent steps necessary. Potential alternatives to oil are extremely limited. Technology won't save us without time and money to develop and scale them up."

1

Congressman Tom Udall said, "Today's report once again emphasizes our need to prepare for peak oil by implementing forward-thinking approaches and advance initiatives that will move our nation toward greater energy stability and independence. Practical legislation coupled with a concerted focus on conservation, higher fuel efficiency standards, energy saving buildings and appliances, revival of passenger and freight rail, expanded research into and use of biofuels will make the difference. I wholeheartedly believe in the ingenuity and intelligence of our countrymen and women to achieve these ambitious goals."

Projecting future oil supplies is highly uncertain, in part, because the Organization of Petroleum Exporting Countries (OPEC) controls most of the estimated world oil reserves, but its estimates of reserves are not verified by independent auditors. In addition, four countries—Iran, Iraq, Nigeria, and Venezuela hold one-third of proven oil reserves and are considered at high risk for political disruption.. Countries with medium or high levels of political risk contained 63 percent of proven worldwide oil reserves. According to GAO's analysis, "85 percent of the world's proven oil reserves are in countries with medium-to-high investment risk or where foreign investment is prohibited."

"A number of studies [GAO] reviewed indicate that most of the U.S. recessions in the post-World War II era were preceded by oil supply shocks and the associated sudden rise in oil prices. Ultimately, however, the consequences of a peak and permanent decline in oil production could be even more prolonged and severe than those of past oil supply shocks. Because the decline would be neither temporary nor reversible, the effects would continue until alternative transportation technologies to displace oil became available in sufficient quantities at comparable costs."

The United States and the transportation sector are identified as particularly vulnerable to disruptions and dislocations from peak oil. "In the United States, alternative transportation technologies have limited potential to mitigate the consequences of a peak and decline in oil production, at least in the near term, because they face many challenges that will take time and effort to overcome… Development and widespread adoption of the seven alternative fuels and advanced vehicle technologies [GAO] examined will take time, and significant challenges will have to be overcome, according to DOE."

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From: Speelman, Harry [mailto:SpeelmH@wsdot.wa.gov]
Sent: Thursday, September 15, 2011 11:46 AM
To: Columbia River Crossing
Subject: FEIS email notification

P-091-001 Why do you not drop the light rail component of the project?

HARRY SPEELMAN,CPPB
SW REGION PURCHASING MANAGER
PHONE: (360)905-2286
FAX: (360)905-2292
E-MAIL: SPEELMH@WSDOT.WA.GOV

P-091-001

Light rail is an integral part of the CRC project. Light rail has been endorsed by every local Sponsoring Agency (Vancouver City Council, C-TRAN, RTC, Portland City Council, TriMet, and Metro), whose boards include elected leadership from throughout the area.

Annual light rail passenger trips crossing the I-5 bridge in 2030 are projected to be 6.1 million, with daily ridership around 18,700. The travel time for the morning commute by light rail between downtown Vancouver and Pioneer Square in downtown Portland will be approximately 34 minutes. Light rail would travel on a dedicated right-of-way, with more reliable travel times than auto drivers dealing with unpredictable road conditions, traffic congestion, and parking challenges.

The CRC project planning for light rail incorporates and supports the principles of Vancouver's City Center Vision Plan. Downtown Vancouver has seen recent growth in higher density mixed use projects from three to 12 stories in height. In addition, another 4,000 downtown condominiums are proposed or pending as part of new developments. The core of Vancouver has, along with many of the larger corridors such as Fourth Plain Blvd, medium to high density residential development and an urban mix of uses. Transit demand in these areas is quite high, and ridership will increase with the introduction of light rail.

Hines, Maurice

From: stevescare@aol.com
Sent: Friday, October 21, 2011 7:10 AM
To: Columbia River Crossing
Subject: voting abolished

P-092-001

There is absolutely no way this project should move forward without voter approval.

The level of controversy and potential scandal involded make it mandatory.

Worst yet is the obvious public opposition to light rail being extended to Vancouver.
Made more obvious by the deliberate prohibition of voting by public officials who know the outcome.

With the economy in total flux and all things in a new economy of desperation we cannot afford to allow officials to act as nothing is new.

1

P-092-001

There will not be a public vote on construction of the various CRC project elements. However, as a public project, it must be approved and funded by the decisions of elected officials who are themselves directly elected by voters. Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on pursuing a public vote.

Hines, Maurice

From: rswaren2002@comcast.net
Sent: Monday, October 24, 2011 3:35 PM
To: Columbia River Crossing
Subject: CRC project

P-093-001 I don't think the CRC project is, at all, appropriate, for our region for the following reasons

1. The claim for 25-30,000 jobs is wildly inflated having worked in heavy construction for most of my career I would wager that a lot of jobs will go to out of state contractors and to their regular workforces which are looking for new jobs. Furthermore, even in the spinoff there would not be anything close to 25,000 and those would be TEMPORARY.

P-093-002 2. The CRC project, by removing businesses presently in its path will TAKE AWAY several hundred PERMANENT FULL TIME JOBS.

P-093-003 3. The long term financing for this project is very unclear. What impact will tolling have on the local economy? What will tolls actually cost before the project is paid off! Will local government intend to use future tolls for other projects?

P-093-004 4. When all is said and done, we still only have two access routes across the Columbia. Meanwhile we are in the middle of a growing transportation corridor, the Interstate 5 system. Other cities and states rely on the I-5 for their own economy and people and goods must move through here on their way elsewhere.. Trying to limit Columbia crossings to only two is economically RISKY. The only similar analogy is in Memphis TN which has two crossings of the Mississippi River, yet a suburb only one tenth the size of Clark Co. Washington.

OVERALL, THE CRC IS A VERY BAD PLAN.

Ron Swaren

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P-093-001

The job estimations were developed using standard methodologies, which were reviewed by staff in all sponsoring agencies.

P-093-002

The LPA will displace businesses, as addressed in FEIS Section 3.3 Property Acquisitions and Displacement, and in the Property Acquisitions and Displacement Technical Report. These displacements will affect businesses with employees, as addressed in FEIS Section 3.4 Land Use and Economics, and in the Economics Technical Report. However, the displacement of businesses and jobs will be offset to some degree by the project creating or sustaining jobs over the life of the project.

P-093-003

The issue of economic impacts was addressed as part of the economics analysis and is described in detail in the Economics Technical Report. This report, and Chapter 3 (Section 3.4) of the FEIS, note that the increased costs incurred because of tolls would generally be offset by the improved travel options and travel times. Under existing and No Build Alternative conditions, congestion delays and high crash rates have significant costs for local businesses and travelers; improving these conditions is one of the purposes of the project.

Tolls could discourage home-based shopping trips from Clark County to points in northern Oregon, such as Hayden Island and Airport Way. However, the variable-rate toll structure that was evaluated in the DEIS allows for different rates to be charged by time of day. Therefore, discretionary trips, such as those between Oregon and Washington for retail purposes, could be taken in off-peak hours when toll rates are at their lowest, reducing the effect of the tolls on these types of trips. Also, CRC would provide improved transit connections between Clark County and Oregon, offering travelers a toll-free alternative for reaching destinations across the river.

Tolling I-205 or any other facility is not part of this project, but could be implemented separately. With few exceptions, federal statutes do not permit tolling of an existing interstate highway without associated improvements. FHWA does have pilot programs that allow state departments of transportation to apply for approval to toll a facility. Local and State governments are struggling to fund needed infrastructure improvements and maintenance. Tolls, user fees, and other systems that require "users" to pay additional costs are likely to become increasingly common.

P-093-004

While a third crossing would provide some benefits, and several new crossing options were considered in the CRC alternatives analysis and screening, none of them would adequately address the fundamental needs that have been identified for this project, as discussed in Chapter 2 of the FEIS.

Hines, Maurice

From: Michael Szporluk [mszporluk@yahoo.com]
Sent: Monday, October 24, 2011 6:32 PM
To: Columbia River Crossing
Subject: CRC feedback

To whom it may concern,

P-094-001 I understand that residents have until midnight tonight to provide feedback on the CRC as part of the EIS process.

I am an Portland Oregon resident who strongly opposes the CRC construction project as outlined by the project team.

There are environmental and financial reasons for my opposition.

First, even if constructed, it would not resolve the problem it is intended to resolve. it will encourage more use of the freeway, thereby shifting congestion into the rose quarter.

P-094-002 Second, by encouraging more use of the freeway, we will raise emissions, rendering it more difficult if not impossible to meet our climate goals.

P-094-003 Third, the financing isn't in place to complete the project, and given the state of the economy, it is unlikely that the Feds will have the funds the states of Oregon and Washington are relying on.

P-094-004 Fourth, there are significantly cheaper and better alternatives that have not been explored sufficiently.

I'm a registered voter and tax payer -- and do not want to see my money to go to such a project. Its time to put the CRC project to rest. If you go forward with the project, you're only setting the residents of Oregon and Washington back.

regards,

Michael Szporluk
Portland, Oregon

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P-094-001

The proposed new add/drop lanes (i.e., lanes that connect two or more interchanges) are used to alleviate safety issues associated with the closely spaced interchanges in the project area and are not designed to increase capacity generally on I-5. 68% to 75% of I-5 traffic in the project area enters and/or exits I-5 within the CRC project area, and these add/drop lanes provide space for this traffic to do so without disrupting cars and trucks traveling to destinations further north and south of the project area. The project does not propose to add lanes north or south of the project limits.

The DEIS evaluation found that the project, with a toll and light rail, would actually reduce the total daily volume of traffic using the I-5 and I-205 river crossings by approximately 3%. The FEIS analysis of the project has been updated to include an evaluation of how the CRC project would affect Vehicle Miles Traveled (VMT) (see Chapter 3, Section 3.1). Rather than inducing sprawl, the CRC project will likely reinforce the region's goals of concentrating development in regional centers, reinforcing existing corridors, and promoting transit and pedestrian friendly development and development patterns. In 2010, Metro ran the MetroScope model (an integrated land use and transportation model) to forecast growth associated with transportation improvements of a 12-lane river crossing and light rail to Clark College. The model showed only minimal changes in employment location and housing demand compared to the No-Build. For more information see FEIS Chapter 3, Section 3.4.

P-094-002

Based on modeling and analysis, the CRC LPA is expected to significantly increase transit ridership and reduce the number of vehicles crossing the river. This shift toward transit, reduction in auto crossings, reduced congestion, removal of bridge lifts, and lower accident rates are all factors that contribute to lower CO_2 emissions with the project than

without it.

These factors will also make it easier for the region to meet goals for reducing greenhouse gas (GHG) emissions. Chapter 3 (Section 3.19) of the FEIS summarizes the results of GHG emissions and climate change analysis conducted for the alternatives.

P-094-003

A project almost never has the funds for construction during the decision making process and environmental analysis. It is the Record of Decision that completes the environmental phase and positions the project to receive funding for construction. Please refer to Chapter 4 of the FEIS for a description of the current plans for funding construction and operation of the LPA. This discussion provides an updated assessment of likely funding sources for this project, though it is not common practice to receive funding commitments prior to completion of the alternative selection process. As described in the FEIS, project funding is expected to come from a variety of local, state, and federal sources, with federal funding and tolls providing substantial revenue for the construction.

P-094-004

The alternatives evaluation and screening process, described in Chapter 2 of the FEIS, considered a wide range of alternatives. Proposals that arose after the DEIS was developed were also considered. The rationale for the Selected Alternative is described in the ROD and in Chapter 2 of the FEIS.

Hines, Maurice

From: Savannah Teller-Brown [savannahteller@gmail.com]
Sent: Monday, October 24, 2011 8:23 PM
To: Columbia River Crossing
Subject: oppose

P-095-001

i am writing to express my opposition to the columbia river crossing.
it just doesn't make sense environmentally or financially.

thank you,

savannah teller brown
NE portland

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P-095-001

Significant work has gone into developing the CRC project, including an ongoing public involvement effort. The public involvement program includes numerous advisory groups to ensure that the values and interests of the community are reflected in project decisions. These groups include representatives of public agencies, businesses, civic organizations, neighborhoods, and freight, commuter, and environmental groups. Feedback from the general public and advisory groups has been generally supportive of the project, including support for the transit, bicycle, pedestrian, highway, interchange, and financing elements of the project. See Chapter 2 (Section 2.7) of the FEIS for more discussion on the process used to develop project alternatives and select a Locally Preferred Alternative.

Hines, Maurice

From: Richard Thomas [rtcouv@gmail.com]
Sent: Monday, October 24, 2011 5:20 PM
To: Columbia River Crossing
Subject: CRC

To whom it may concern:

P-096-001

I have lived on both sides of the Columbia and in east and west Portland metro for about 30 years and have a front row seat to the efforts to handle mass transit. What we have devolved to today is a huge industry in this area devoted to massive projects totally isolated from the realities of public opinion and fiscal prudence.

The heart of the CRC project is the unilateral DEMAND from Portland to include light rail. Once again, the people of Vancouver and Clark County have said no. Metro Portland voters said NO-- twice.

P-096-002

But you know all of this, as well as the dismal financial performance of the existing system. You have ignored facts and statistics that refute the value of such a huge proposal. To date, the CRC syndicate has spent well over $100 million in an attempt to force the issue. No independent analysis will ever justify the existing plans, but onward you go.

P-096-003

Of the many unintended consequences from the current plan is the loss of revenue to Portland area businesses. Put a toll on these bridges and many people will factor that in to whether to shop in Oregon. The savings on sales tax will not be enough to breach the physic barrier created by a toll.

P-096-004

WE the People, don't want it, can't afford and won't stand for it. You cannot cram this monstrosity down our throats.

Richard Thomas
Vancouver, WA

360-241-5228

--
Richard Thomas

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P-096-001

Light rail has been endorsed by every local Sponsoring Agency (Vancouver City Council, C-TRAN, RTC, Portland City Council, TriMet, and Metro), whose boards include elected officials from throughout the area.

Annual light rail passenger trips crossing the I-5 bridge in 2030 are projected to be 6.1 million, with daily ridership around 18,700. The travel time for the morning commute by light rail between downtown Vancouver and Pioneer Square in downtown Portland will be approximately 34 minutes. Light rail would travel on a dedicated right-of-way, with more reliable travel times than auto drivers dealing with unpredictable road conditions, traffic congestion, and parking challenges.

The CRC project planning for light rail incorporates and supports the principles of Vancouver's City Center Vision Plan. Downtown Vancouver has seen recent growth in higher density mixed use projects from three to 12 stories in height. In addition, another 4,000 downtown condominiums are proposed or pending as part of new developments. The core of Vancouver has, along with many of the larger corridors such as Fourth Plain Blvd, medium to high density residential development and an urban mix of uses. Transit demand in these areas is quite high, and ridership will increase with the introduction of light rail.

Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on having a public vote.

P-096-002

All specific comments and criticisms received have been considered. The FEIS analysis and findings show benefits from the selected alternative, as well as adverse impacts. Independent analysis was provided on many topics, as discussed in the FEIS.

P-096-003

This issue was addressed as part of the economics analysis and is described in detail in the Economics Technical Report. This report, and Chapter 3 (Section 3.4) of the DEIS, note that the increased costs incurred because of tolls would generally be offset by the improved travel options and travel times. Under existing and No-Build Alternative conditions, congestion delays and high crash rates have significant costs for local businesses and travelers; improving these conditions is one of the purposes of the project.

Tolls could discourage home-based shopping trips from Clark County to points in northern Oregon, such as Hayden Island and Airport Way. However, the variable-rate toll structure that was evaluated in the DEIS allows for different rates to be charged by time of day. Therefore, discretionary trips, such as those between Oregon and Washington for retail purposes, could be taken in off-peak hours when toll rates are at their lowest, reducing the effect of the tolls on these types of trips. Also, CRC would provide improved transit connections between Clark County and Oregon, offering travelers a toll-free alternative for reaching destinations across the river.

P-096-004

Significant work has gone into developing the CRC project, including an ongoing public involvement effort. The public involvement program includes numerous advisory groups to ensure that the values and interests of the community are reflected in project decisions. These groups include representatives of public agencies, businesses, civic organizations, neighborhoods, and freight, commuter, and environmental groups. Feedback from the general public and advisory groups has been generally supportive of the project, including support for the transit, bicycle, pedestrian, highway, interchange, and financing elements of the project. See Chapter 2 (Section 2.7) of the FEIS for more discussion on

the process used to develop project alternatives and select a Locally Preferred Alternative.

From: Robert Tice [mailto:robtice2@gmail.com]
Sent: Sunday, September 25, 2011 7:05 PM
To: Columbia River Crossing
Subject: Final Environmental Impact Statement.

P-097-001

Please advise as the authority for a charge of $60 for a written copy of the statement.

Please promptly forward the profered C.D. of the Columbia River Crossing Final Environmental Impact Statement AND, if allows, an Executive Summary of same to:

Robert Tice
515 West 21st Street
Vancouver, Wa. 98660

Thank you,

Robert L. Tice

P-097-001

A response and these materials were provided on the 28th of September.

Hines, Maurice

From: Stephanie Turlay [bsturlay@comcast.net]
Sent: Monday, October 24, 2011 11:56 AM
To: Columbia River Crossing
Subject: CRC

P-098-001 With so many discrepancies in the CRC project, some critical, why has no one from the CRC owned any of them? Corrected them? Explained them?

Stephanie Turlay
bsturlay@comcast.net

P-098-001

Multiple methods have been used to engage the public so as to address the needs of a wide variety of people in the project decision-making process. Public feedback has helped guide the outreach effort. Examples include workshops with facilitated small-group discussions, open houses where participants can talk one-on-one with staff, public hearings, presentations and discussions at community and neighborhood-sponsored meetings (often at the group's request), and advisory group meetings where CRC seeks recommendations from a citizen committee. These events and meetings have taken place at a variety of locations, days of the week, and times of the day to meet the needs of the entire community. For more information on the project's public outreach, please see Appendix B (Public Involvement) of the FEIS.

Hines, Maurice

From: Tweet [tweetfamily@comcast.net]
Sent: Monday, October 24, 2011 10:54 PM
To: Columbia River Crossing
Subject: Feedback on the proposed Columbia River Crossing project, please confirm you got this message by reply

P-099-001

I am against the CRC project as currently planned. I am a Ph.D. physicist working in industrial research for over 20 years with 75 US patents and over 75 technical publications. So, I know something about math, logic, and reasoning.

1) **No Need for Light Rail.** The numbers and case made for the CRC makes no sense to me whatsoever. In particular, the demand that ¼ of the cost be spent on light rail is completely absurd. I have spent 9 years of my life living in Japan. I know what high density conditions are like, where a train system is a necessity. We have nothing like that here in the Vancouver area, and we are unlikely to have anything remotely approaching a need for light rail in the next 100 years. Indeed, at least two of the local public officials who are cheerleaders for this project have admitted in writing or public meetings that light rail is a want, not a need, and probably won't be a need for 20-30 years. We have far more important and useful ways to spend our tax money (or not spend it, since we are simply borrowing it from our great-grand children).

P-099-002

2) **False Projections**. The projections used by the CRC to justify this project have already been proven to be false. In particular, traffic projections made in 2006 have already found to be significantly overestimated. But the lie is perpetuated, since these same false projections are being used in the EIS to continue to justify the CRC plan with light rail! This is a blatantly dishonest practice! If I did this in my job, I would justifiably fired on the spot! It seems only the government can get away with this! Bernie Madoff would be proud! If they can't predict 5 years in the future, how are we to believe their projections 30 years into the future?

P-099-003

3) **Light Rail is the Most Inflexible and Expensive "Solution" to Traffic Problems**. I find this obsession with light rail to be completely illogical. To spend ¼ of the cost on a totally inflexible and exorbitantly expensive system that serves only 2 to 3% of the commuters makes no sense at all. Why go with the most expensive solution? Buses are far cheaper and vastly more flexible than trains. HOV lanes are nearly free and can be extremely effective. There are much easier solutions.

P-099-004

4) **Trains are Old Technology**. One of the areas I work on is renewable energy, including solar and batteries. This last May I was at a research conference on electric vehicles held at Pacific Northwest National Lab in Richland Washington. Famous scientists and engineers from all over the world were there describing the amazing progress being made in new battery technology. Prof Yet-Ming Chang of MIT showed some particularly impressive work with his new "ooze" battery, and had formed a company, M24, to commercialize it. Prof. Chang has already successfully commercialized other battery technologies with his company, A123 Systems. My point is that, in 20 to 30 years we may all be driving electric vehicles. We may also be driving vehicles that practically drive themselves, so that rush hour traffic can be much denser, yet safer. Some of this technology is already coming to market. So, why lock ourselves into trains running on fixed tracks, a 19th century technology, when we live in the 21st? After all, 20 years ago, the Prius wasn't even on Toyota's drawing board yet!

1

P-099-001

Light rail has been endorsed by every local Sponsoring Agency (Vancouver City Council, C-TRAN, RTC, Portland City Council, TriMet, and Metro), whose boards include elected leadership from throughout the area.

Annual light rail passenger trips crossing the I-5 bridge in 2030 are projected to be 6.1 million, with daily ridership around 18,700. The travel time for the morning commute by light rail between downtown Vancouver and Pioneer Square in downtown Portland will be approximately 34 minutes. Light rail would travel on a dedicated right-of-way, with more reliable travel times than auto drivers dealing with unpredictable road conditions, traffic congestion, and parking challenges.

The CRC project planning for light rail incorporates and supports the principles of Vancouver's City Center Vision Plan. Downtown Vancouver has seen recent growth in higher density mixed use projects from three to 12 stories in height. In addition, another 4,000 downtown condominiums are proposed or pending as part of new developments. The core of Vancouver has, along with many of the larger corridors such as Fourth Plain Boulevard, medium to high density residential development and an urban mix of uses. Transit demand in these areas is quite high, and ridership will increase with the introduction of light rail.

Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on having a public vote.

P-099-002

Traffic forecasts reported in the DEIS and used to inform decisions on a locally preferred alternative were derived from adopted regional employment and population forecasts, and from state-of-the-art modeling and evaluation conducted by Metro, RTC, and the project team. These

P-099-005

5) **No Trust in Management of Project.** The gross mismanagement of this project by the CRC, along with the arrogance and obscene over-charging of taxpayers by the primary vendor, Dave Evans and Associates is enough to justify cancelling the project and starting completely over with a totally new cast of characters. This is detailed in the excellent reports by the Forensic Auditor, Tiffany Couch. Dave Evans and Associates is even suing to keep from having to explain how they have spent millions of dollars they have gotten from Washington State taxpayers. That alone should be reason enough to ban them from bidding on any more government projects.

P-099-006

6) **Demand for County-Wide Vote.** Before this project is settled, all voters in Clark County (and perhaps surrounding counties) who will be forced to pay for this farce must be allowed to vote on it, at the very least whether light rail should be included. To do otherwise is to force this down our throats and is unconscionable, and should be illegal, if it isn't already.

Sincerely,

Douglas J. Tweet, Ph.D.
2715 NW 34th Circle
Camas, WA 98607

traffic forecasts were reviewed by all project sponsor agencies as well as FTA and FHWA.

An independent panel of traffic modeling experts was convened in October 2008 to review the modeling methods and findings. These experts concluded that the project's approach to estimating future travel demand was reasonable and that it relied on accepted practices employed in metropolitan regions throughout the country. These findings are summarized in the "Columbia River Crossing Travel Demand Model Review Report" (November 25, 2008). This independent review confirmed the CRC modeling approach used to address multiple variables that can affect travel demand, including gasoline prices, tolling, travel demand measures, and induced development.

The number of trips on I-5 across the river is projected to reach 184,000 in 2030. Even if this level of traffic did not occur until 2050, the facility would still need to accommodate it. And the facility is intended to have decades of functional service.

P-099-003

As illustrated in the DEIS, and summarized in Exhibit 29 (page S-33) of the Executive Summary, light rail would better serve transit riders than bus rapid transit (BRT) within the CRC project area. Light rail would carry more passengers across the river during the PM peak, result in more people choosing to take transit, faster travel times through the project area, fewer potential noise impacts, and lower costs per incremental rider than BRT. Additionally, light rail is more likely to attract desirable development on Hayden Island and in downtown Vancouver, which is consistent with local land use plans.

High occupancy vehicle (HOV) lanes work when they are part of a network, and could potentially be a useful tool in the CRC area if employed as part of a regional plan. The five-mile CRC project by itself is

too short in length to provide the true benefits of HOV lanes, but should the region adopt and develop an HOV system, lanes within the bridge influence area could potentially be designated as part of the network.

The CRC project team has looked at HOV lanes and freight lanes, which are typically located on the inside freeway lane next to the barrier, as part of its technical analysis. Because about 70 percent of the vehicles enter and/or exit I-5 within the five mile study area, access to and from a HOV lane or freight lane could create traffic operational problems by increasing lane changes (for example, HOVs entering the freeway and needing to merge all the way to the inside lane). The results of this analysis are described in more detail in Section 3.1 of the DEIS.

P-099-004

Changing technology, peak oil, and other projections of future conditions have been considered. While automated personal vehicles could eventually dramatically increase interstate capacity, it is not likely to eliminate or significantly diminish the demand for public transit, particularly in the foreseeable future. Mode choice depends on much more than just the volume-to-capacity ratio of interstate links. For example, parking capacity and cost are also significant factors in mode choice. See the CRC Traffic Technical Report for further discussion of factors that affect mode choice.

P-099-005

Past financial performance is an important issue but is not relevant to the NEPA review process. The Record of Decision concludes the NEPA analysis. It indicates which alternative has been selected by the federal government, and allows for the continued design, eligibility for federal funding and permitting, and eventual construction of that alternative. The Locally Preferred Alternative is supported by local, regional, state, and federal agencies and has been selected following an exhaustive analysis and public involvement program.

The project takes the issues of financial management very seriously. The project is currently developing new financial reporting mechanisms and has started providing monthly reports on the internet. The project will continue to work with the public to improve transparency and an understanding of the resources required for an undertaking of this scale.

P-099-006

There will not be a public vote on construction of the various CRC project elements. However, as a public project, it must be approved and funded by the decisions of elected officials who are themselves directly elected by voters. Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on pursuing a public vote.

Hines, Maurice

From: Tweet [tweetfamily@comcast.net]
Sent: Monday, October 24, 2011 11:32 PM
To: Columbia River Crossing
Subject: CRC feedback. please confirm receipt.

CRC- feedback

P-100-001

1)The proposed replacement bridge adds no thru lanes, only merging lanes. An earlier phase of the project did include an added thru lane in each direction, and no reasonable justification is given for cutting that out. To rebuild the bridge without any added thru capacity will not help traffic flow.

P-100-002

2)"According to the Regional Transportation Council, the bridge carries about 3,300 transit trips per day. That means only 2.4 percent of all trips that cross the bridge are on public transit. Adding light rail to the bridge would increase costs by about $1.17 billion. This means local officials want to spend 40 percent more in order to serve 2.4 percent of total bridge crossings." click link

3) Local officials have noted that light rail in Clark County is a want, not a need. Supposedly, it may become more practical in 20-30 years. Yet the CRC insists on building it ASAP. Population and traffic projections used by the CRC are now considered highly inflated and cost estimates are understated based upon outside expert review. When or if population and job density will be high enough to support light rail remains to be seen. Today, job losses and foreclosures dominate the outlook, and growth remains uncertain. Meanwhile, CRC racks up $$MILLIONS in charges with insufficient explanation of how public $$are spent. A forensic accountant has analyzed the financial documents.
"*She found that the CRC was unable to adequately account for how it spent $108 million in public funds between July 2005 and February 2011. Oddities included invoices totaling $15 million lacking vendor names and invoices worth $38 million that lacked codes to identify services rendered*" The general contractor has since filed in court to keep financial records from public scrutiny. Follow the $$$link

4)What will transportation technology be like in 20 years? Why spend $$we don't have today for something we may not need in 20 years? With rapidly changing technology, closer timing to reaching true need insures the best options available are selected.
What is higher priority? Roads that serve all, or light rail that serves only passengers travelling to limited destinations? Roads carry freight that stocks stores, medical centers and businesses, specialized service vehicles and trucks , and emergency vehicles. Roads provide flexibile routes to more destinations for buses, vanpools, or carpools that serve public transit needs.
Light rail is limited to fixed routes and still requires time consuming transfers to bus for many destinations. On the Oregon side, light rail doesn't come near enough to the businesses to make it practical. Transfer to a bus is needed, so that starting out on a bus is less time consuming in the long run.

5)What is more cost effective? Light Rail costs of $237 million/ mile in Seattle and $204 million/ mile in Portland far exceed the cost of building and maintaining roadways.
Why light rail? Mass transit options like light rail and bus rapid transit have been eligible for federal pots of gold, creating incentives to build regardless of the cost. Those connected to the light rail business are some of the strongest proponents for it.

P-100-003

5)Locally Preferred Alternative?
The following cities have a representative on the Ctran board.
Battleground, Ridgefield/Yacolt, and Camas/Washougal. The same is true for the Regional Transportation Council, RTC.
The representatives for the RTC and Ctran voted on the "locally preferred alternative" of light rail and a replacement I-5 bridge in some cases without the city council members knowing about the vote beforehand. Citizens were not informed of the upcoming vote through a local public hearing on a preferred alternative in any of these cities. Neither did any of these city councils vote to give their C-tran or RTC representative direction in how to vote on the "locally preferred alternative".
Some C-tran representatives explained that they spoke with some of the council about the decision, and it's unclear how much if any of this discussion took place in an open public meeting.

1

P-100-001

Following the selection of the LPA in July of 2008, the CRC Project Sponsors Council (PSC) was developed to provide recommendations to the project on a variety of issues, including the number of add/drop lanes over the river crossing. Over the course of several months, PSC was provided with operational characteristics and potential environmental impacts of 8-, 10-, and 12-lane options. These technical evaluation criteria included, but were not limited to, traffic safety, congestion, traffic diversion onto local streets and I-205, regional vehicle miles travelled, transit ridership, regional economic impact, effects to neighborhoods, and protected species and habitats. In additional to the technical information, PSC received input from CRC advisory groups and reviewed public comment submitted to the project and obtained during two public Q&A sessions in January 2009 regarding the number of lanes decision, as well as hearings conducted by Portland City Council and by Metro Council. In August 2010, the PSC voted unanimously to recommend that the replacement bridges be constructed with 10 lanes and full shoulders, see Chapter 2 (Section 2.7) of the FEIS.

The proposed new lanes are add/drop lanes (i.e., lanes that connect two or more interchanges), which are used to alleviate safety issues associated with the closely spaced interchanges in the project area, and accommodate the 68% to 75% of traffic that enters and/or exits I-5 within two miles of the Columbia River.

P-100-002

As described in Chapter 3 (Section 3.4) of the DEIS and FEIS, and in the Indirect Effects Technical Report, highway capacity improvements and access improvements can induce development in suburban and rural areas that were not previously served, or were greatly underserved, by highway access. The DEIS outlines a comprehensive analysis of the potential induced growth effects that could be expected from the CRC project. A review of national research on induced growth indicates that

P-100-003

In contrast, other cities in Washington openly discuss transportation at meetings and adopt formal motions to give their transit representative direction on how to vote for the city. When I asked about the lack of local public hearings for the approximately $4-8.7 Billion CRC "Locally Preferred Alternative", the response from Camas City Councilor Dietzman and Washougal Mayor Guard was that the law does not require a public hearing. Councilor Dietzman further explained at a Ward meeting that other boards, such as the mosquito board, rarely hold public hearings as a justification for not holding a local public hearing on the CRC "Locally Preferred Alternative".
Nevertheless, it is good practice and open government to hold a local public hearing and take a council vote in each city on such a large regional transportation project. It will impact I-205 bridge traffic from I-5 traffic diverting to avoid the toll. (Which could lead to tolling the I-205 bridge to even out traffic, make it fair, etc). Careful scrutiny is necessary prior to such a building project to insure it best meets our local needs in the most cost effective and efficient manner possible. The best means to find out what the locals prefer is to hold the planned light rail vote, which has been delayed. The vote should be held PRIOR to a final decision to bring light rail in to Clark County.

Will the C-tran board allow Camas and Washougal citizens to vote on light rail and bus rapid transit in 2012? There is no guarantee. If the light rail vote had been held this November as planned, Camas and Washougal voters would have automatically had a vote. However, our C-Tran representative and the CTRAN board voted to delay the promised light rail vote. A law was put in place to allow for a subdistrict vote starting in July 2012, that could cut out Camas and Washougal, and north county voters at the will of the C-Tran board. I believe the C-tran light rail/high capacity transit vote should be district-wide to include all cities in the district since all are taxed for public transportation and all will be impacted if costly light rail is introduced. Regardless of where one lives in the county, all
End up paying the C-tran sales tax when they shop in the larger urban areas where most of the stores are located.

P-100-004

What happened to the 3rd bridge port to port connection that would better handle more traffic?
This option was eliminated without the same serious study the light rail and I-5 bridge replacement was give.
This makes more sense because it connects 2 industrial areas and freight traffic, and alleviates traffic with a new corridor.
From the fairs I attended this summer near the 3rd bridge now booth, it seems it is the "locally Preferred Alternative"
of many as it opens up 2-3 new lanes in each direction for traffic AND freight.

The process is broken. Only one bid from one contractor for one bridge, no local public hearings or votes in the cities supposedly "represented" on the C-Tran or RTC boards, no accounting for $ Millions.

A new crossing should be considered before wasting our transportation $ and consuming the potential for other transportation improvements in our area.

Thank you for your consideration.

Margaret Tweet
2715 NW 34th Circle
Camas, WA 98607

there are six factors that tend to be associated with highway projects that induce sprawl. These are discussed in the Indirect Effects Technical Report. Based on the CRC project team's comparison of those national research findings to CRC's travel demand modeling, Metro's 2001 land use / transportation modeling, and a review of Clark County, City of Vancouver, City of Portland and Metro land use planning and growth management regulations, the DEIS and the FEIS conclude that the likelihood of substantial induced sprawl from the CRC project is very low. In fact, the CRC project will likely support the region's goals of concentrating development in regional centers, reinforcing existing corridors, and promoting transit and pedestrian friendly development and development patterns. The region's goals are reinforced by the project's location in an already urbanized area, the inclusion of new tolls that manage demand, the inclusion of new light rail, and the active regulation of growth management in the region.

In October, 2008, the project convened a panel of national experts to review the travel demand model methodology and conclusions, including a land use evaluation. The panel unanimously concluded that CRC's methods and the conclusions were valid and reasonable. Specifically, the panel noted that CRC would "have a low impact to induce growth… because the project is located in a mature urban area," and that it would "contribute to a better jobs housing balance in Clark County… a positive outcome of the project". These results are summarizes in the "Columbia River Crossing Travel Demand Model Review Report" (November 25, 2008). In 2010, Metro ran the MetroScope model (an integrated land use and transportation model) to forecast growth associated with transportation improvements of a 12-lane river crossing and light rail to Clark College. Even with a 12-lane river crossing, the model showed only minimal changes in employment location and housing demand compared to the No-Build Alternative. For a more detailed discussion regarding potential indirect land use changes as a result of the CRC project, including the likely land use changes associated with the

introduction of light rail, please see Chapter 3 (Section 3.4) of the FEIS.

By 2030, the region's population is expected to increase by one million people. This increase will result in more people needing to travel between home, work, school, recreation, etc. In 2005, 135,000 vehicles crossed the Columbia River on the Interstate Bridge, which led to 4-6 hours of congestion each weekday. By 2030, 184,000 are predicted to cross the river, which would lead to 15 hours of daily congestion if no action is taken. Congestion occurs when vehicle demand is greater than a transportation system's capacity. It results in slower speeds and increased travel times. CRC defines congestion as vehicles traveling less than 30 mph. The Columbia River Crossing project uses information gathered from Metro's nationally-recognized travel demand models to determine the project's effect on congestion. These models predict trip frequency, types or modes of transportation, destination, and time of day. Transportation planners use these models to analyze the effects of such factors as increased population and employment, transportation improvements, and new developments on the transportation system.

Traffic volumes fluctuate and did decrease during some years. Traffic volumes obtained from the Oregon Department of Transportation's automatic traffic recorder (ATR) monitoring sites show that traffic volumes have, in fact, been increasing in the last few years. Whether the traffic volumes forecast for year 2030 will actually be achieved in that year should not be the only consideration. In its July 27, 2010 report, the Independent Review Panel (IRP) expressed concerns about a longer horizon. The IRP commented "The desirability of living in the Portland/Vancouver region is not going to diminish, so populations will continue to grow…. [T]he IRP believes the greatest risk in the decision-making process is not over-sizing the bridges but not building enough capacity for the next 100 years." [1]

Past financial performance is an important issue but is not relevant to the

NEPA review process. The Record of Decision concludes the NEPA analysis. It indicates which alternative has been selected by the federal government, and allows for the continued design, eligibility for federal funding and permitting, and eventual construction of that alternative. The Locally Preferred Alternative is supported by local, regional, state, and federal agencies and has been selected following exhaustive analysis and public involvement program.

The project takes the issues of financial management very seriously. The project is currently developing new financial reporting mechanisms and has started providing monthly reports on the internet. The project will continue to work with the public to improve transparency and an understanding of the resources required for an undertaking of this scale.

Following the close of the 60-day DEIS public comment period in July 2008, the CRC project's six local sponsor agencies selected light rail to Clark College as the project's preferred transit mode. These sponsor agencies, which include the Vancouver City Council, Portland City Council, C-TRAN Board, TriMet Board, RTC Board and Metro Council considered the DEIS analysis, public comment, and a recommendation from the CRC Task Force (a broad group of stakeholders representative of the range of interests affected by the project - see the DEIS Public Involvement Appendix for more information regarding the CRC Task Force) before voting on the LPA.

As illustrated in the DEIS, and summarized in Exhibit 29 (page S-33) of the Executive Summary, light rail would better serve transit riders than bus rapid transit (BRT) within the CRC project area. Light rail would carry more passengers across the river during the PM peak, result in more people choosing to take transit, faster travel times through the project area, fewer potential noise impacts, and lower costs per incremental rider than BRT. Additionally, light rail is more likely to attract desirable development on Hayden Island and in downtown Vancouver, which is

consistent with local land use plans.

[1] Warne, Thomas (2010). I-5 Columbia River Crossing Project, Independent Review Panel, Final Report. Independent Review Panel, Olympia, July 27, 2010.

P-100-003

Over the course of the CRC project, a public involvement program has been used to educate and involve stakeholders and the public in order for them to become active participants in shaping the CRC project. At the time of DEIS publication, the project team had participated in over 350 public events, giving over 10,000 people a face-to-face opportunity to learn about the project and provide meaningful input. In order to encourage the highest levels of attendance as possible, most meetings scheduled by the project team were on weekday evenings or weekends during the day. Meetings have been held primarily within the project area to ensure proximity to those potentially most affected by the project. In addition to public events, the program also enabled significant involvement for those who are unable to attend meetings through the project's website and project update notifications.

Prior to publication of the DEIS, property owners potentially affected by project alternatives were notified directly via mail, and six meetings specifically focused on potential right-of-way needs were held in September of 2007. Extensive outreach has been conducted through distribution of written information in hard copy and electronic form, including comment forms, the creation of a project website, and outreach to local and regional media.

When the DEIS was published, the project's database had grown to over 3,000 e-mail addresses and over 10,000 postal mailing addresses. The database was used to encourage participation in public events and involve the broader community. Through implementation of the public

involvement program, over 3,000 public comments were received before publication of the DEIS and over 1,600 comments were received during the 60-day DEIS comment period. In addition, since the DEIS comment period there have been numerous community meetings, open houses, and public hearings by project sponsors, providing more opportunities for public input and comment.

Please see Appendix B of the FEIS for a broader discussion of the public involvement program, including a list of public involvement events that have occurred related to this project. There will not be a public vote on construction of the various CRC project elements. However, as a public project, it must be approved and funded by the decisions of elected officials who are themselves directly elected by voters. Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on pursuing a public vote.

P-100-004

The 3rd bridge port to port crossing idea was evaluated and removed from consideration, as discussed in Chapter 2 of the FEIS. No additional analysis was required to know that it did not address the identified needs for the CRC project. Other locations for a new crossing were also considered and removed from consideration because they could not adequately meet the purpose and need.

The C-TRAN board and Regional Transportation Council both voted on and approved the locally preferred alternative.

Victor F. Viets
421 N. Tomahawk Island Drive
Portland, Oregon 97217

Nancy Boyd
Director
Columbia River Crossing
700 Washington Street, Suite 300
Vancouver, WA 98660

October 22, 2011

Subject: FEIS Comments

Dear Ms. Boyd

P-101-001

I'm a supporter of the Columbia River Crossing Project but I'm a passionate supporter of protecting and improving the quality of livability for Hayden Island residents. My attached comments on the CRC FEIS identify a number of unresolved conflicts between the CRC Project and the quality of future livability on the Island.

My main concern is that there are several instances where the CRC seems to be backing away from commitments made previously to the Hayden Island Community. For example, I believe both the IPS and the Project Sponsors Council voted unanimously, after months of work with the community, to include the local multimodal bridge in the LPA Hayden Island Interchange, but now we learn it is only an option and that the earlier design is still being considered. Also, the Portland Working Group and CRC consultants worked for months to develop innovative designs for the Hayden Island LRT Station, but now those designs aren't mentioned and a minimal standard station design is shown in the FEIS.

There is also some new information that has never been discussed with the Island community. For instance, there are several newly disclosed business displacements, including the Island's only gas station, along North Jantzen Drive in an area where Island residents have worked with CRC and ODOT staff to reduce the roadway footprint enough to save those businesses.

I do not expect my concerns to be resolved before the ROD but I would appreciate written responses to my FEIS comments from the CRC and a reconfirmation that the CRC will honor its previous commitments to the community and will work openly with the community to find solutions to the remaining conflicts before final design commitments are made.

Respectively

Victor Viets

	NEW Columbia River Crossing FEIS Issues for Hayden Island

Cell: 503-307-4131 v.viets@comcast.net Home: 503-286-1404

P-101-001

Option A, which includes the local multimodal bridge to the island is a firm commitment of the project. The Record of Decision will be based on Option A, including the bridge. And though the Hayden Island station design has evolved, the project remains committed to an innovative design which is based on community input. The design of the station has changed over time because the main roadway and structural designs have changed on the island.

The Portland Working Group (PWG) was formed in May 2009 to advise the project on transit related issues for the Oregon side of the project, using the LPA and Hayden Island Plan as the basis for discussion. Beginning in September 2009, the PWG held a series of three interactive design workshops with CRC project, TriMet, the City of Portland staff and the general public to develop a set of design principles. The design principles capture the community's values while remaining broad enough to apply to the future station design regardless of CRC project decisions that may affect the position of I-5, local road circulation, and land development patterns.

The resulting Hayden Island Light Rail Station Conceptual Design Report (CDR), published January 2010, provides guidance to the CRC project, TriMet, and the City of Portland regarding the Hayden Island station design. PWG members reviewed and approved the report. The CDR solidified the Hayden Island Light Rail Design Principles. CRC is committed to work with the community to advance the station design. Station design work will take place during final design. The Hayden Island LRT station cross section illustrations in the FEIS shows a conceptual design with place holders for station elements. The illustration shows the Hayden Island LRT station as an elevated station with a center platform. Again, the project will continue to work with the Hayden Island community to refine the station area design.

		--Victor Viets 10/13/11
	Topic **FEIS Reference**	**Comment** **Recommendation**
P-101-002	LPA Option A & Option B Ch.2 Pg 2-9	How did the local multimodal bridge become an option without public discussion when it was unanimously approved by the Integrated Project Staff (IPS) and the Project Sponsors Council? Also, the East Side Multi-Use Path (MUP) is now an option in combination with the local bridge. These are the only options in the entire project. No basis for the final decision about which option to build is provided. Recommendation: Delete Option B
P-101-003	"New" Business Displacements and cumulative community impacts Ch. 3 Pg 3-86 – 3-88	Project will now displace 39 island businesses serving primarily local clientele at a loss of $62.7 million in annual sales and 643 local jobs. "New" business displacements announced in the FEIS include the Chevron station (the only gas station on the Island), the car wash, Taco Bell and the Wells Fargo Bank (one of only two banks on the Island). These "new" displacements have not been discussed with the community even though the Island circulation plan and street widths have been discussed extensively in the last two years with CRC and ODOT. During that time, the Island community was assured by the ODOT Director that local concerns would be considered and that on-island interchange access streets would be downed-sized where-ever possible to reduce impacts to the community. Instead, more businesses have been displaced. Also, the ODOT Interchange Area Management Plan has not been developed for the HI Interchange so the public has had no opportunity to review the on-island traffic circulation, access changes to businesses, and justification for permanent business displacements. The LPA now displaces virtually every local business on the Island but the FEIS does not recognize that as major impact on community livability. Recommendation: Follow Oregon DOT rules and prepare an IAMP with public input. Honor previous commitments to the community and reduce width of new streets to reduce displacements. Provide community planning and financial assistance to replace lost local retail service businesses.
P-101-004	Hayden Island LRT	The HI LRT Station is now shown as a standard TriMet design

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As with the light rail station, displacements on the island have changed as the designs have advanced. And, when project staff have found access and other impacts to properties, which have as yet unknown ramifications for the businesses, these businesses have been identified as displacements. Thereby, project staff have potentially overestimated the number of displacements, and is eager to work with individual businesses to retain their operations on the island. This is particularly the case for some of the businesses east of the Interstate, where only small portions of the property may need to be acquired.

P-101-002

The Record of Decision is based on Option A. Although Option B was carried into the FEIS, it is not the design that will be constructed. There will be a local multimodal access provided to the island.

P-101-003

Refinements and new information resulted in additional displacements. We do not expect that all the businesses assumed to be displaced will necessarily have to be displaced, but it is prudent to be conservative about impacts in the NEPA process. Also, some of the displacements would be affected only by diminished access, not by demolition. It is possible that some of these properties and buildings could be re-occupied by other businesses that would not be so affected by the changes in access.

As the design is advanced there may be ways to avoid some displacements, through modification of the proposed new streets. However, it is also important to provide new streets that satisfy the City's requirements and those of the Hayden Island Plan. There should be adequate sidewalks, travel lanes, and other elements to the islands new, "complete" streets.

P-101-004	station design Ch. 2 Pg 2-25	without a station shelter. The earlier designs that were developed by the CRC PWG with a renowned consultant and with extensive community input are not included. The elevated HI LRT station is in a cold and windy location and needs a station shelter to protect riders. The station design is supposed to be an attractive focal point for the community and an iconic entry point for Oregon. There is no discussion of local handicapped parking at the LRT station and no mention of planned closure of the existing park and ride at Expo station. Many in the community will be forced to drive to Delta Park to use the LRT because there will be no station parking and no local bus service. There is no discussion of an east-west shuttle bus service to help Island residents get to a LRT station or to any regional bus stop during construction or operation. Recommendation: Reinstate the attractive LRT station designs. Add a handicapped parking lot or a local permit-required parking lot to the HI LRT station for Island residents. Provide east-west shuttle bus service on the Island at least through the construction period.
P-101-005	Location of Stormwater Treatment Facilities on Hayden Island Pg 2-16 and 2-17, various other sections.	Stormwater Treatment Wetlands now occupy the entire site of the future local retail center shown in the HI Island Plan but this is NOT identified as an impact to the community. Also, one of the Treatment Wetlands is located on the Columbia River shoreline in a future shoreline park. Again, this is in conflict with the Island Plan and not identified as a community impact. We have repeatedly asked CRC to move these treatment facilities to comply with the Island Plan. The answer from the CRC has always been don't worry, these locations are only placeholders until we get to design. Now it's design time, the stormwater facilities still violate the Island Plan, and the FEIS says, in effect, don't worry, there are more studies to be done before a final decision. In the mean time, the treatment method has changed from small infiltration basins to treatment wetlands which take up over twice the area of the basins. Once they are memorialized in the FEIR and ROD, what are the chances of a change in treatment method or location? Recommendation: Relocate the Stormwater facilities to avoid violations of the Island Plan. The open areas within the new Marine Drive Interchange appear to be a viable location. On-bridge treatment could significantly reduce the on-shore acreage.

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P-101-004

Please see the response to P-101-001 regarding the Hayden Island Light Rail Station Conceptual Design Report. The Hayden Island Light Rail Design Principles are:

- Create a station environment that is safe, attractive, and inviting for transit users, visitors, and island residents
- Provide circulation paths that allow clear connections to or through the station area for users of all modes with varied abilities
- Develop a station area that embraces and engages its surroundings with transparency and activity
- Design a station that protects transit users from freeway noise and the natural elements, while providing light, views, and clear way-finding
- Design a station that includes features referencing historical or cultural values unique to Hayden Island

CRC is committed to work with the community to advance the station design. Station design work will take place during final design.

The Hayden Island LRT station cross section illustrations in the FEIS shows a conceptual design with place holders for station elements. The illustration shows the Hayden Island LRT station as an elevated station with a center platform. Again, the project will continue to work with the Hayden Island community to refine the station area design.

At the December 2010 PWG meeting, TriMet representatives discussed bus service. TriMet will work closely with the contractors during CRC construction to ensure that Line 6 continues service to Hayden Island. When developing a bus service plan along a new light rail line, TriMet re-evaluates all bus service within the vicinity of the new line with the intention of maximizing ridership and limiting service duplications. As part of this process, TriMet conducts ridership, cost, and operational

P-101-006	Stormwater Treatment Methods and Impacts Ch. 3, Pg. 3- 342 to 3-350	Stormwater Treatment Wetlands on Hayden Island will have adverse impacts on the Island that have not been evaluated. As discussed above, the locations of the constructed wetlands are in direct conflict with the Island Plan but they also significantly increase the footprint of the CRC project. The permanent standing water in the wetlands will undoubtedly create a breeding ground for mosquitoes and the vegetated shorelines may be used by nutria and other nuisance wildlife. Since the wetlands will be trapping contaminants from the stormwater in the sediments and vegetation, I assume the facilities will be closed to the public and may be fenced. They do not seem to be appropriate facilities for a developed urban area. Stormwater entering the treatment wetlands does not fully infiltrate into the groundwater but rather is discharged back to the Columbia River. No information is provided to evaluate the quality of these discharges but it seems obvious that at least the discharge temperature will be elevated and dissolved oxygen will be lowered so the discharge may not meet ambient water quality standards. Other treatment methods are available that could reduce impacts on Hayden Island. Proprietary systems using filtration canisters require much less space and could be located on the bridges or in a below grade structure near the bridge landing. <u>Recommendation:</u> Revise the stormwater treatment facilities to avoid adverse impacts on the Island community.
P-101-007	CRC Impact on HI future parks and shoreline access Ch. 3, Pg. 3-189, 3-207 & 3-208	The future waterfront park areas under the CRC landings that were identified in the Island Plan are not discussed in the FEIS. The CRC project makes no provisions for these public facilities even though the community has repeatedly asked that right-of-way lands under the landings of the existing and new bridges be made available for shoreline access and park use. This failure to provide public access is not identified as an impact on the community and is in violation of the Island Plan. We have repeatedly asked for this CRC project land to be made available for public use. In stark contrast, on the Vancouver side of the river, the CRC project has worked with the City of Vancouver to create park areas at the bridge landing and has indicated they will donate surplus land for park use.

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analyses. TriMet seeks input from the following community groups:

- Customers and operators
- Neighborhood associations
- Business groups
- Social service agencies and organizations serving seniors and people with disabilities
- Citizen advisory committees
- Jurisdictional leaders and staff

The project will work with TriMet and the Hayden Island community to develop a bus service plan during construction and after light rail opens in 2019. A circulator service, perhaps with shuttles, will be developed during the bus service planning public process that will begin two years prior to the start of light rail.

On-street parking is shown in the current roadway designs for Tomahawk Island Drive. The project will work with the City of Portland and the Hayden Island community to refine the parking designations near the LRT station. Delta Park will serve as the nearest park and ride to the Hayden Island light rail station, a distance of 1.17 miles from the Hayden Island light rail station. The distance between the park and ride lots at Expo Center and Delta Park is 0.69 miles.

P-101-005

The stormwater facilities shown in the FEIS will continue to be refined as design work progresses. Under the terms of the biological opinion (BO), the CRC project must treat stormwater runoff using bioretention, bioslopes, infiltration ponds, porous pavement, constructed wetlands, and vegetated and soil amended swales designed for infiltration. Based on the information we have on file, stormwater runoff is currently not treated before being released to North Portland Harbor or the Columbia River.

P-101-007		Recommendation: Provide for public access and park use for the existing and new Columbia River and North Portland Harbor Bridge landing areas. Donate surplus Doubletree property for park use after project construction is completed. This donation would be as partial mitigation for community impacts.
P-101-008	No Mitigation for Community Livability Impacts Chapter 3	The FEIS makes a case that: 1. final design will be consistent with the Island Plan; and 2. The Island will experience only long-term "general" impacts on community livability(What is a general impact???). These claims have not been demonstrated given the facts: ----The island will be cut in half by a very un-neighborly concrete barrier that will extend across the entire island and will be 4-6 stories high and several city blocks wide. This will be a major visual and physical divider of the community---much more-so than the current ground-level freeway. ----The project will displace virtually all of the locally oriented retail businesses with a loss of 643 local jobs. The losses will include the only grocery store providing full service bakery, meat, and fresh produce departments; the only gas station; the car wash, one of the two banks, and virtually all the local restaurants. The FEIS offers only mitigation by buyouts of business owners who can then leave the Island. No mitigation is offered to island residents who have lost a large percentage of their local service businesses, other than a suggestion that we buy a bus ticket to take us off the island for shopping for the next 7-10 years. Similarly, the business owners get a fair market buy-out but their 643 employees get no mitigation other than a suggestion that they might qualify for temporary CRC construction jobs. Some unknown portion of these lost jobs is held by Island residents so they may have to move to find work. -----The project will preclude future development of the neighborhood retail center called for in the Island Plan and appears to deny public use of the state-owned-lands for planned shoreline parks. These were key pieces of the Hayden Island Plan because they provided a basis for local business recovery and long term livability

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The Hayden Island Redevelopment Plan states that runoff from local streets will be treated in roadside planters and that CRC stormwater will be managed in a "green, state-of-the-art manner." Although the Hayden Island Plan map did not show the constructed wetlands, these are a "green" concept for stormwater treatment, and have been shown in project designs as early as May 2009. The stormwater treatment proposed in the FEIS does include the "green streets" approach proposed in the Hayden Island Redevelopment Plan to the extent feasible. This approach to stormwater treatment is not suitable for streets located under bridges (where it will be difficult to establish plants) or where streets are at or below the seasonal high groundwater table. We will continue to review the developing design to determine whether additional streets lend themselves to this method of runoff treatment. Regardless, the project still needs to manage runoff from almost 28 acres of impervious area consisting of I-5 pavement across Hayden island, associated ramps, the elevated transit guideway, and structures.

P-101-006

The Hayden Island Redevelopment Plan map does not show any specific locations to manage and treat stormwater runoff from the CRC project or the impact that it will have on the land available on the island for redevelopment; the Plan simply states that stormwater will be managed in a "green, state-of-the-art manner." The current proposed water quality facilities fulfill that requirement. In addition, care was taken to ensure that the facilities are located on land that is either currently owned by ODOT or would need to be acquired for CRC construction, independent of stormwater management. While wetlands are typically permanent bodies of water, they are not stagnant. Water flows through them during the frequent rainfall events producing conditions that are not conducive to mosquito larval development. As stated above, a constructed wetland is one of the BMPs listed by NMFS in its BO as providing the level of treatment necessary to protect endangered species

P-101-008		improvements. The FEIS doesn't recognize these violations of the Island Plan as impacts so there is no mitigation offered. ----The project will permanently displace numerous floating home residents. The only mitigation offered is a fair market buyout, but the floating homes are unique and moorages for them are not available anywhere else in Oregon. The CRC was asked to mitigate these impacts by assisting in the development of a replacement moorage near-by in the North Portland Harbor area. CRC's FEIS response is that permitting a replacement moorage might be too difficult for them (even though CRC has the resources to permit a $3-4 Billion river crossing?). Recommendation: The FEIS should accurately reflect the real and significant impacts on the Hayden Island Community. The CRC should re-open communications with the Community and work with them to reduce impacts and provide community assistance where major impacts can not be avoided.
P-101-009	Potential Impacts of Project Phasing on Hayden Island Livability.	The FEIS only considers phasing of some SR 500 features and some Marine Drive ramps. Completion of those components has been delayed indefinitely. It seems obvious that delay of full funding may delay construction of some other project components for an indefinite number of years. The community impacts of these likely(?) delays have not been identified or mitigated. What components might be delayed on Hayden Island?—The local multimodal bridge? ---The Tomahawk Island Drive extension under the new freeway?---The entire interchange? Hayden Island will already experience the longest construction impact period of anywhere else in the project area (2+ years of property acquisitions/displacements followed by 5-1/2 years of construction). Any delays by project funding would greatly increase the impacts on livability. Recommendation: Provide assurances that Island components will not be delayed more than any other CRC project components or work with the community to

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found in the Columbia River. As such, the discharges are considered by the agency to meet its stringent requirements. We will be further evaluating the potential for infiltration.

P-101-007

The proposed transfer of 0.4 acre of surplus right of way to the City of Vancouver is mitigation for the project's direct impact on the City's Waterfront Park, an existing public park and a Section 4(f) resource. The project has no impact to public parks on Hayden Island and no land that is subject to Section 4(f) protection, and therefore no need for such mitigation. The CRC project does not currently propose to convert the existing Thunderbird site on Hayden Island into a public park, but it also does not preclude it from becoming a public park in the future. Decisions regarding the disposal of surplus property after project construction will be made at a later date. The City of Portland has also noted their interest in that parcel following construction and the project has committed to continue coordinating with them on it.

P-101-008

Project refinements and new information resulted in additional displacements since the early planning phases of the project. We do not expect that all the businesses assumed to be displaced will necessarily have to be displaced, but it is prudent to be conservative about impacts in the NEPA process. Also, some of the displacements would be affected only by diminished access, not by demolition. It is possible that some of these properties and buildings could be re-occupied by other businesses that would not be so affected by the changes in access.

The character of central Hayden Island is changing, and the project will contribute to further changes. The project is consistent with the direction embodied in the Hayden Island Plan. The multi-million dollar improvements that result from the project will help facilitate redevelopment on the island. The redeveloped commercial areas will, if

P-101-009		develop contingency plans and mitigation measures.
P-101-010	Transportation Impacts on Hayden Island during Construction Ch. 3 Transportation	The FEIS discusses impacts and mitigation for pedestrians, bicycles, handicap scooters and other non-vehicle movements in a north-south direction along the freeway corridor but not in an east-west direction across the corridor. East-west movements are particularly important on Hayden Island because there in no way around the project construction area. Also, there are no existing adequately sized or safe sidewalks, bike lanes or ADA-compliant pathways across the existing freeway so temporary facilities will have to be built before any construction can begin on the Island. <u>Recommendation:</u> Work with the Island community to plan and construct safe non-motorized crossings for east-west movements, as well as north-south movements during construct. Implement an east-west shuttle bus service on the Island to minimize risks to Island residents trying to cross the freeway construction zone.

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consistent with the Hayden Island Plan, better serve local residents than the regional commercial/ big-box uses there now.

P-101-009

The project will seek funding for the construction of the LPA in its entirety. And although there are limited funding opportunities and limited available funding, this project is recognized by our federal partners as having national significance. We are optimistic that being designated one of a few Corridors of the Future will assist us in obtaining the necessary funding.

The project will be built in stages. These stages will be dictated by the variety of contracting mechanisms that will be used, the in water work window, and available funding. Chapter 2 of the FEIS shows how the work will most likely progress. In the event that portions of the project need to be phased, the decision on which portions would include public input and a formalized process. NEPA allows for a sequenced progression of construction. However, if portions of the project were to be significantly delayed, NEPA reevaluations would likely be required.

P-101-010

The project will be developing a shuttle bus system to mitigate mobility impacts on the Island during construction. There will also be plans to protect east-west mobility on the Island during construction for vehicles, bikes, and pedestrians.

P-101-011

FEIS does not meet NEPA requirements for evaluation of bridge type alternatives Appendix O	The CRC hired a panel of internationally renowned bridge architects and engineers to develop new bridge type alternatives to replace the non-viable bridge type that had been the LPA for several years. The panel developed three alternatives including two that exceeded the previously used bridge height criteria. After reviewing the height criteria, the expert panel concluded the taller structures could be permitted and constructed. The three alternatives were then presented in public meetings, discussed in the press, and discussed extensively among public stakeholder groups, politicians, and the CRC. At some point, the CRC terminated their evaluation and selected their own version of the deck truss bridge type without revealing their decision to the public. The CRC deck truss version was curved while the expert panel's version was straight. As a result, the CRC deck truss version has more bridge piers in the Columbia River than any of the panel's three alternatives and the CRC's version is the only option that impacts the environmentally sensitive shallow water habitat on both shorelines. This process was flawed for several reasons: --The CRC did not do an adequate NEPA-based evaluation of the alternatives and did not include their selected design in the evaluations. --The FEIS does not include documentation of the bridge-type alternatives and their environmental or economic comparisons. --The DEIS and FEIS continue to rely on a flawed height criteria decision made in 2006, before the DEIS, that eliminated tall cable-stayed, suspension, and steel bridge types that are commonly used throughout the country. It appears that a major reason for the height criteria was for the convenience of the CRC so they could avoid FAA permitting relative to Pearson Airfield. Pearson Airfield officials and the Pilot Organization that uses the Airfield have recently said that a tall bridge would not be a major issue for them because they have an agreement with Portland International Airport that prevents them from flying over the River where they could interfere with aircraft using PDX. Thus, they don't fly over or near the I-5 Bridge. --While the public discussions of the panel's alternatives were going on, the CRC asked the FTA and FHWA if the CRC's change to a curved deck truss would require a

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P-101-011

Many basic bridge concepts (low, medium and high) as well as tunnels, were considered in the early alternatives analysis prior to the DEIS. A medium level, fixed span bridge emerged as the best choice for meeting the purpose and need and minimizing impacts and costs, and that was carried forward into the DEIS, as discussed in Chapter 2 of the FEIS. The DEIS did not define a specific bridge type; it evaluated bridge-related impacts based on a definition of vertical clearances above and below it, horizontal alignment, capacity, and a pier configuration concept. This allowed for multiple types of bridges, including the open web box that emerged through the UDAG group sessions and the composite deck truss that eventually became the preferred type following the Bridge Expert Review Panel (BERP) proceedings and the decisions by both governors.

FHWA and FTA were fully aware of the BERP activities and report. An FHWA engineer was among the members of the BERP. The straight alignments were straight across most of the water but had curves at either end to reconnect with the I-5 alignment. While the straight alignments were originally believed to have potentially lower costs and possibly fewer piers, it was clear after further analysis that this would not be the case. The straight alignment would not be expected to reduce costs or environmental impacts. The BERP report recommended that the project adopt any one of three bridge types. One of those types (composite deck truss) was selected, with a curved alignment across the river. This bridge type was selected because it met the purpose and need, would have lower environmental impacts, and would likely be lower cost and carry less risk than the other bridge types recommended by the BERP.

See the discussion of the Bridge Review Panel, evaluation of bridge types and final bridge type recommendation on pages 2-80 and 2-81 of the FEIS.

P-101-011

	Supplemental EIS. Their written submittal did not mention that there were other new bridge types being considered and that some of those alternatives might have less impact on key environmental resources. Comparing only the CRC's curved deck truss with the curved LPA, the Agencies concluded that the change in bridge type would not require a Supplemental EIS. The CRC then justified their selection based on their statement that it was the only option that would not require a Supplemental EIS. Of course, the Agencies did not receive information about the other alternatives so it was not appropriate for the CRC to conclude that they would all require Supplemental EIS's. Furthermore, the CRC did not ask the Agencies a more critical question----did the CRC's decision to use their own secret curved deck truss design without a full environmental comparison or public review of the panel's three alternatives meet NEPA requirements or did that decision require Supplemental EIS review? I believe the CRC erred and did not meet NEPA requirements for consideration of alternatives that may have fewer environmental impacts. <u>Recommendation:</u> Correct the FEIS or begin preparation of a Supplemental EIS to reconsider the bridge type decision after the ROD.

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Hines, Maurice

From: Mike Wentzel [ml-wentzel@comcast.net]
Sent: Monday, October 24, 2011 8:48 PM
To: Columbia River Crossing
Subject: The CRC project

P-102-001

I have said over and over again that the citizens of Vancouver should have the right to vote this boondoggle down. We don't want light rail, we don't need a replacement bridge that does nothing for transportation there still is congestion in the rose quarter and north of there. It does nothing except to help a few local commuters from Vancouver to Jantzen beach and back.

It doesn't take a rocket science to figure that one out. Please do the right thing stop this project before we waste the est. 10b dollars for the project.!!!!

Sent from Mike's iPhone

1

P-102-001

There will not be a public vote on construction of the various CRC project elements. However, as a public project, it must be approved and funded by the decisions of elected officials who are themselves directly elected by voters. Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on pursuing a public vote.

Hines, Maurice

From: Pressentin, Anne
Sent: Tuesday, October 25, 2011 5:18 PM
To: Columbia River Crossing; Wills, Heather
Cc: Chisholm, Derek; Harrison, Michael
Subject: Verbal comment from James Marsh

On Monday, Oct. 24, 2011, I received the following comment from James Marsh. I also spoke with him on Oct. 5, 2011. This is a summary of his comments.

Contact information:
James Marsh
2380 NW Hummingbird Drive
Corvallis, OR 97330
Phone: 541-738-0377
(No easy access to web.)

P-103-001 Mr. Marsh said the Hayden Island interchange was designed to provide instant gratification to people who want to get anywhere at 80 mph. He said people should be told to slow down and to reduce the speed limit to 40 mph or even install a stop light at the interchange. He said the current design is luxurious. CRC is trying to cram too much in too small a space. He said planners should "get real and tone it down." It's unfortunate that there are displacements, he said. When the Port of Portland property on West Hayden Island is developed there will be boatloads of trucks. He said a Hayden Island interchange may not be necessary.

P-103-002 Mr. Marsh's previous comments on Oct. 5 centered around the cost to date and called the $100 million expended a "double cross." He said don't build access to Hayden Island and that the Port should be responsible for providing access to West Hayden Island. He questioned the justification for a 450 wide interchange with 18 to 21 lanes that wipes out businesses. He said just put in light rail from Corvallis to Portland. It would be easier to maintain than high speed rail, he said.

Follow up:
Send project area map and fact sheets (completed on Oct. 6, 2011)
Confirm that he is on the project mailing list.

Let me know if you have questions.

Anne Pressentin | **Communications and Public Outreach**

Columbia River Crossing Project | pressentina@columbiarivercrossing.org
700 Washington St. Suite 300, Vancouver, WA 98660
office: 360.816.2161 | 503.256.2726 x2161

P-103-001

The design speed of the bridge is 60 mph transitioning to 70 mph slightly south of the bridge; the posted speed is expected to be 60 mph or less. A stop light on Interstate 5 would be inappropriate and unsafe. The proposed West Hayden Island development would not be expected to eliminate the need for a Hayden Island interchange.

P-103-002

By 2030, the region's population is expected to increase by one million people. This increase will result in more people needing to travel between home, work, school, recreation, etc. In 2005, 135,000 vehicles crossed the Columbia River on the Interstate Bridge, which led to 4-6 hours of congestion each weekday. By 2030, 184,000 vehicles are predicted to cross the river annually, which would lead to 15 hours of daily congestion if no action is taken. And while the project will encourage light rail ridership, light rain on its own will not meet the project's purpose and need.

Congestion occurs when vehicle demand is greater than a transportation system's capacity. It results in slower speeds and increased travel times. CRC defines congestion as vehicles traveling less than 30 mph. The Columbia River Crossing project uses information gathered from Metro's nationally-recognized travel demand models to determine the project's effect on congestion. These models predict trip frequency, types or modes of transportation, destination, and time of day. Transportation planners use these models to analyze the effects of such factors as increased population and employment, transportation improvements, and new developments on the transportation system.

Based on the Metro model's past ability to predict transportation effects, the CRC project is confident in the data received from Metro and uses it to determine what impact the project will have on congestion. The improvements proposed by the project to the highway and the

Hayden Island interchange will help better accommodate increased future vehicle traffic. New auxiliary lanes and longer on/off ramps will allow safer and more efficient merging and weaving when entering or exiting the freeway. Narrow lanes and shoulders will be widened to current standards. Shoulders will be added where they are currently missing. All of these changes will improve the flow of traffic in the bottleneck area of the Interstate Bridge.

Hines, Maurice

From: Harbor Walter [walter@harbor-properties.com]
Sent: Wednesday, October 26, 2011 8:36 AM
To: Boyd, Nancy; Strickler, Kris; McCaig, Patricia; Garrett, Matt; Hammond, Paula; McFarlane, Neil; Hewitt, Henry; Horenstein, Steve; Oldfield, Meghan; Liles, Casey; Witter, Steven; Wagner, Don
Subject: CRC - Portland Impacted Neighborhoods FEIS Comments
Attachments: CRC-Portland Impacted Neighborhoods FEIS Comments.pdf; ATT14091882.htm

Message from the Portland Neighborhoods to the Leader of our Region about the CRC

To: Ginny Burdick <sen.ginnyburdick@state.or.us>, Tobias Read <rep.tobiasread@state.or.us>, Matt Wand <rep.mattwand@state.or.us>, Chuck Thomsen <sen.chuckthomsen@state.or.us>, Nancy Nathanson <rep.nancynathanson@state.or.us>, Lew Fredrick <rep.lewfrederick@state.or.us>, Lee Beyer <sen.leebeyer@state.or.us>, Cliff Bentz <rep.cliffbentz@state.or.us>, Margaret Doherty <rep.margaretdoherty@state.or.us>, Katie Brewer <rep.katieeyrebrewer@state.or.us>, Frank Morse <sen.frankmorse@state.or.us>
Subject: CRC - Portland Impacted Neighborhoods FEIS Comments

To the Legislative Oversight Committee for the Columbia River Crossing Project

P-104-001

This is the set of FEIS comments from the Portland Neighborhoods *directly impacted* by the Columbia River Crossing.

If you only have a little time - please read the first page of this document.
It provides the overview of our comments.

For those who want to get into specific details -
please read of the letters from each of the neighborhood associations
and each of the citizens who have taken time and care to review and comment on the FEIS for the CRC.

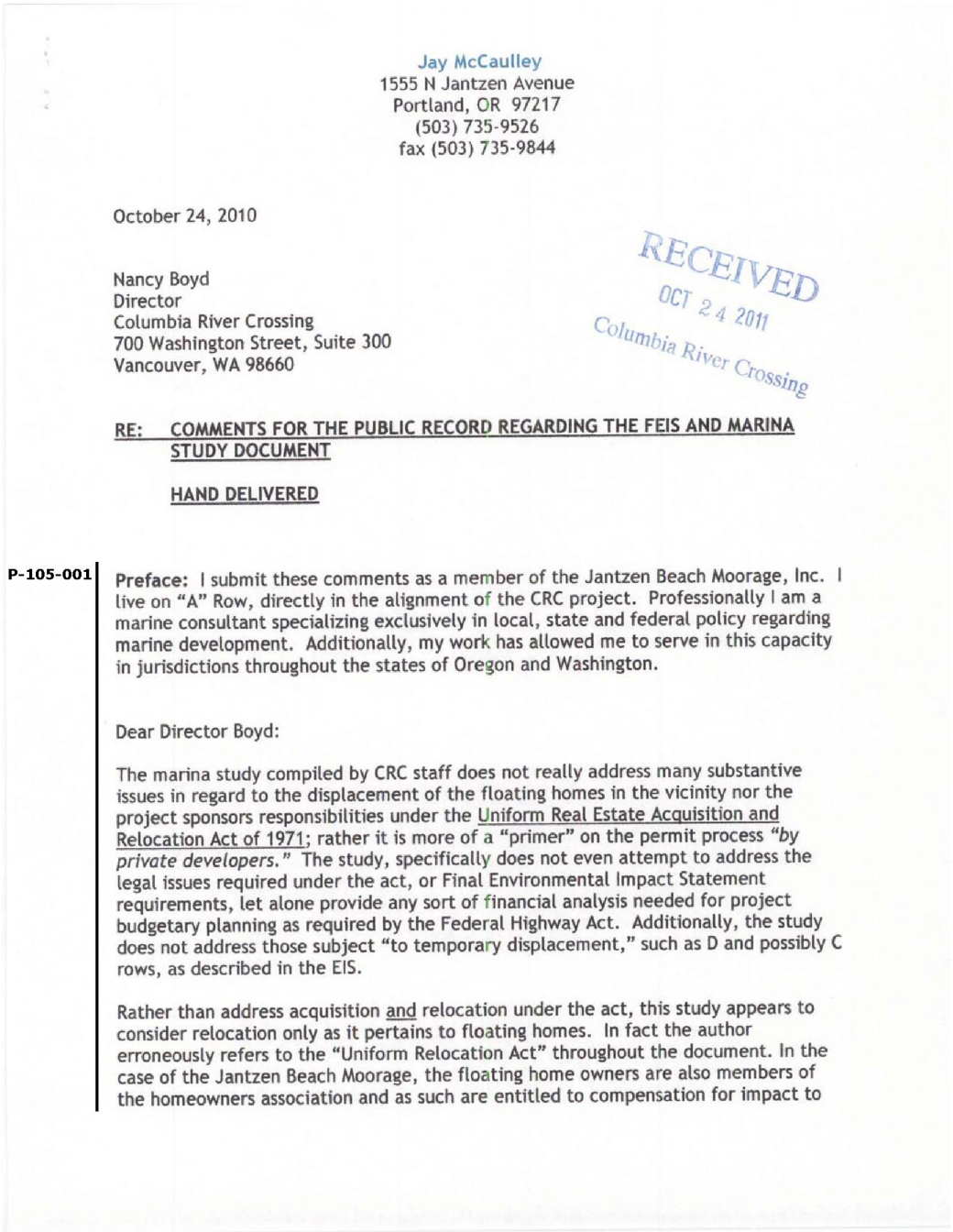
Respectfully,

Submitted for the Citizens of Hayden Island, Bridgeton and East Columbia Neighborhoods
by Walter Valenta 503-880-0181

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

P-104-001

Project staff have read and reviewed the entirety of every comment submitted on the FEIS, including the comments forwarded by Mr. Valenta. The comments forwarded by Mr. Valenta and the responses to them are included as their own individual items within this folder.



Jay McCaulley
1555 N Jantzen Avenue
Portland, OR 97217
(503) 735-9526
fax (503) 735-9844

October 24, 2010

RECEIVED
OCT 24 2011
Columbia River Crossing

Nancy Boyd
Director
Columbia River Crossing
700 Washington Street, Suite 300
Vancouver, WA 98660

RE: COMMENTS FOR THE PUBLIC RECORD REGARDING THE FEIS AND MARINA STUDY DOCUMENT

HAND DELIVERED

P-105-001

Preface: I submit these comments as a member of the Jantzen Beach Moorage, Inc. I live on "A" Row, directly in the alignment of the CRC project. Professionally I am a marine consultant specializing exclusively in local, state and federal policy regarding marine development. Additionally, my work has allowed me to serve in this capacity in jurisdictions throughout the states of Oregon and Washington.

Dear Director Boyd:

The marina study compiled by CRC staff does not really address many substantive issues in regard to the displacement of the floating homes in the vicinity nor the project sponsors responsibilities under the Uniform Real Estate Acquisition and Relocation Act of 1971; rather it is more of a "primer" on the permit process *"by private developers."* The study, specifically does not even attempt to address the legal issues required under the act, or Final Environmental Impact Statement requirements, let alone provide any sort of financial analysis needed for project budgetary planning as required by the Federal Highway Act. Additionally, the study does not address those subject "to temporary displacement," such as D and possibly C rows, as described in the EIS.

Rather than address acquisition and relocation under the act, this study appears to consider relocation only as it pertains to floating homes. In fact the author erroneously refers to the "Uniform Relocation Act" throughout the document. In the case of the Jantzen Beach Moorage, the floating home owners are also members of the homeowners association and as such are entitled to compensation for impact to

P-105-001

Mr. McCaulley has provided an assessment of the project's Marina Study, conducted to assess the likelihood of a new marina being developed in time to aid in the relocation of displaced floating homes. The main purpose of the Marina Study was to compile information and study issues related to the establishment of new marinas or additional slips by private developers. The project maintains that it is unlikely there would be significant development of additional marinas or floating home slips in the foreseeable future and especially in the 12 to 18 month window when the project is likely to displace the floating homes.

Although Mr. McCaulley has suggested that permitting for a new marina could take place within a single year, the project's estimation also included time for the preparation of the plans and studies required for permit applications, and have estimated that potentially four years would be needed for permitting, feasibility studies, financing, bidding and construction. Mr. McCauley's critique points out several items he believes are factual errors or errors of interpretation. The project acknowledges Mr. McCauley's authority on these matters and will make the factual corrections he suggests. However, the basic conclusion remains the same - it is unlikely that a developer would be able to design, develop, permit and construct a marina, even with the support of coordinated agencies, in time to provide slips for displaced floating homes.

The marina study was not intended to address compensation and relocation benefits provided for by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 U.S.C. 4601 et seq.) (Uniform Act).

As stated in the Final Environmental Impact Statement (FEIS), all property owners will be offered Just Compensation for any ownership interests in parcels acquired for the project; and displaced occupants of

P-105-001

their portion of the DSL leasehold interest and moorage infrastructure, including docks, pilings, common areas and upland.

Interestingly, this report was referred to in the FEIS at Chapter 3.81-82, but not included in FEIS list of study documents as an appendix to the FEIS, nor was the author listed in appendix H, list of preparers. Additionally, the study is not published on the CRC web-site

The stated purpose of the study was:

> *This memorandum compiles information regarding requirements and issues related to the establishment of new floating home marinas in the Portland area by private developers.*
>
> *"Marina development is totally a private entrepreneurial effort by individuals or corporations interested in developing a property for profit."*

Given this limited assumption, it is not surprising that they conclude in the FEIS Acquisition Section (Chapter 3) that:

> *"(T)he project is not pursing(sic) the construction of a new floating home marina."*

However, with this said, the report admits that it may not meet legal scrutiny as a result.

> *This memo does not address the legal issues related to the relocation of floating homes by the Columbia River Crossing project under the Uniform Relocation Act.*

This fundamental issue is troublesome in that the purpose of the FEIS and Environmental Justice process, as well as the Uniform Act are clearly required to vet such issues. In short, their role is not to look at this from the standpoint of a "*private entrepreneurial effort... for profit;*" their role is to fulfill their legal responsibilities and adhere to the regulations in favor of those impacted by this government project, under eminent domain, for valid public purposes.

It is also interesting to note that the alternative site analysis did not include any government owned property or actual study of integration of the displacements into existing moorages. In North Portland Harbor roughly half of the upland property is owned by the Port Of Portland or Metro (considering West Hayden Island and the area along Marine Drive). While I am not suggesting that looking at relocation to theses sites is something that the displaced homes or Janzen Beach Moorage would be interested in or would even consider to be desirable; I do believe that the study is incomplete because they were not considered and therefore does not fulfill the requirements for moving forward under the Congressional Acts mention above.

said parcels will be offered all relocation benefits for which they are entitled under the Uniform Act.

Floating homes will be treated as real property unless it is determined there are sufficient replacement sites to which the floating homes can be economically relocated. If a Relocation Study determines that sufficient replacement sites are not available, the floating homes will be purchased at fair market value and the occupants will be provided relocation assistance which may include payments, if necessary, to acquire decent, safe and sanitary replacement housing.

P-105-001

For example, during the late 1990's, the open space opposite JBMI on the mainland side (across Marine Drive from EXPO) was successfully leased by Metro (a project sponsor) to a private developer for development of a marina indicating that it could be, and certainly should be considered as a potential site. Additionally, the Port of Portland faced similar circumstances when they undertook their runway realignment project; specifically relocation or demolition of floating homes under eminent domain based on federal transportation regulations. This effort resulted in agreeing to build the Islands Moorage rather than opt for demolition. Based on the zoning of Port property on North Portland Harbor, there are no justifiable reasons for not considering relocation of the displaced floating homes to portions of their vacant land, especially as they are just now considering development options for significant areas on West Hayden Island.

For the purposes of this analysis I have followed the author's format. The italicized sections are taken directly from the study.

I. THE MARINA DEVELOPMENT PROCESS:

The study author stresses the difficulties of marine development. JBMI can attest to some of the difficulties obtaining permits based on our own construction projects over the recent past.

> *Marina development is totally a private entrepreneurial effort by individuals or corporations interested in developing a property for profit. There are no known incentives or subsidies for developing a floating home marina. Developer's primary interest is making a profit for their efforts; a profit from the sale or rental of developed slips significant enough to reward the principals in the development for the work and capital investment over a number of years before profits can be realized.*
>
> *The development process is complicated and subject to protracted delay as the many agencies consider the submitted development plans and environmental material. It is estimated it would take a minimum of four years to advance a project through permitting to completion when it is ready for occupancy.*

Having specialized in marine development permitting throughout my professional career, I believe I am in a position to say that the author has not considered many reasons for engaging in such a difficult task in both the public and private sectors; "*...totally a private entrepreneurial effort by individuals or corporations interested in developing a property for profit.*" Several moorages in the Portland area, including Jantzen Beach Moorage Inc. are owned by not-for-profit home owner associations, and further, many marinas in Oregon and Washington are publicly owned.

As described above, the Port of Portland found with their runway realignment project that building a new moorage suited their purposes based on feasibility and they constructed the Islands Moorage. While we do not disagree with the finding that marine development can be difficult and time consuming; as a consultant exclusively permitting

P-105-001

such projects in many jurisdictions; public marine projects, although subject to the same regulations as a private developer would face have several advantages when undertaking such.

While I can cite cases where private sector projects have taken as long as four years to permit and develop, in my experience this would be rather unusual depending on the jurisdiction. Most projects can be permitted in about one year. It would be highly unusual for a public project to take nearly that long, especially considering the significance and magnitude of the CRC project as the driving force. The author does not provide documentation as to the "estimated" minimum four years to advance a project of this nature. I will detail some of the expected time-lines for permitting in the next section.

In this case, the cause for displacement is based solely on a substantial "public need" of regional, interstate, and national significance that the permitting agencies certainly consider when evaluating an application, especially from a sister agency. Also in this case, the project has garnered the full political and professional support from the local project partners (local jurisdictions), Oregon and Washington States, the respective Departments of Transportation, including in-house professional staff from both agencies, as well as consulting teams from several disciplines, significant funding, and strong, well publicized support from both Governors.

If the scope of the study even considered the public nature of the project and the fact that the CRC project must adhere to the legal issues of eminent domain as a result, the study findings would properly be found to be significantly different than described. Certainly, building a freeway bridge over the Columbia River between Oregon and Washington, through several jurisdictions and layers of agency review, can not be less daunting of an undertaking, as this study implies, than permitting and construction of a moorage for those that will be displaced, or even considering, as required, by state and federal policy, alternative sites and proper analysis.

II. THE PERMITTING PROCESS:

One of the first steps in commencement of the permitting process would be a consultation with DSL and the Corps. DSL and the Corps have a joint permit application process. A pre-application meeting will be arranged with the applicant's consultants and agency technical staff, biologists and others to assist the applicant in determining the plans and reports that will be needed in considering the effects of the project and any limitations and requirements that may be needed for approval. The following are the primary players in the permitting process:

> *At statehood in 1859, the federal government gave Oregon the ownership of submerged and submersible land underlying navigable waterways... The State Land Board is charged with managing this land on behalf of all Oregonians. The Department of State Lands (DSL), the Land*

P-105-001

Board's administrative arm, is responsible for the day-to-day management of these publicly owned resources.

Application for DSL leases: *Any new use of submerged lands under DSL jurisdiction requires a lease. The DSL's application requires an application form accompanied by detailed maps and plans for the proposed facility. DSL staff distributes the application and the plans to a mailing list which includes nearby owners, municipal jurisdictions, and resource agencies. DSL staff receives comments on the proposed project and refers any objections it deems substantive to the applicant for resolution. It is up to the applicant to resolve issues raised in the comment period. If the applicant is unable to resolve issues deemed substantive by DSL, it may not be approved.*

In addition to the recipients listed above several private individuals and organizations are included on DSL's mailing list, specifically tribes and environmental groups who routinely weigh-in on project proposals. DSL weighs the nature of the comments, as well as who is making the comments prior to moving forward with their decision to issue a lease or not. For example, comments from the Oregon Department of Fish and Wildlife tend to carry more weight than comments from certain organizations that appear to oppose every project as a matter of routine. DSL exercises significant discretion when considering each comment. While they indeed may not issue a lease based on a comment, they are typically not obligated to resolve or condition approval in every case, nor is the applicant.

The proceeds from the Waterway Leasing Program inure to the Common School Trust Fund for distribution to school districts throughout the state. With this in mind, DSL weighs the principles of "sound management" of the natural resources of the State, as well as their contribution to schools when making their decision as to issuance or not. Given these circumstance, leases are generally issued unless the project plan is found to be significantly flawed or detrimental to our environmental policies. Most planning consultants in the public and private sectors are well versed in what will work and what will not work when designing a project for DSL scrutiny. In short is relatively rare for DSL to simply deny a lease authorization as implied.

Once an application is deemed complete, usually within 30 days, the DSL puts the application out for the 30 day comment period. DSL at that time can issue a lease or provide conditions for approval or deny the application. Typically a lease is issued in 4 to 6 months.

Leasing Procedures: *All moorages, marinas and docks in this area are subject to DSL administrative rules and must be leased from DSL. DSL will not approve a lease until it is satisfied that all applicable rules and permits have been issued. A commercial marina may select one of three ways of determining their annual rent:*

P-105-001

Interestingly, not all moorage projects require a DSL lease as stated and quite specifically in the North Portland Harbor area. At the time of statehood, the "Oregon Slough" as it was known then did not go all the way through in many water conditions. An act of Congress in 1912 authorized the Corps of Engineers to dredge a commercial channel so the entire length of Hayden Island could be utilized for marine transportation. Therefore, much of the east end of the Hayden Island channel bed is fee title property, not subject to DSL lease; rather it is owned by the riparian owners along the shoreline and along Bridgeton Road.

Area "D" described later in the CRC study as *"the most likely site on the river for development of a new marina"* is one of these properties not subject to DSL lease.

There are also categorical exemptions pursuant to DSL Waterway Leasing Administrative Rules such as private wharves and certain government facilities.

As mentioned above, the reviewing agencies including DSL, naturally tend to consider projects presented to them by another government agency with some degree of deference; in addition ODOT has full time professional staff assigned to liaise exclusively with DSL on ODOT projects (I applied for the position at the time it was first offered). Based on my experience, I could not anticipate a situation where DSL would deny authorization to ODOT for construction of a floating home moorage to replace those displaced by the CRC project. Further DSL reports directly to the Land Board, made up by the Governor, Secretary of State and State Treasurer; all of whom have announced publicly, strong support for the CRC project. I can not imagine a scenario where DSL staff would consider "bucking' the Land Board by denying a lease to the CRC should the project determine that a replacement moorage was an alternative to displacement.... It would probably be approved in record time.

> ***B. Corps of Engineers:*** *The DSL application is a joint application with the Corps, which is responsible for permitting construction and dredging in public waterways, such as the Columbia River. It is the Corps' responsibility to:*
>
> > *evaluate permit applications for proposed activities in waters of the United States (including wetlands) throughout Oregon, under the authorities of the Marine Protection, Research and Sanctuaries Act, Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.*
>
> *In evaluating an application, the Corps requests a biological opinion (BO) from the National Marine Fisheries Service (NMFS). The BO contains an assessment of the potential impact of the construction and operation of an in-water facility to fish species and to critical fish habitat. If it is determined that the project impacts are acceptable, the BO will contain terms and conditions that are deemed necessary to minimize the potential harm to protected species. These conditions can include restrictions on in-water work, specific construction techniques and construction materials. NMFS requires that the*

P-105-001

Corps include these restrictions in their permits and that the project be monitored to assure the permittee complies.

A review of NMFS biological opinions (BO) over the last nine years for the Columbia and Willamette River systems, for Oregon and Washington shows there have not been any opinions issued on floating home marinas. So it is difficult to judge current agency opinion. However, BO's for other in-water installations, such as boat docks, highlight agency concern regarding over-water shading. Below are excerpts from a relatively recent BO.

> *Light plays an important role in defense from predation. Prey species are better able to see predators under high light intensity, thus providing the prey species with an advantage...*
>
> *An effect of over-water structures is the creation of a light/dark interface that allows ambush predators to remain in a darkened area (barely visible to prey) and watch for prey to swim by against a bright background (high visibility). Prey species moving around the structure are unable to see predators in the dark area under the structure and are more susceptible to predation. The incorporation of grating into all of the docks allows for more light penetration and diffuses the light/dark interface. This will minimize the susceptibility of juvenile salmonids to piscivorous predation resulting from this project.*

Shading is a permanent effect that could not be readily mitigated for a floating home marina. A minimum size floating home marina of about 40 homes would create about an acre of shade. Unlike other overwater features, it would not be possible to add transparent or translucent features to a house that would alleviate shading. Floating docks can utilize metal grating and boat houses can have translucent roof panels and doors to transmit light, but floating homes do not have the same opportunities. There is no certainty how NMFS would consider the issue, and whether there could be acceptable mitigation. Conversations with marina developers indicate the shading issue is known to developers and creates investment uncertainty, a significant issue.

Over the past few years the Corps of Engineers review process has probably become the most time consuming aspect of permitting, to a large degree because of the required consultation with Nation Marine Fisheries.

Contrary to the author's assertion however, and contradicted by his own foot notes and comments, several biological opinions have been conducted for floating home moorages in the past 9 years; some very recently and some in the immediate area of North Portland Harbor. For example, his foot note on page 3 of the report.

P-105-001

5 NMFS Biological Opinion for Hayden Island Marina. 2004. https://pcts.nmfs.noaa.gov/pls/pctspub/sxn7.pcts_upload.download?p_file=F31284/ 200300787_Hayden_Island_final_1-23-2004.pdf. Page 10-11. Retrieved 1/31/2011.

The Rocky Point Marina expansion approved earlier this year and mentioned on page 5 of the report, required consultation and a biological opinion, as did the reconstruction of the Jantzen Beach Moorage, to name a few. Even modest modifications to existing structures can cause a need for such consultations; as such, these considerations are a routine component of every marine project.

With this said however, NMFS has several avenues to pursue regarding mitigation and minimizing impacts, typically included in the conditions of approval. Light penetration is only one consideration of many that we integrate into every project proposal. Mitigation also comes in many appropriate forms depending on the nature of the impact.

Acceptable forms of mitigation used in circumstances such as described when an impact can not be avoided is on-sit or off-sit habitat creation and enhancement, payment in-lieu of mitigation, as well as other conditions of approval NMFS deems appropriate.

> *Shading is a permanent effect that could not be readily mitigated for a floating home marina... ...There is no certainty how NMFS would consider the issue, and whether there could be acceptable mitigation.*

While every project consultation is analyzed on its own merits, NMFS is quite knowledgeable in minimizing impacts and has made no secret of what they expect and methods to limit impacts to acceptable levels. They have published dozens of BO's, as well as study and guidance documents providing industry professionals with appropriate methods for project design and engineering to minimize, mitigate or avoid adverse impacts. The author is simply wrong when he says "(t)*here is no certainty how NMFS would consider the issue, and whether there could be acceptable mitigation.*"

Further, in my experience NMFS also considers existing structures differently than new construction and reconstruction, again depending on the nature of the impact. For example, a recent client wanted to install a new dock in a location that did not have a dock; he purchased an existing concrete dock section that could not effectively be retro-fitted with light penetrating panels for installation at the new site (specifically in an are deemed to be essential habitat, an even higher hurdle, unlike this portion of the Columbia River and North Portland Harbor). NMFS found that because it was an existing structure, and that there would be no net increase in surface area or shading, the impact was "de minimis" and no further mitigations was required.

P-105-001

In this particular case (CRC), the displaced floating homes and moorage infrastructure already exist. Whether relocated, rebuilt or reconfigured, the net surface area impacted would not change appreciably, if at all. While consultation and BI-OP would still be required; a new, relocated or reconfigured moorage is without a doubt more feasible than indicated by the study.

These considerations are at the very heart of the FEIS and NEPA process. CRC project staff are certainly well aware of these issues and nuances in-that the bridge project faces exactly the same considerations, however on a much larger scale and significantly greater impact. As such, I believe the FEIS fails to meet the minimum threshold for moving forward toward acceptance based on the Uniform Real Estate Acquisition and Relocation Act.

III. ZONING

Zoning is an important factor in determining the feasibility of a potential floating home marina development. There are four jurisdictions on the Columbia which determine allowable land use: the City of Portland, Multnomah County, the City of Gresham, and the City of Fairview. The City of Portland has jurisdiction upstream from the mouth of the Willamette River, past Hayden Island to about 185th Drive.
Upstream from that point there is approx. one mile of Columbia River frontage in the City limits of Gresham. The next 1.5 miles is in the City of Fairview, and the final stretch, to a point near the Sandy River, lies within Multnomah County. The Columbia River downstream from the mouth of the Willamette, as well as the Multnomah Channel, are in Multnomah County jurisdiction.

A. City of Portland:

All of the North Portland Harbor and most of the existing marinas are within the City limits. Except for a few small areas, Portland's zoning along the Columbia River frontage is industrial and commercial. The commercial zone is along Hayden Island, on the north side of North Portland Harbor. The industrial zone extends along the south bank of the Columbia from the mouth of the Willamette upstream to the city limits, approximately at 185th Drive. In addition, there are three overlay zones that restrict uses along the Columbia River, a conservation overlay and two airport related overlays. Those portions of the riverfront that are in public ownership are zoned for open space.

Several of these statements are in error. The northwestern half of North Portland Harbor is not within the City of Portland city limits, the entire western half of Hayden Island is within the jurisdiction of Multnomah County and zoned MUA-20, not industrial or commercial or open space as stated. MUA-20 zoning specifically lists floating home moorages as a conditional use. On Portland maps the Port of Portland property is listed as residential-farming.

P-105-001

Significantly, none of the North Portland Harbor riverfront property "in public ownership" is zoned for open space except one very small park west of I-5 on Hayden Island (Lotus Isle), adjacent to a house boat moorage. In fact, the park is the riparian upland lot. Further, the park's shoreline walkway bisects the entrance to the moorage from the upland parking area for the moorage.

> ***Floating Structures in the Zoning Code**: The City of Portland Zoning Code, Chapter 33.236, Floating Structures, addresses the requirements for floating homes and marinas. "This chapter adapts the existing upland regulations for use with floating structures." This chapter specifies that "All uses in floating structures must be an allowed use on the upland lot they are attached to and must comply with all use regulations applying to the upland lot." Also, a houseboat moorage is considered a multi-dwelling use, so a houseboat moorage would only be allowed where multi-family is permitted.*
>
> ***Summary of Applicable Zoning Codes**:*
> ***CGhcx**. This general commercial code allows houseboat moorages as a permitted use.*
>
> ***IG**. This industrial general zone also allows multi-dwelling uses, which includes houseboat moorages.*

The study is a bit misleading in that the zoning regulations in the area in question are not limited to multi-dwelling use zones only. Plainly put; floating home moorages are allowed in all of the zones in question. While "house boat moorages" are indeed considered a multi-dwelling use, they are also designated as a commercial uses and allowed in the IG2 zone as well.

> ***c = Environmental Conservation zone**. For proposed developments that do not meet all standards for this zone, an environmental review is required and a mitigation plan must be submitted which shows that "all significant detrimental impacts on resources and functional values will be compensated for." The mitigation plan must also demonstrate there is a public need for the proposed use or development.*

Almost by definition; the cause for displacement of the floating homes is based solely on a substantial "public need" of regional, interstate, and national significance. As one of the local partner jurisdictions, the City of Portland understands the significance of this project and that public need.

With this said the "c" zone review is not an impediment to development of a floating home moorage, rather it is a guideline used throughout the design and engineering process to assure compliance and responsible development. All considerations of the code section can be met and/or *"all significant detrimental impacts on resources and functional values will be compensated for."*

P-105-001

h = Aircraft Landing zone. *This zone limits construction height to avoid conflicts with the nearby Portland Airport. However, floating homes are well below the effects of any height restriction and would not be affected by this zone.*

This is not an issue.

x = PDX Noise zone. *The x overlay designates the PDX Noise zone. It designates areas where new residential construction is prohibited due to high noise levels and other areas that permit residential construction but require additional noise insulation in new and reconstructed residences. The Ldn 65 dBA noise contour (decibels), as shown in the 1990 Portland International Airport Noise Abatement Plan Update is the boundary for the PDX Noise zone. All land within that noise contour, including lands within a higher contour, is in the PDX Noise zone. All new structures must be constructed with sound insulation or other means to achieve a day/night average interior noise level of 45 dBA. New residential uses are prohibited within the Ldn 68 or higher noise contour.*

The noise zone overlay is not an issue that would preclude floating home development in the immediate area of North Portland Harbor or alternative sites being considered. The Ldn 68 contour prohibition areas do not overlap any of the potential site alternatives. All of the alternative sites being considered can be mitigated for noise by utilizing proper construction methods and materials.

This is a non-issue in regard to permitting.

B. ***Multnomah County Zoning:***
Along the Multnomah Channel there are areas of undeveloped waterfront with abundant upland area. However, it may be difficult to create additional marinas in these areas based on zoning. The north bank of the Multnomah Channel, Sauvie Island, is zoned exclusive farm use (EFU) which does not allow non-agricultural development. New or expanded marinas would not be allowed. The south bank is zoned for multiple use agriculture (MUA-20). This zoning is intended to allow agricultural lands not suited for commercial farming to be put to compatible uses such as low density residential, forestry, and other uses compatible with the natural resource base. Houseboats and houseboat moorages are a conditional use in this zone.

During the mid and late 1990's, representing the Waterfront Owners and Operators Organization, I actively participated in the Sauvie Island/Multnomah Channel Rural Area Plan rule promulgation, the ordinance was adopted in 1997.

The Multnomah County Comprehensive Plan Framework (Policy 26- Sauvie Island/Multnomah Channel Rural Area Plan) actually designates the MUA 20 zone as

P-105-001

the appropriate zoning area for floating homes and moorages within this plan and specifically includes the following areas as the appropriate sites for such.

Following is the actual verbiage of Multnomah Policy 26:

The following areas are designated as suitable for houseboats:

1. Multnomah Channel (west side).
    a. From Rocky Point Moorage, or from an area 1650 feet north of the southern boundary of Section 36, T3N, R2W, known as Rocky Point, north to the Columbia County boundary.
    b. From the City of Portland corporate limits north to 1/2 mile north of the Sauvie Island Bridge.
    c. Area occupied by Happy Rock Moorage, Sauvie Island Moorage, Parker Moorage, and Mayfair Moorage.
    (Added by Policy 10, No. 2, "Sauvie Island/Multnomah Channel Rural Area Plan," Adopted October 30, 1997, Ordinance No. 887).
2. Oregon Slough.
    a. the south shore of Tomahawk Island.
    b. any other areas identified as suitable for houseboats by the Hayden Island Plan.
3. Columbia River (near 185th Avenue).
    a. From the northwest corner, George B. Pullen D.L.C., To the northeast corner, Pullen D.L.C.

Houseboats and moorages existing outside these areas shall be limited to existing sites and levels of development.

No houseboats shall be located on the Columbia River east of the Sandy River, or in violation of Federal Aviation Administration Clear Zone Standards, or in violation of any other applicable federal, state or local standards.

Please note: The Official name of the North Portland Harbor is "the Oregon Slough." Although the City of Portland had already annexed the eastern half of Hayden Island, the western half is still in the jurisdiction Multnomah County planning and zoned MUA 20; appropriate for house boat development. The south shore of Tomahawk Island is the location of one of the sites mentioned in this study; the property in question is in fee title (not subject to DSL lease) and properly zoned for a floating home moorage. Similarly, the Hayden Island plan allows moorages in all other zones bordering the North Portland Harbor.

P-105-001

All of the Multnomah Channel is subject to the Willamette River Greenway (WRG) overlay. This overlay is designed to protect the natural qualities of the waterway. It does not directly prohibit developments such as marinas. However, the WRG overlay emphasizes preservation of vegetation, wetlands, and flood plains in their natural state which could make development of upland improvements, e.g. parking or septic, to support a new marina difficult.

The author's concerns regarding the WRG overlay are overstated in-that flood plain improvements, including parking and septic are routine design and engineering features that are necessary considerations for every marine development project.

Additionally, all of the Multnomah Channel is rurally zoned and outside the urban growth boundary (see Multnomah County Base Zoning Designations - West Hills and Sauvie Island Rural Plan Areas). Construction of a new marina outside the UGB would require an exception to its urban growth boundary and is subject to review by the State Department of Land Conservation and Development.

Simply put; marina development is not precluded by the Urban Growth Boundary as this study states. The Multnomah County Comp plan and Chapter 34 ordinance have already been scrutinized and accepted by DSCL; they remain in force. Goal exceptions are not required under these circumstances.

In order to deal with the many floating home marinas along the Multnomah Channel, the County inventoried the marinas to determine the number of floating homes, boat houses, boat slips and other uses for each marina. The inventory was conducted in mid-1995 and was subsequently adopted by the County to establish the number of grandfathered units allowed for each existing marina. A recent Multnomah County staff report on a request to add 23 floating home slips to the existing Rocky Pointe Marina recommended to deny additional floating home moorages beyond those previously grandfathered.

The underlined portion of the study document is simply not true.

During the period the regulations were being promulgated, my testimony lead directly to the inventory described above as well as inventories by DSL on a statewide basis. The inventory was actually conducted in 1997 and 1998.

The author simply misinterprets the purpose and significance of the inventory. While the inventory was used to "grandfather" certain moorages as non-conforming uses; these were developments and structures, many of which had bee built with incomplete permitting or constructed before moorages were regulated the way they are now; the underlying purpose was simply to get a baseline for future development limitations and moorage expansions. As an example; the City of Portland was the first

P-105-001

jurisdiction in the state to create a "Floating Structure Code" (Title 28-implemented November 1991), prior to this, normal building codes did not apply.

Also part of the County rule changes was creation of a "Special Plan Area" to allowing existing moorages and new moorages with appropriate zoning a method to increase density beyond the standard density of 1 floating home for every 50 feet of water frontage; not to preclude expansion. Interestingly, although the "SPA" enabling legislation passed into law, the Multnomah County Planning Department, has not established rules for implementation. This is simply a density issue, not a preclusion for expansion.

In regard to the Rocky Point Marina expansion; while staff recommended denial of the SPA, they did recommend houseboat expansion to the standard density:

> Staff recommends the Planning Commission **deny** the request to establish a Special Plan Area because, as outlined in this report, the applicant has failed to establish that the project conforms to the approval criteria outlined in Policy 15 of the County's Sauvie Island/Multnomah Channel Rural Area Plan, nor have they shown that there is a public need, which is required in order for a zone change to be approved (MCC 37.0705(B)(2)). If the Planning Commission accepts the staff recommendation, the applicant would potentially be able to expand the houseboat moorage at a density of not more than 1 unit for every 50 feet of frontage provided they obtain the required land use permits. This would allow up to 23 new floating homes.

This expansion was approved by the Planning Commission as well as the County Board of Commissioners in 2010.

This section of the study document is particularly troublesome in that the study not only draws an erroneous conclusion, based on misinterpretation of the regulations and purpose of the inventory; it is blatantly untrue.

> ***IV. AVAILABILITY OF FLOATING HOME SLIPS***
> *An important consideration in the need for additional floating home marinas is the availability of vacant slips. The following numbers are based on a count from Google Earth aerial photos. The photos are recent, one to three years old, and represent a good estimate of the availability of vacant slips.*
> - *There are approximately 12 potentially available vacant slips in the North Portland Harbor out of approximately 610 floating homes, which is a vacancy of only 2%. These slips may not all available on the real estate market. Some may be held for future development.*
> - *There are approximately 25 vacant slips in Gresham area marinas, McGuire Pt. to Big Eddy.*
> - *There are approximately 12 vacant slips in Multnomah channel marinas up to Scappoose.*

P-105-001

This section of the study does not adequately address the availability of slips by any standard. Supposed vacant areas do not equate to "available slips" and applying a ratio of vacancies base on non-empirical data carries no weight or value. Using Google Earth does not adequately depict the actual use or availably of a site and certainly can not consider issues such as proximity to the federally established ship channel, zoning densities, zoning restrictions, etc. It must be rejected in its entirety.

Based on my experience and knowledge, I do not believe there are currently 12 available slips in the North Portland Harbor. If there are, I would certainly like to know where they are.

> ***V. SITE AVAILABILITY FOR NEW FLOATING HOME MARINAS***
> *The initial focus for this memo was in the vicinity of the North Portland Harbor, however, because of the shortage of sites in this area, the search was extended upstream to Troutdale, and downstream to the Multnomah Channel at Sauvie Island.*
>
> ***North Portland Harbor West of I-5***
> *West of I-5, there is little opportunity for additional marina development. The area between the railroad bridge and Brown's Marina has very little upland area and is mostly owned by the Port of Portland. On the Hayden Island side, between the railroad bridge and West Hayden Marina there is a potential site, area A. The upland area is already developed with a commercial use, however, it might be feasible to redevelop a portion of the parcel to provide upland facilities for floating home marina use.*

I do not believe the Port of Portland property can or should be excluded by a study of potential sites; either on a willing seller basis or by eminent domain. As one of the proponents and most significant benefactors of the CRC project in regard to increased transportation capabilities it could be in their best interest. With this said however, the study is remiss in that the question was not asked nor were the possibilities explored or even considered.

The site mentioned is a small but potential site on a willing seller basis or by eminent domain. West Hayden Island Moorage was previously purchased, permitted and constructed on a portion of this site.

> *Another potential site is the area between the RR bridge and Class Harbor Marina, which is privately owned, area B. It is zoned industrial and marinas are an allowed use. It appears to have adequate upland area. One problem is that it is directly downstream from the swing span of the railroad bridge, so river traffic would be very close to the marina. There is no information showing a restriction on development at this site, but such use might be restricted for safety purposes. There is also a small parcel between Class Harbor and Suttle Road marina that might be filled in with eight to ten homes.*

P-105-001

These may be potential sites, however the upland sites would require additional study to ascertain if indeed the areas can provide adequate ingress and egress (Marine Drive is a commercial route of significance to the state with limitations on driveway inclusions) and parking. The portion adjacent to the railroad bridge is probably too close to the federally established commercial ship channel (that includes a 75 foot buffer) to be considered.

The rest of the river frontage west of the RR bridge on Hayden Island, and downstream from Suttle Road Marina is owned by the Port of Portland and is unavailable for marina development.

Addressed above.

North Portland Harbor East of I-5

Area C is approximately 1,400 feet of shoreline, along the south bank of the North Portland Harbor between Pier 99 Marina and Blue Frog Landing. Zoned general commercial, this area allows floating home marinas and is within the urban growth boundary. It could be a prime location for future marina expansion. However, the upland areas are being developed for interchange commercial uses. Two of the upland properties have been recently developed with motels. The center parcel may be developed in a similar fashion. If this parcel is developed there will be no upland area to support a new marina.

It is my understanding that the owner of this parcel is considering a moorage in anticipation of the CRC project. However, there are significant difficulties developing this site for a floating home moorage. The vacant upland between Pier 99 and Blue Frog Landing, although in fee title, is the flood control dike with specific limits on development and use. Further, the upland areas on both ends of the undeveloped dike may not support the necessary parking and would probably be precluded by the City of Portland regulations that require floating homes to be within 500 feet of the parking area for fire safety and other considerations.

Another open area that might accommodate additional floating homes would be across the channel from Blue Frog Marina. However, all the adjacent upland has already been developed with homes and a public park. There is no room for parking or other facilities necessary for a new marina. As with area C, a floating home marina is not feasible without adequate upland area.

This area is not a potential site. In addition to the reasons cited; it is the location of the original trolley bridge to Hayden Island, it is extremely shallow (above water level in most conditions due to additional silting), its proximity to the park and no available riparian property rights.

East End of North Portland Harbor

P-105-001

Area D is on Hayden Island east of existing moorages. It has appropriate zoning, readily available utility connections and is within the UGB. This is the most likely site on the river for development of a new marina. It is owned by Columbia Crossings, and has been planned for marina expansion for a long time.

This site is a very likely alternative site. During the early and mid-1990's I was involved in the early planning and permitting of this site. While the permitting was successful, for business reasons un-related to feasibility the project was abandoned. The bed of the channel is in fee title, no DSL lease would be required. And because it was previously permitted it can be presumed that it could be permitable again.

This site can and should be considered on a willing seller or eminent domain basis.

Area E, the south side of channel, east of Portland Yacht Club, is a row of single family residences that could be redeveloped to marina use. The zoning is single family residential, so a marina would be a conditional use. However, homes would need to be demolished. Adequate upland and utilities would be available. Perhaps a ¼ mile of river front could be developed. Beyond that, development would be prohibited by the airport noise overlay.

This would be one of the least developable potential moorage sites mentioned in the study for the reasons given as well as practical considerations because of its exposure to wind and wave conditions.

VI. REDEVELOPMENT AND IN-FILL OF EXISTING MARINAS:
Of all the area reviewed, only these six sites were identified as having a likelihood of development. If there is a demand for additional spaces, new sites could also be created through either the expansion of an existing marina or the conversion of an existing boat marina to floating homes. However, both of these options likely present almost as many challenges as establishing a new marina.

The conversion of a boat marina to floating homes has a number of hurdles. Boat marinas have different designs, dolphin spacing, and utilities than what is needed for boat moorages. Such a retrofit would be expensive and require most of the regulatory permits necessary for a new marina: DSL review for change in use; Corps of Engineers for in-water construction; NMFS for in-water construction and use change; and, zoning and building permits. Investigation and permitting for conversion could take nearly as long as a new marina and eventual approval may not be any more certain.

For myriad reasons mentioned above and throughout my response these conclusion are not supported by the evidence. Expanding or reconfiguring an existing moorage is significantly easier and less time consuming that new construction in every jurisdiction.

P-105-001

In fairness to the author, he simply lacks the specific expertise in this extremely narrow field and complex technical arena; marine development, to make such statements, especially when considering the public nature and significant public need represented by the CRC project.

Remarkably, the statement *If there is a demand for additional spaces"* is particularly revealing. Foremost, while there has clearly been a pent-up demand for slips throughout the area, the bridge project itself is creating additional demand.

> *A good example is the Rocky Pointe marina on the Multnomah Channel. It is in the process of review for an in-fill of twenty three floating home slips as well as additional boat slips. The County Staff recommendation is to approve the expansion of boat slips but to deny additional floating home moorages beyond those previously grandfathered. This demonstrates it may be unlikely to obtain additional floating home slips in the Multnomah Channel beyond the number grandfathered in the mid-1995 survey.*

Not only is this not true as demonstrated above; they did obtain the permits for expansion, and as a matter of public record was approve prior to the completion of this study.

> *The greatest problem with conversion is that economics may not support converting pleasure boat slips to floating homes slips. Marina operators indicate that boat slip rentals are possibly more profitable than floating home moorages, especially in the current market. There is still a reasonably good demand for large boat slips.*

This statement is not supported on any factual basis, nor is it supported by any sort of marketing study. While there has been a relatively steady flow of floating home sales, even during the downturn in the economy; absent as much discretionary income, the boat business has been rather decimated in many areas geographically and by boat class; typical of the historic economic trends. Larger boats have always seemed to fare better in hard economic times.

One exception to the "flow" of sales for floating homes in the immediate vicinity; the CRC project seems to have cast a dark cloud over purchasing floating homes within the impact area, many of which have been on the market for quite some time.

With this said however, this has no relevance to the FEIS or the CRC project.

> ***VII. INVESTOR EXPECTATION***
> *Discussions with real estate professionals indicate that there is a general feeling in the development community that it is virtually impossible to develop a new marina through the process of environmental and building code requirements. An effort of four years or more, plus an investment of hundreds*

P-105-001

> *of thousands of dollars for development plans and environmental studies may be necessary before knowing whether a project is viable. This uncertainty makes it difficult to obtain financial backing for such a speculative venture.*

Again the relevance of "investor expectation" in this very public project and process is suspect at best, and does not fulfill the basic process questions of NEPA, the FEIS, Environmental Justice Act, Federal Highway Act nor the Uniform Real Estate Acquisition and Relocation Act of 1971.

As demonstrated throughout my analysis of this study it is simply not "virtually impossible" to develop a new marina in the private sector and certainly not true for the public sector either, especially given the significance of the CRC project.

I must submit that the study may have interviewed the wrong professionals; real estate professional are typically not as well versed in the intricacies of marine development as those involve directly in permitting such complex projects.

> *The ultimate proof of the difficulty of developing a floating home marina is recent market activity. There have been no new marinas constructed in the past decade, on either the Willamette or Columbia rivers in Oregon. The last new marina was McGuire Point, which was completed approximately twelve years ago.*
>
> *The Columbia Ridge marina still has unsold slips after seven years. Most floating home developments are recreational properties and many are owned as second or weekend homes. Since no new marinas were started in the overheated real estate market prior to 2009, it seems unlikely that there would be activity by private investors in the current market for the foreseeable future. Recreational properties have been the hardest hit in the current real estate market.*

Columbia Ridge indeed has unsold slips; rather than for the conclusions and assumptions offered by this study, an underlying this reasons for this is that the developer appears to have over-priced the slips and has some rather difficult criteria for occupancy.

While I do not disagree with the author that marine development is not difficult; the "*ultimate proof … There have been no new marinas constructed in the past decade, on either the Willamette or Columbia rivers in Oregon.*" remains unsubstantiated and is simply not true.

In addition to the recent and current projects mention above, Pier 99 and Rocky Pointe, and Reflection Bay (the previously permitted project on Hayden Island owned by Columbia Crossing (Area D); Mr. Casselman (who previously permitted and built 3 moorages on Multnomah Channel) has expressed interest in constructing a new moorage on his last remaining vacant property on the channel, specifically in response

P-105-001

to the CRC project; Mr. Hamer (developer of Riversbend Moorage on Multnomah Channel) has express interest in expanding his existing moorage.

And finally, a project I am working on has recently submitted applications for development and expansion of a moorage on Multnomah Channel.

> ***VIII. CONCLUSION:***
> *It is very unlikely there will be a new private floating home marina development in the foreseeable future. Zoning and permitting requirements restrict prospective available sites and make it difficult to determine if a new marina would be allowed on any potentially developable sites. Proof of this conclusion is that no new marinas were constructed during the peak of the real estate market a few years ago, so it is very unlikely one would be started in the current market. In-fills and marina conversions could provide additional slips in the North Portland Harbor area, but such development could be time consuming and expensive and may not be permitted by regulatory agencies.*

This conclusion is mistaken, remains unsubstantiated and is simply not true, and in fact there are other areas within the City of Portland that could feasibly be developed for floating home moorages.
Pursuant to the FEIS at 3.81-82:

> ***North Portland Harbor, Portland, Oregon***
> *The LPA would require the displacement of floating homes in the North Portland Harbor. Information regarding floating home availability in the North Portland Harbor is not provided in the reports that informed the above discussion, although some information can be gleaned from the Regional Multiple Listing Service (RMLS) searchable database. A search of the active listings in April 2011 showed approximately 109 housing units listed for sale in Hayden Island, North Portland Harbor, and North Portland. Of that number, 40 were floating homes, 38 were condos, and 31 were conventional homes. The above numbers do not include private listings.*
>
> *In the course of conversations with potentially affected property owners, CRC staff received inquiries about the potential for constructing a new marina to accommodate displaced floating homes. To better understand new marina permitting and construction, the project conducted research on the development of marinas. This research found that there are some likely challenges to developing a new floating home marina, including: permitting through local jurisdictions and environmental resource agencies, acquisition of property, and eventual sale or lease of marina slips (CRC 2011). The project is not pursing the construction of a new floating home marina.*

Although floating homes and floating home moorages are a rather unique form of housing choices creating a significant difficulty comparing them to normal terrestrial based housing choices (or those who choose live on dirt as I like to say), as well as

P-105-001

limits to the Uniform Real Estate Acquisition and Relocation Act requiring geographic, economic and socially equivalent housing. Simply dismissing this uniqueness is not adequate under the act, nor is simply finding "that the replacement units are decent, safe, and sanitary, and in areas that are at least as desirable as the individual's current neighborhood."

Neither is simply checking the *Multiple Listing Service (RMLS) searchable database. A search of the active listings in April 2011 showed approximately 109 housing units listed for sale in Hayden Island, North Portland Harbor, and North Portland. Of that number, 40 were floating homes, 38 were condos, and 31 were conventional homes*

North Portland is not an adequate comparison geographically, socially or economically when considering the housing diversity on Hayden Island and North Portland Harbor.

In discussion with CRC staff, they seem to focus on relocation and yet dismiss the notion of any responsibility for seeking some rather obvious alternatives, including a replacement or expanded moorage. They have not addressed those that would be "temporarily" displaced at all. Relying on the Oregon tax code that considers floating homes "personal" rather than "real property" is simply not enough. In Oregon, floating homes and manufactured homes are considered the same a conventional homes.

> **310.622 Manufactured structures eligible as homesteads under tax laws of state.** A manufactured structure assessed under the ad valorem tax laws of this state shall be eligible to be a homestead for the purposes of all tax laws of this state giving a right or privilege to a homestead. For those manufactured structures assessed as real property, the manufactured structure homestead includes land and improvements to the same extent that a homestead would be recognized if the manufactured structure were a conventional home. [1971 c.529 §11; 1977 c.884 §16]
>
> (Floating Homes)
>
> **310.623 Floating home eligible as homestead.** A floating home, as defined in ORS 830.700, assessed under the property tax laws of this state shall be eligible to be a homestead for the purposes of all tax laws of this state giving a right or privilege to a homestead. [1977 c.615 §6]

The marina the study referred to above in the FEIS; beyond the inadequacies of the study itself; the FEIS does not adequately address the legal questions raised nor does it not fulfill the basic process questions of NEPA, the FEIS, Environmental Justice Act, Federal Highway Act nor the Uniform Real Estate Acquisition and Relocation Act of 1971.

As demonstrated throughout my analysis of this study it is simply not "virtually impossible" to develop a new marina in the private sector and certainly not true for the public sector either, especially given the significance of the CRC project.

P-105-001

Also as state in Chapter 5 of the FEIS:

> *In preparation for the FEIS analysis, project staff conducted a survey of owners and tenants of residential properties potentially displaced by the LPA. This survey determined the characteristics of the households displaced and how each residence is used. The development and distribution of this survey required coordination with property owners, as well as floating home moorage management and boards. The process by which surveys were developed and distributed, as well as the follow-up activities that were undertaken to encourage a high rate of return, are described in detail in the Environmental Justice Technical Report.*

Although CRC staff has indeed worked with those of us who will be displaced by this vital interstate link; the questionnaire failed to ask probably the most important question to those of us in the way.

How many of you would like to remain on the water?

If the scope of the marina study even considered the public nature of the project and the fact that the CRC project must adhere to the legal issues of eminent domain as a result, the study findings would properly be found to be significantly different than described. Certainly, building a freeway bridge over the Columbia River between Oregon and Washington, through several jurisdictions and layers of agency review, can not be less daunting of an undertaking, as this study implies, than permitting and construction of a moorage for those that will be displaced, or even considering, as required, by state and federal policy, alternative sites and proper analysis.

Out of deference to the author of the marina study, marine development is highly specialized and quite complex; a right of way coordinator can not be expected to know the myriad intricacies of my field of expertise. In the same token, I would probably be just as lost if I were to attempt to challenge him in his field of expertise.

This however, given the clear limitations based on the assumptions and limitations of the study (for example *"Marina development is totally a private entrepreneurial effort by individuals or corporations interested in developing a property for profit."*) must call into question if the scope of work and contract for the study pre-ordained the conclusion.

And;

As stated in the report:

> *This memo does not address the legal issues related to the relocation of floating homes by the Columbia River Crossing project under the Uniform Relocation Act.*

P-105-001

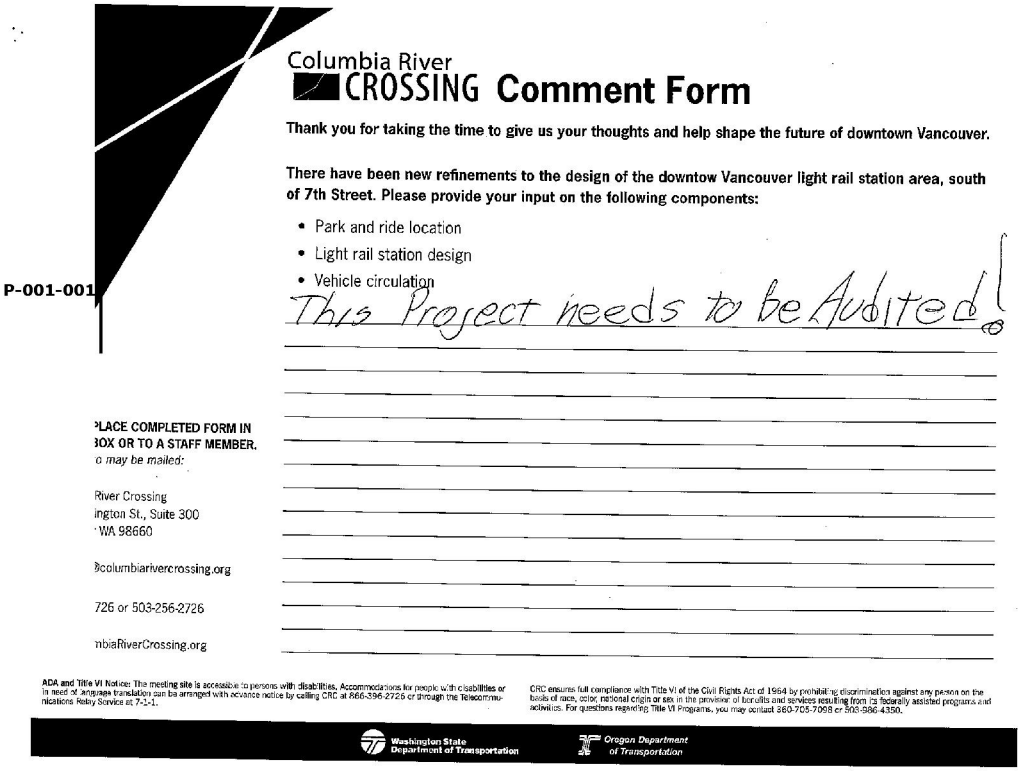
If the study didn't, the FEIS must.

As such the FEIS fails to meet the minimum standards required for moving ahead with approval or acceptance until these issues are resolved and adequate study and standards are followed.

Respectfully,



J. McCaulley



Columbia River
CROSSING **Comment Form**

Thank you for taking the time to give us your thoughts and help shape the future of downtown Vancouver.

There have been new refinements to the design of the downtow Vancouver light rail station area, south of 7th Street. Please provide your input on the following components:

- Park and ride location
- Light rail station design
- Vehicle circulation

P-001-001

This Project needs to be Audited!

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726 or 503-256-2726

nbiaRiverCrossing.org

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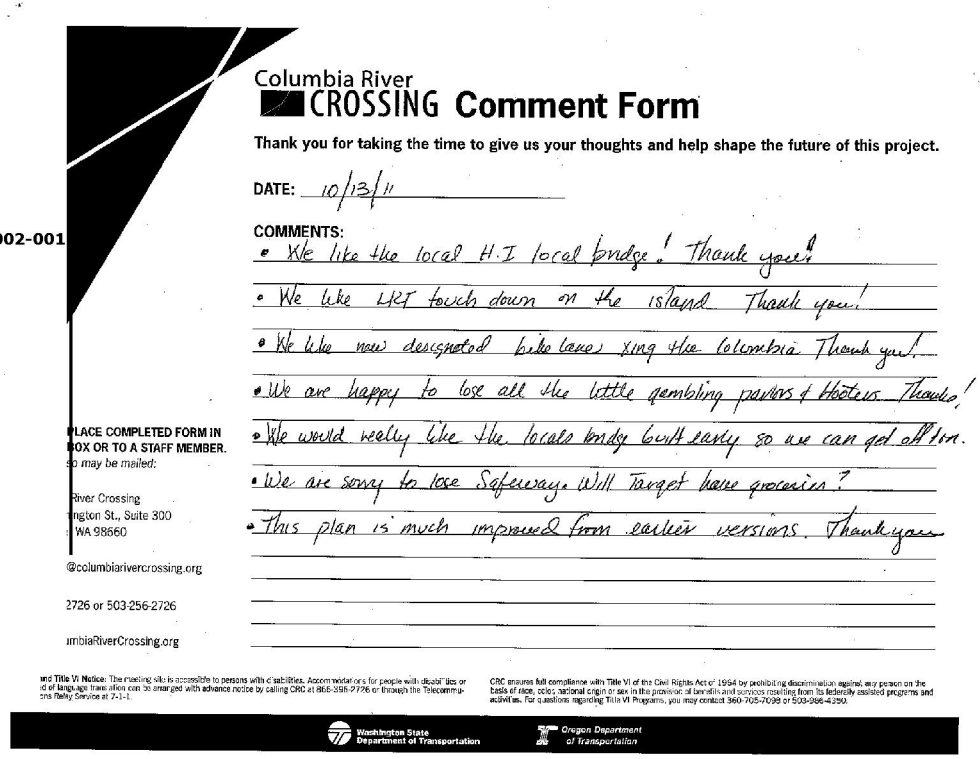
Washington State Department of Transportation

Oregon Department of Transportation

P-001-001

The project is currently being audited and the results will be made available to the public. If you have specific questions about project expenditures, please contact the project office.



Columbia River
CROSSING **Comment Form**

Thank you for taking the time to give us your thoughts and help shape the future of this project.

DATE: 10/13/11

P-002-001

COMMENTS:

- We like the local H.I local bridge! Thank you!
- We like LRT touch down on the island Thank you!
- We like new designated bike lanes xing the Columbia Thank you!
- We are happy to lose all the little gambling parlors & hooters. Thanks!
- We would really like the locals bridge built early so we can get off I-5.
- We are sorry to lose Safeway. Will Target have groceries?
- This plan is much improved from earlier versions. Thank you

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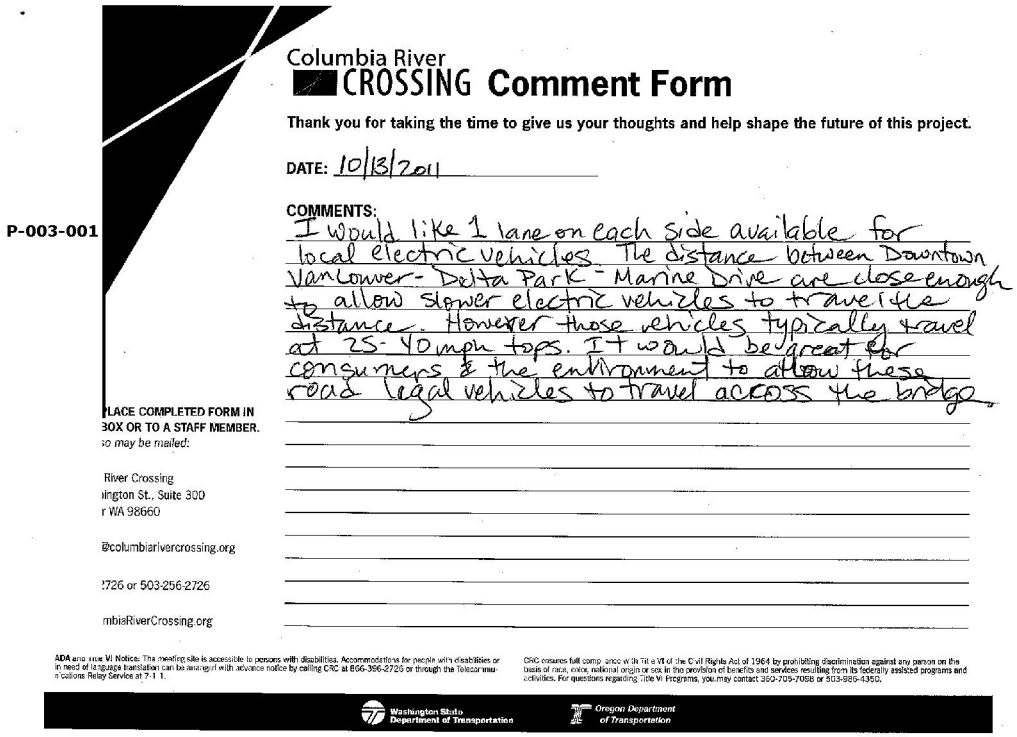
Washington State Department of Transportation

Oregon Department of Transportation

P-002-001

Thank you for your review of the recent design and appreciation for its refinements. Early construction of the local multimodal bridge between Marine Drive and Hayden Island, so that it can be used as an alternate access route during the remaining construction period, will be analyzed during final design. In order for the local multimodal bridge to be built early, the Marine Drive interchange reconstruction also needs to occur so that Marine Drive can be elevated, allowing the light rail extension to cross under Marine Drive. The Marine Drive interchange is expected to take a little more than 3 years to construct, including work at the Victory Boulevard interchange.



Columbia River
CROSSING **Comment Form**

Thank you for taking the time to give us your thoughts and help shape the future of this project.

DATE: 10/13/2011

P-003-001

COMMENTS:

I would like 1 lane on each side available for local electric vehicles. The distance between Downtown Vancouver - Delta Park - Marine Drive are close enough to allow slower electric vehicles to travel the distance. However those vehicles typically travel at 25-40 mph tops. It would be great for consumers & the environment to allow these road legal vehicles to travel across the bridge.

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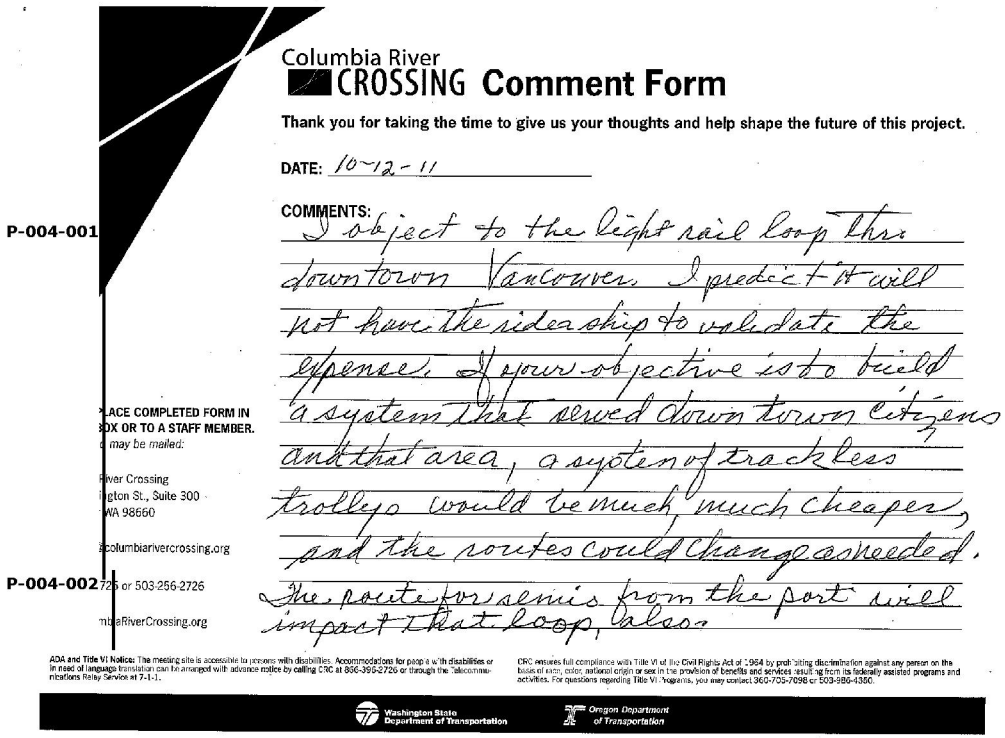
Washington State Department of Transportation | Oregon Department of Transportation

P-003-001

Interstate facilities do not allow neighborhood electric vehicles (NEVs). However, the new local multimodal bridge between Hayden Island and the Oregon mainland will be designed for a lower speed, and will likely be used by NEVs. Because the project supports the use of electric vehicles, when parking management plans are developed for the park and ride facilities, the provision of electric charging stations will be evaluated.



Columbia River
CROSSING **Comment Form**

Thank you for taking the time to give us your thoughts and help shape the future of this project.

DATE: 10-12-11

COMMENTS: I object to the light rail loop thru downtown Vancouver. I predict it will not have the ridership to validate the expense. If your objective is to build a system that served downtown citizens and that area, a system of trackless trollys would be much, much cheaper, and the routes could change as needed. The route for semis from the port will impact that loop, also.

P-004-001

P-004-002

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Washington State Department of Transportation

Oregon Department of Transportation

P-004-001

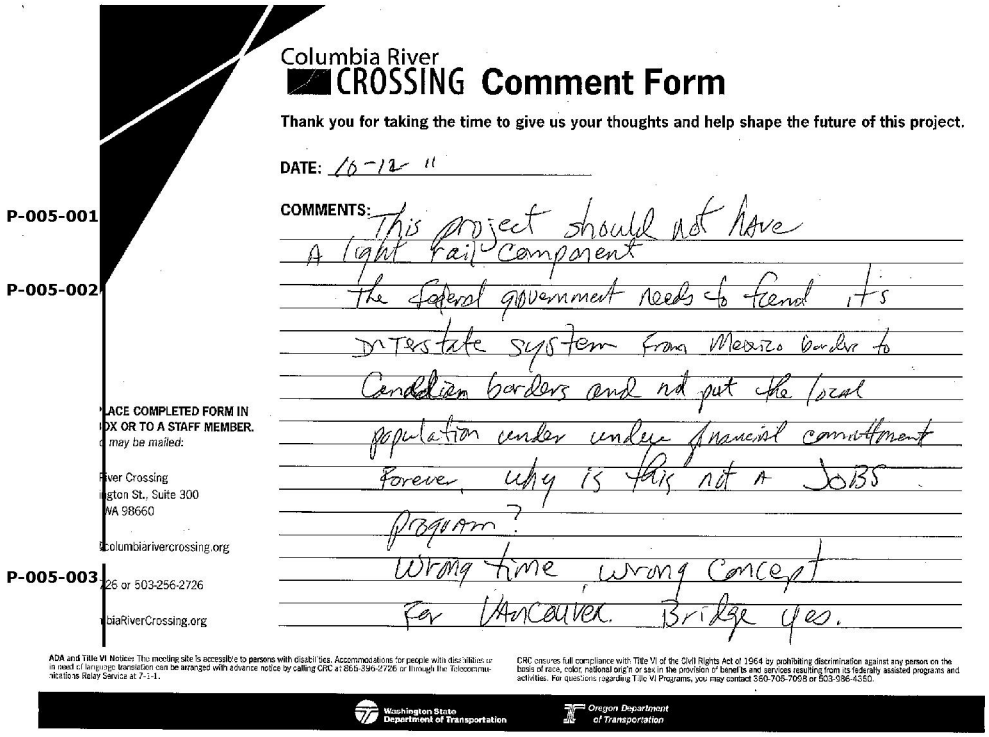
Following the close of the 60-day DEIS public comment period in July 2008, the CRC project's six local sponsor agencies selected light rail to Clark College as the project's preferred transit mode. These sponsor agencies, which include the Vancouver City Council, Portland City Council, C-TRAN Board, TriMet Board, RTC Board and Metro Council, considered the DEIS analysis, public comment, and a recommendation from the CRC Task Force before voting on the LPA. (The CRC Task Force included a broad group of stakeholders representing a range of interests affected by the project - see DEIS Appendix B, Public Involvement, for more information).

Light rail is more likely than other transit options to attract desirable development in downtown Vancouver, which is consistent with local land use plans.

Following the selection of the LPA in July of 2008, the CRC enlisted the help of community members - residents, business owners, transit-dependent populations and commuters - who had interest in light rail planning to form the Vancouver Working Group (VWG). The VWG met regularly to develop recommendations and provided feedback to the CRC project, the City of Vancouver and C-TRAN on transit alignments, proposed station locations and design, security and park and ride facilities in downtown Vancouver. Following approximately 5 months of coordination, in addition to public open houses and walking tours, the VWG recommended the Washington-Broadway Couplet through downtown Vancouver to C-TRAN and City of Vancouver staff. Per the Vancouver Working Group Final Report (October 2009), this alignment was preferred largely because it spread the potential impacts and benefits across two streets, as opposed to concentrating them on a single street. This alignment was adopted as part of the LPA and is analyzed in the FEIS. For more information on the transit alignment decision-making process please see Chapter 2 (Section 2.7) of the FEIS.

P-004-002

Thank you for thinking of freight mobility, which is an important purpose of the project. The traffic modeling done for the City shows improvements to many intersections, even with frequent light rail service. The routes for trucks have been particularly important. Working with the freight and trucking community, the project has identified many current design problems, and has included improvements related to these, especially at Mill and Fourth Plain Boulevards in Vancouver, as well as Marine Drive in Portland.



Columbia River
CROSSING **Comment Form**

Thank you for taking the time to give us your thoughts and help shape the future of this project.

DATE: 10-12-11

COMMENTS: This project should not have A light rail component the federal government needs to fund it's Interstate system from Mexico border to Canadian borders and not put the local population under undue financial commitment forever. Why is this not a JOBS program? Wrong time, wrong Concept For Vancouver. Bridge yes.

P-005-001

P-005-002

P-005-003

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P-005-001

Preferences for specific alternatives or options, as expressed in comments received before and after the issuance of the DEIS, were shared with local sponsor agencies to inform decision making. Following the close of the 60-day DEIS public comment period in July 2008, the CRC project's six local sponsor agencies selected a replacement I-5 bridge with light rail to Clark College as the project's Locally Preferred Alternative (LPA). These sponsor agencies, which include the Portland City Council, Vancouver City Council, TriMet Board, C-TRAN Board, Metro Council, RTC Board, considered the DEIS analysis, public comment, and a recommendation from the CRC Task Force when voting on the LPA.

With the LPA, new bridges will replace the existing Interstate Bridges to carry I-5 traffic, light rail, pedestrians and bicyclists across the Columbia River. Light rail will extend from the Expo Center MAX Station in Portland to a station and park and ride at Clark College in Vancouver. Pedestrians and bicyclists would travel along a wider and safer path than exists today.

For a more detailed description of highway, transit, and bicycle and pedestrian improvements associated with the LPA, see Chapter 2 of the FEIS.

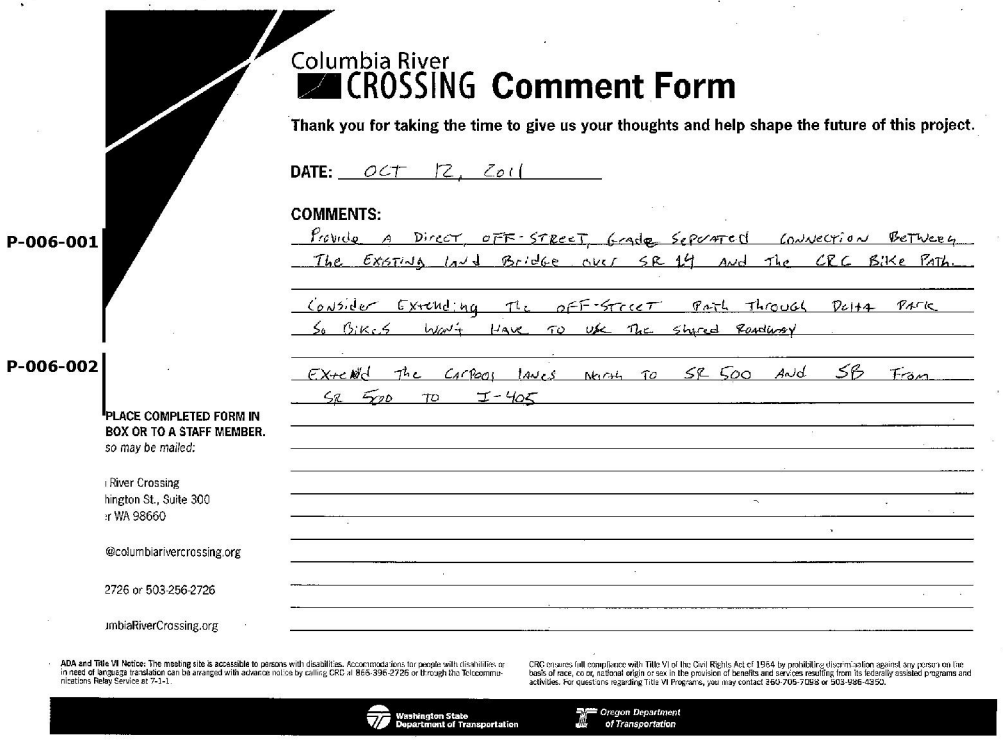
P-005-002

The Interstate provides mobility for more than just long, interstate trips. It provides a main arterial-like crossing for local residents and workers as well. It is therefore a shared responsibility to construct the project and fund it locally (with tolls), at the state and federal levels. The project will, in design and construction, create thousands of jobs.

P-005-003

Light rail is an essential component of the locally preferred alternative,

and is a critical part of meeting the project's purpose and need, as discussed in Chapter 2 of the FEIS. The project is anticipating a combination of federal and state funds as well as toll revenues to pay for construction, as described in Chapter 4 of the FEIS. The project is expected to provide jobs and promote economic activity.



Columbia River
CROSSING **Comment Form**

Thank you for taking the time to give us your thoughts and help shape the future of this project.

DATE: OCT 12, 2011

COMMENTS:

P-006-001

Provide A Direct, OFF-STREET, Grade Separated Connection Between The Existing Land Bridge over SR 14 and The CRC Bike Path.

Consider Extending The OFF-STREET Path Through Delta Park So Bikes Won't Have To Use The shared Roadway

P-006-002

Extend The CarPool lanes North To SR 500 And SB From SR 500 To I-405

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Washington State Department of Transportation | Oregon Department of Transportation

P-006-001

Thank you for your comment. The LPA's current design was developed to enhance the biking experience through the project area. Specifically, project staff and advisory committee members focused on the connections between downtown Vancouver and Delta Park, and identified numerous ways to improve the network.

There will be a nearly continuous, off-street connection between the Vancouver National Historic Reserve and the bridges. The Land Bridge crosses over SR 14, and lands in Apple Tree Park. This Park will be directly connected to Main Street. Both Main Street and Columbia Way will lead to the access points with the new bridge.

The project does not include changes to Delta Park's bikeway, but does improve connections in this area. Not only will the project connect better to Delta Park, it will also connect the Marine Drive and Bridgeton Trails to the network.

P-006-002

High occupancy vehicle (HOV) lanes work when they are part of a network, and could potentially be a useful tool in the CRC area if employed as part of a regional plan. The 5-mile CRC project by itself is too short in length to provide the true benefits of HOV lanes, but should the region adopt and develop a HOV system, lanes within the bridge influence area could potentially be designated as part of the network.

The CRC project team has looked at HOV lanes and freight lanes, which are typically located on the inside freeway lane next to the barrier, as part of its technical analysis. Because about 70 percent of the vehicles enter and/or exit I-5 within the 5-mile study area, access to and from a HOV lane or freight lane could create traffic operational problems by increasing lane changes (for example, HOVs entering the freeway and

needing to merge all the way to the inside lane). The results of this analysis are described in more detail in Section 3.1 of the DEIS.

Hines, Maurice

From:	N . [waave@msn.com]
Sent:	Saturday, September 24, 2011 3:48 PM
To:	Columbia River Crossing
Subject:	Important bridge question
Categories:	Blue Category

P-007-001 Hello was just wondering why you have the new bridge accross the river curved? Is that even needed, doesn't that make it much more expensive making the new bridge go straight across the river? Please let me know thank you.

P-007-001

It is curved primarily to match with the location of existing interchanges at either end, while allowing traffic to continue using the existing bridge as the new bridge is being constructed. The curve does not add substantial costs and reduces impacts, ROW, and other costs that would be associated with relocating the existing interchanges.

Hines, Maurice

From: cecelia antonio [ceceliaantonio@yahoo.com]
Sent: Tuesday, October 11, 2011 6:06 PM
To: Columbia River Crossing
Subject: Construction logistics

Categories: Red Category

P-008-001

Are they going to build the new bridge and then tear down the old one, or tear down the old one before starting construction on the new bridge ? My real question is, of course, how long are we going to be without a bridge ?

Also, why is this process taking so long ? I think we've been talking about this new bridge now since 2006... and construction isn't planned to start until 2012. Didn't Kennedy expand our space program in 1961 with the goal of putting a man on the moon, and we accomplished that goal in 1969 ? Really, we're not going to the moon here; this is just a bridge...

If you can get back to me, that would be great.

Thanks !
Cecelia

Cecelia Antonio
1331 E Reserve St
Vancouver, WA 98661

P-008-001

Three lanes in each direction will be maintained across the river, during peak periods, throughout the duration of construction. The existing bridges will not be taken down until the new bridges are functional and traffic rerouted onto them.

The project was conceived as part of the I-5 Transportation and Trade Partnership study that was completed in 2002. The high capacity transit extension to Vancouver was studied in detail in the 1990s. It does take a long time to plan; design; secure agreements, decisions and funding; and then build large transportation projects. However, the formal NEPA process started only six years ago. Six years is a short period within which to complete the NEPA process for a project of this complexity, and with many sponsoring agencies (including federal highways and transit, two cities, two states, etc).

P-009-001

Columbia River
CROSSING **Comment Form**

Thank you for taking the time to give us your thoughts and help shape the future of this project.

DATE: 10/12/11

COMMENTS: Please Fix Cedar creek ROAD IN WOODLAND NO shoulder on ROAD after 4mile mark EXtremely Dangerous !!!

Mary August

PLACE COMPLETED FORM IN BOX OR TO A STAFF MEMBER.
Forms may be mailed:

River Crossing
Ington St., Suite 300
WA 98660

@columbiarivercrossing.org

726 or 503-256-2726

mbiaRiverCrossing.org

ADA and Title VI Notice: The meeting site is accessible to persons with disabilities. Accommodations for people with disabilities or in need of language translation can be arranged with advance notice by calling CRC at 866-396-2726 or through the Telecommunications Relay Service at 7-1-1.

CRC ensures full compliance with Title VI of the Civil Rights Act of 1964 by prohibiting discrimination against any person on the basis of race, color, national origin or sex in the provision of benefits and services resulting from its federally assisted programs and activities. For questions regarding Title VI Programs, you may contact 360-705-7098 or 503-986-4350.

Washington State Department of Transportation | Oregon Department of Transportation

P-009-001

That location appears to be well outside the scope of the CRC project. However, you may want to contact the City or County and let them know your concern about that particular roadway in Woodland.

From: REX BAHR [mailto:rexbahr@hotmail.com]
Sent: Friday, September 23, 2011 6:58 PM
Cc: FEDERAL DEPT TRANSPORTATION; GOV OREGON; Jefferson Smith; Lars Larson; Sen Monroe; VIEWERS-VOICE KATU-2; Congressman Earl Blumenauer; CNN .COM; CITYINFO POORTLAND; Columbia River Crossing
Subject: Re: September 2011 Project eUpdate - Final EIS available

P-010-001 If you put a $ toll on all the bridges, a 8.5% sales tax in Oregon & a $0.25 tax on ground based fuel you would not even need a new bridge.
The money to be to support almost FREE mass transit.
The traffic on I-5 would fall by half.

P-010-002 To get traffic moving on the interstate do like Texas.
On the overpasses place signs = the left lane 85 the next right 75 the next right 65 and the far right 45
The trick is to get people to where they want to go.
If a person is driving from Salem to Seattle they should be able to cruise at 85 to Seattle all the way.
Rex R. Bahr

P-010-001

Thank you for suggesting creative approaches to meeting the project's purpose and need. However, it is not within the purview of the project to institute a sales tax in Oregon or to increase the gas tax.

P-010-002

During the project screening phase, ideas such as this were considered. And the two states may yet adopt such an approach at a regional level. However, it is difficult to do so within the CRC study area because the interchanges are very tightly spaced. Motorists will, of their own volition, use far left lanes for through trips, and the project has not included any left side ramps. But the project also does not want to encourage unnecessary weaving within the project area.

From: REX BAHR [mailto:rexbahr@hotmail.com]
Sent: Tuesday, October 11, 2011 11:35 PM
Cc: DOT COMMENTS; Eileen portland traffic; FEDERAL DEPT TRANSPORTATION; CNN .COM; Congressman Earl Blumenauer; GOV OREGON; IMMIGRATION,Roy Beck; Jefferson Smith; KANDU KID; Lars Larson; lightout LIGHTOUT; OutragedPatriots DANHOWARD; Sen Monroe; VIEWERS-VOICE KATU-2; Columbia River Crossing
Subject: Re: October 2011 Project eUpdate - Learn more about Final EIS Oct. 12 and 13

Why don't you do it SIMPLE or KISS?
A $0.20 tax on all ground base FUEL, $0.10 to fund MASS TRANSIT & $0.10 to the school system and not the overpaid COLLEGE BOYS.
A 8.5 % sale tax, 4% to the schools and 4% to Hospitals and .5% to the business to collect the tax.
AND DO NOT PUT PERIODS AFTER ANY ADDRESS OR ANYTHING AS IT MAKES IT TO HARD TO COPY
When this is done you will not even need a new bridge and in 50 years we/you will need horses, so why waste the money?
I am 76 so I do not need a bridge and I have no need to go anywhere and besides in Oregon it is too expensive to go anywhere
I have to pay my outrageous taxes and water bill
REX ROMAINE BAHR

From: Jesse A. Buss [mailto:jessebuss@gmail.com]
Sent: Friday, October 14, 2011 5:07 PM
To: Morrow, Steve
Subject: Released from eSafe SPAM quarantine: CRC In-Water Work Window variances

Hi, Steve:

P-011-001 I just finished leaving you a voicemail message, and thought I would follow up with a quick email. Regarding the CRC IWWW variances, my question is: is there documentation of the variances being submitted, reviewed, and approved? And, if so, where can I find that documentation? Comment response S-006-003 to the ODFW's DEIS comments states that the CRC project has received a variance from the normal IWWW, but I cannot find any reference to a variance in the FEIS itself.

Thanks for your time and assistance. best,

jesse

P-011-001

Below is the text of the email sent from CRC project staff to the commenter. Enclosed tables referenced in the email are available on the CRC project website.

"Thank you for your question. Over the last 5+ years, the CRC project team has met with staff from ODFW & WDFW as well as NMFS and USFWS as part of the on-going Interstate Collaborative Environmental Process (InterCEP) [http://columbiarivercrossing.org/FileLibrary/GeneralProjectDocs/InterCEPAgreement.pdf]. Extensive discussions occurred in 2009 and 2010 on the In-Water Work Window (IWWW). Thetable I have enclosed was the result of those discussions. This table is also in the CRC Biological Assessment, Table 3-2. In April, 2010, both the ODFW & WDFW InterCEP representatives had agreed in principal with CRC's proposed IWWW and verbally acknowledged their agencies would grant a variance. Formal review and approval of an IWWW variance would occur under the Fish and Wildlife Coordination Act (FWCA) for both Oregon and Washington. The results of these processes are documented as part of permit issuance conditions of the Oregon Removal-Fill permit (ODSL) and the Washington Hydraulic Project Approval (HPA) (WDFW). The CRC project team will apply for regulatory permits such as Clean Water Act Section 404, Oregon Removal-Fill and Washington HPA in early 2012. At that time, ODFW and WDFW will conduct their formal review of the proposed IWWW and make a determination of a variance under the process described above. In the Biological Opinion (BO) issued by NMFS (enclosed), there is a section called "Description of the Proposed Action" that begins on page 3 of the BO. At the bottom of page 6 it describes how and when impact pile driving will occur during construction (September 15-April 15), and shows it in table form (Table 4) on the following page. There was no variance asked for or granted; it was simply considered part of the project and thus part of the impact analysis or incidental take analysis NMFS conducted to prepare their BO. In the BO, the Terms and

Conditions #2(a) i.-iv. (page 80 of the BO) describe peak hydroacoustic noise limits dependent upon time of the year and on the construction and demolition activities that would be allowed year-round.

If you have any further questions or follow-up please do not hesitate to contact me; I am happy to assist."

Hines, Maurice

From: Robert Dean [robert@deansurveying.com]
Sent: Sunday, October 16, 2011 9:04 PM
To: Columbia River Crossing
Subject: CRC FEIS deficient construction impacts
Attachments: donwagnerletter.PDF; ATT13307343.htm

P-012-001

The FEIS fails to adequately address potential or likely adverse impacts due to actual construction on local commerce, residents, small businesses, and regionwide transportation networks.

Attached is a letter I sent to Director Don Wagner in January 2011 with detailed concerns that were not addressed in the FEIS.

Robert Dean
7101 NE 74th Ave.
Vancouver, WA 98662
(360) 892 2600

Sent from my iPhone

Begin forwarded message:

From: Robert Dean <robert@deansurveying.com>

This attachment is my revised letter.

Sent from my iPhone

Begin forwarded message:

From: "Robert Dean" <robert@deansurveying.com>
Date: January 3, 2011 6:44:34 PM PST
To: leavitt@cityofvancouver.us
Cc: "Rorabaugh, Thayer" <thayer.rorabaugh@cityofvancouver.us>,"Holmes, Eric" <eric.holmes@cityofvancouver.us>, jeanne.harris@cityofvancouver.us,wagnerd@columbiarivercrossing.com
Subject: meeting with Don Wagner
Reply-To: robert@deansurveying.com

January 3, 2011

Today I met with Don Wagner at his office between 1:30 and 2:30. Jeanne Harris arranged the meeting and was there briefly to introduce us. She had to leave for another appointment and so she asked Thayer Rorabaugh to stand in for her. Thank you Jeanne!

Don Wagner led off with assurances that he had read my previous letter on traffic staging and they were addressing my concerns. Thayer, also, had been forwarded from Tim Leavitt a similar letter which he had read. Thayer gave examples from past projects of how they work with local businesses and do their best for them. I expressed thanks to Tim Leavitt and the City for asking the

1

P-012-001

This letter from Mr. Dean is his account of a meeting he had in January 2011 with Don Wagner, the former CRC Project Director from WSDOT, and Thayer Rorabaugh from the City of Vancouver. He also attached the list of questions and concerns that he had sent to Mr. Wagner in advance of their meeting. Mr. Dean's account appears to indicate that he was able to ask the questions he wished to ask, and received answers from Mr. Wagner and Mr. Rorabaugh. The responses below do not remark on Mr. Dean's account of that meeting.

For information on construction impacts and mitigation, Mr. Dean is referred to each sub-section of Chapter 3, which discusses temporary impacts and mitigation measures for each element of the environment. Additional discussion is provided in the technical reports that support the FEIS.

The responses below address the list of questions that Mr. Dean prepared in 2010, and resubmitted with his comment letter on the FEIS in October 2011, to the extent that they are relevant to the NEPA review.

P-012-001

right questions and for Resolution M3663. Don and Thayer said they are going through the list of caveats in the LPA to make sure they are addressing them.

I acknowledged their success with previous projects (Salmon Creek and Delta Park) and asked if they would do specific studies on this one to protect small businesses; especially since this project will last up to nine years. I mentioned legal (Executive Orders) and moral imperatives to look out for small businesses. I explained the 5 year refinancing problem building owners face and used my building in Hazel Dell as an example.

I gave Don the newspaper article on the WSU study of economic impacts of reconstruction of the locks and also Ken Casavant's bio and contact info. He seemed interested in pursuing my request.

I mentioned that the DEIS attributes an estimated $8 million annual savings to the trucking industry in 2030 with build out of the new bridge. Is that enough savings to justify $4 billion expenditure? Don responded that that was only for one aspect of benefits. I suggested that commuters would have no net benefit because we will be paying for it with tolls. Don said we would only be paying a third (let's see, $1.5 billion capital plus interest plus collection costs plus cost overruns =?).

I asked if there was a cost/benefit analysis for the project. No. Was he aware that Steve Stuart had asked for one for tolls? Yes. It has not been done yet because they do not have a final design (he implied that they might be going with the Kevin Peterson design).

We talked about the need for an SEIS and the political inertia involved. They both are aware of sunk costs and the benefits of spending money during design phase rather than as cost overruns later. Don Wagner said, "Tell it to the Columbian editorial board."

I had mentioned the need for an SEIS to Tom Warne earlier. He was very circumspect. I got the impression at this meeting that it is being discussed. Don Wagner said he is meeting this afternoon with the feds to find out who is the lead agency on the project. I suspect Tom Warne wants to know if an SEIS will be called for if they switch to the Kevin Peterson design.

Don mentioned that there are hundreds of ways for the project to fail. Most prominent causes are funding and political will. He mentioned voting (on light rail) and the last elections (alluding to the election of Jaime Herrera I think). He seemed melancholy to me and resigning himself to imminent failure of funding. He exchanged glances with Thayer as if they had just been talking about it before I came.

I said I did not know of anyone who wanted to see the project fail. Don disputed that. I said I am on the email lists and some want to see light rail fail and some want to see tolls fail but we all want a better crossing that we can afford and that does what it's supposed to do.

Don said several times things like "If this gets built" and "If they build this design" as if he has doubts that anything will be built and if anything it will be Kevin Peterson's design. He said the IRP Expert Panel will be reporting January 19.

We talked about the original scoping and that there was no justification in the record for rejecting the Bi-State Industrial Corridor. I suggested the need for a Supplemental Environmental Impact Statement going all the way back to scoping and goal setting. The number 1 goal should have been to relieve the choke points to commerce on the West Coast of the US and allow future growth. If the Bi-State Industrial Corridor failed question 6 in Step A Screening Report then did they ask the right questions?

Don mentioned that a westerly arterial, west of the lake, to Ridgefield was rejected about 20 years ago. I suggested that was a lot of freeway to build through a wilderness.

We talked about preserving the historic bridges. Don said they are spending tens of millions to mitigate for the loss of 1.5 acres of the Historic Preserve. The bridges themselves are doomed.

P-012-001

They are seen as a safety hazard by WSDOT (legal justification for destroying them) and the bridge lifts are a nuisance to Downtown commerce.

We talked about retro-fitting the Interstate Bridges for seismic safety. Don said the $300 million cost was for the first stage only – piers.

Don and Thayer both dispute that the RR bridge can be raised. They say for 90' clearance above the water and at 2% grade the RR would land too far North to make the Vancouver yards. My preliminary calculations from the GIS say it would land under the Mill Plain Overpass.

I suggested they redo the RR bridge and build the Bi-State Industrial corridor with light rail, bike paths, etc. and have it paid for by the RR, Coast Guard and Ports rather than on the backs of Vancouver commuters. They scoffed that the RR, Coast Guard or Ports would pay for anything.

Thayer said most of the Port traffic goes East and there is little truck traffic between ports. I did not have a chance to dispute that as we moved on to other things.

P-012-002

Don said the rumor that they hope to toll both crossings (I-5 and I-205) is not true. He wishes it would go away. He did say they might consider pre-construction tolling as they are doing in Seattle. I suggested that was a good idea and that they should test their financial and traffic projections immediately before committing the $4 billion. I asked if any law changes were required for tolls. He said no federal changes for I-5 (not so for I-205) and some changes for Oregon and Washington.

I gave Jeanne Harris and Don Wagner signed hardcopies of the attached donwagnerletter.PDF

Robert Dean, President
Dean Surveying, Inc.
717 NE 61st St., #100
Vancouver, WA 98665
(360) 892 2600
fax (360) 256 1156

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

P-012-002

The project will continue to assess pre-construction tolling.

DEAN SURVEYING, Inc.
717 NE 61st St., Suite 100
VANCOUVER, WA 98665
(360) 892 2600

January 3, 2011

CRC Project Vulnerabilities

Potential Adverse Impacts on Downtown Vancouver Commerce

P-012-003 This paper is an expression of concern for the wellbeing of designers, workers, businesses, commuters, and citizens of the communities who will be affected by construction of the Columbia River Crossing Project.



P-012-003

Thank you for your comments.

DEAN SURVEYING, Inc.
717 NE 61st St., Suite 100
VANCOUVER, WA 98665
(360) 892 2600

January 3, 2011

Don Wagner
700 Washington Street, Suite 300
Vancouver, WA 98660

Re: Project Vulnerabilities

Mr. Wagner,

This project faces significant, potentially fatal, obstacles; each of which requires further study, as follows:

P-012-004
1) Funding. Each leg of the stool is in serious jeopardy.

P-012-005
2) Public opposition. There is no cost/benefit analysis and no consensus of public support.
3) Public input. The more people learn about this project the more opposition arises. The only way to gage public support is through an informed vote. The City of Vancouver asked for truck detours during construction and studies of construction impacts. Steve Stuart asked for a cost/benefit analysis on tolls – has that been done? Tim Leavitt and Sam Adams asked for an analysis of our community's ability to pay for the project – has that been done? The IRP called for an investment grade study of tolls - has that been done? The Plaid Pantry report disputed the economic analyses of the DEIS – have those claims been explored?

P-012-006
4) Political change. We have a new congresswoman, the US Senate no longer supports earmarks, and more local Republicans have been elected to the Washington State Legislature.
5) Weakened support from the media. The Columbian endorsed the opponents of Jim Moeller and Patty Murray in the last elections.
6) Economic decline. The project was conceived and planned for during the height of economic optimism in the early and mid-decade 2003-2007.
7) Economic stress. The DEIS identifies many local funding sources, besides tolls, that are now no longer available as local agencies scrap to shore up their own budgets.

P-012-007
8) Scoping. The initial scoping omitted viable alternative routes that had previously been studied and that may have alleviated many of the obstacles now facing the project. Each of the obstacles now coming to light could have been avoided with careful and comprehensive scoping and goal setting in the initial design stages.

P-012-008
9) Benefits not there. Traffic projections have not borne out.

P-012-009
10) Construction impacts on commerce. Temporary impacts, especially on small businesses, due to construction have not been studied. The DEIS projects as much as 9 years of construction. That will affect two refinancing cycles of most affected businesses. The DEIS promises more studies– have these been done?
11) Systemwide traffic impacts due to construction. Is it possible to work on I-5 without plugging I-205? Have all the stakeholders been consulted? Where is the justification for rejecting the Bi-State Industrial Corridor #4?

P-012-010
12) Historic preservation. The DEIS promises further studies – have these been done? Can anything be done to save the historic, iconic bridges or should that have been part of original scoping?

Respectfully,

Robert Dean, President

P-012-004

Please refer to Chapter 4 of the FEIS for a description of the current plans for funding construction and operation of the LPA. This discussion provides an updated assessment of likely funding sources for this project, though it is not common practice to receive funding commitments prior to completion of the alternative selection process. As described in the FEIS, project funding is expected to come from a variety of local, state, and federal sources, with federal funding and tolls providing substantial revenue for the construction.

P-012-005

There are no plans to hold an election on the project as a whole but the C-TRAN operating funds will be subject to a public vote.

P-012-006

The project has completed a benefit cost analysis. It can be reviewed at, or a copy obtained from, the project office. In addition, the project has completed Cost Estimate Validation Process (CEVP) studies and will, following the ROD, complete an investment-grade tolling analysis.

P-012-007

Many alternatives were considered during the CRC alternatives evaluation process, including alternatives that had been previously studied. See the discussion in Chapter 2 of the FEIS. It is unclear from this comment what obstacles Mr. Dean is referring to.

P-012-008

There is no question among the local, state, and federal sponsoring agencies that the project relieves congestion, improves travel time, increases transit ridership, and will reduce crashes.

QUESTIONNAIRE

Cost Overruns

P-012-011

Who pays cost overruns?

Have there been cost overruns on recent projects?

By WSDOT?

By ODOT?

By DEA?

By PB?

By CH2M Hill?

By Parametrix?

What is the likelihood of cost overruns on this project?

Has the design phase experienced cost overruns?

Do you see that as good or bad?

P-012-012

Have you done studies to show that the community can afford this project as Tim Leavitt asked in March 2010?

Have you studied the Plaid Pantry report? Do you have a formal rebuttal?

The Columbian reported that the CRC did not dispute the numbers in the Plaid Pantry report. Do you stand by that assessment?

The Plaid Pantry report is at odds with your studies on tolls. Will you consider testing the studies by imposing tolls in advance, as suggested by Steve Stuart in March 2010, before spending $4 billion?

Sam Adams and the Plaid Pantry report both express concerns that the third leg of the stool, $1.5 billion in local funding, will compete with or cannibalize other local projects. How can it do otherwise?

What would it take to cause this project to fail?

What will be the effect on Vancouver if this project fails economically?

What would be a worst case scenario?

P-012-009

Additional analysis of construction-related impacts to businesses was conducted for the FEIS.

It is possible to stage traffic on I-5 during CRC construction so as to avoid significantly impacting I-205. All stakeholders have been given opportunities to consult.

Chapter 2 of the FEIS discusses the rationale for not advancing the Bi-State Industrial Corridor idea into the DEIS.

P-012-010

As indicated in Chapter 3 (Section 3.8) of the DEIS, the 1917 (northbound) I-5 bridge structure is listed on the NRHP. The 1958 (southbound) bridge, as a bridge on the National Interstate System, was determined not to be significant at a national level and is not considered eligible for the NRHP. However, the two bridges together are an important element of the historic fabric both for the region and for downtown Vancouver.

Because the 1917 bridge is listed on the NRHP, it is afforded special protection under Section 4(f) of the Department of Transportation Act. This law prohibits the USDOT from funding any project that would have an adverse impact on significant historic resources, unless it can be demonstrated that there are no prudent and feasible alternatives that would avoid that impact.

The Supplemental River Crossing, which maintained the existing bridges with seismic retrofits and was analyzed as a component of two of the five alternatives studied, was determined feasible, but not prudent. It would not satisfactorily meet the project Purpose and Need. In addition, the alterations necessary to make the existing bridges safe, reliable, and fully multimodal, as described in Chapter 2 of the DEIS and FEIS, would

P-012-012

How are you following Executive Order E 1038.00 WSDOT and Risk Management Planning guidelines? Do you have an economic cost/benefit analysis?

What risks have been taken into account? Number of parcels? Impacts on access? Litigation costs and delays? Change of grade? Temporary construction permits? Existing conditions assessment?

What effect will failure of the project have on your career?

How accountable is each member of your team for success or failure of the project?

As an engineer are you required to alert your employer if and when you see that the project will fail?

Are you confident that every member of your team is free to alert you to possible points of failure?

What measures have you taken to facilitate sensitivity to and awareness of weaknesses in the process?

What is an example of a possible fatal flaw?

Have you published a simple cost/benefit analysis table for the local funding portion as Steve Stuart asked in March 2010?

P-012-013

The DEIS estimates the annual savings for the trucking industry in 2030 for build over no-build to be $8 million. Is there a similar quantifiable benefit for commuters?

Will trucks pay the same toll as commuters?

Will tolls vary by length of vehicle, weight, number of occupants, speed, value, carbon footprint?

The DEIS estimates the net capital amount to be raised by tolls to be $1.5 billion. Do you have an estimate for the total gross amount to be extracted from toll-payers?

undermine the historic integrity of the bridges. The Sponsoring Agencies therefore decided to remove and replace the existing bridges.

Proposed mitigations for the adverse effects of the NRHP-listed I-5 bridge can be found in Chapter 3 (Section 3.8) of the FEIS.

P-012-011

Past financial performance is an important issue but is not relevant to the NEPA review process. The Record of Decision concludes the NEPA analysis. It indicates which alternative has been selected by the federal government, and allows for the continued design, eligibility for federal funding and permitting, and eventual construction of that alternative. The Locally Preferred Alternative is supported by local, regional, state, and federal agencies and has been selected following an exhaustive analysis and public involvement program.

The project takes the issues of financial management very seriously. Project staff have provided Mr. Dean with considerable records and reports and has responded to his inquiries. The project is currently developing new financial reporting mechanisms and has started providing monthly reports on the web. The project will continue to work with the public to improve transparency and an understanding of the resources required for an undertaking of this scale.

P-012-012

Highway tolls would pay for the local share of the project costs. A range of toll rates was analyzed. A toll of $2 each direction is assumed in the ridership analysis in the EIS. That analysis indicates that such a toll would be enough to discourage some trips from being taken. We don't know if those trips wouldn't be taken due to affordability or due to preference reasons. See the discussion in Section 3.1 of the FEIS.

Regarding the Plaid Pantry report, please see responses to P-047 from

Traffic Staging

P-012-014

How long will portions of I-5 be under construction with this project?

What part did traffic staging play in scoping, goal formulation, and the selection of alternatives?

What part did traffic staging play in the selection of the final locally preferred alternative?

Is it possible that the traffic staging problem could present a fatal flaw to the success of the project?

How have you taken the City of Vancouver Resolution M3663 to heart?

What provisions have you made to detour trucks around the construction zone?

Is it possible that traffic staging problems may prompt you to revisit some alternatives that were previously rejected?

How long will construction last? How many 5-year refinancing cycles will businesses have to go through as they try to justify their revenue losses to the banks?

Will you compensate affected businesses for loss of revenue due to construction?

Have you initiated studies of the likely economic impacts of construction (temporary effects)?

How will you mitigate those impacts?

How many local businesses will be seriously adversely affected by the impacts of construction even after mitigation?

Of those businesses, how many are qualifying small businesses?

How many are minority owned?

Joe Cortright and P-061 from David Madore. Many of the numbers in that report are disputed.

Pre-construction tolls may be implemented.

The local funding share would be raised through tolling the I-5 crossing. Tolls paid to cross the bridge could not be used on other projects in the region. This toll would not preclude other projects in the future from also raising revenues through tolling or other means.

An economic benefit cost analysis of the proposed project found it to be economically worthwhile.

The project has been identifying risks, and estimating the cost and schedule ramifications, through the Cost Estimation Validation Process (CEVP). The results are available from the project office.

P-012-013

Answers to some of your questions can be found in Chapter 4 of the FEIS. For example, the FEIS assumes that freight haulers (large trucks) will pay four times the toll of an automobile commuter. Other answers will only be found once the project has an investment-grade tolling analysis. You will not likely find a detailed estimate of the financial benefit to auto commuters. Because some trips are recreational, individuals differently value their time, and because of the variability of other factors, such an analysis has not been completed.

P-012-014

The FEIS describes current estimates of the duration of construction.

Constructability, including traffic staging, was considered in evaluating and refining alternatives. Traffic staging is a challenge but not a fatal flaw for the Selected Alternative.

P-012-014

How many are woman owned?

How many are disadvantaged?

How many are new or emerging?

Has the Small Business Administration been asked to provide input to any of your studies?

How are you complying with Executive Order 11518?

Where do you publish the studies?

Have your traffic engineers studied the effects of construction on I-5 for the period of construction on the region-wide transportation network? Will I-205 plug up for ten years?

Have your economists studied the economic impacts of construction on I-5 for the period of construction on the economy within the region-wide transportation network area? Will land values drop in Ridgefield?

Do you have a plan to coordinate construction on the CRC project with all other agencies so that access to Downtown Vancouver will not be further hampered?

Construction impacts have been considered as part of the alternative evaluation, project planning, and mitigation development. These will continue to be developed and refined during final design. Detours and reroutes will be determined during final design and construction planning.

Businesses will not be compensated for loss of business. See Section 3.4 of the FEIS discussion regarding measures to reduce such impacts on businesses during construction.

The project team surveyed businesses that would be directly displaced by the project to learn more about the demographics of owners, employees, and customers, but has not done such a detailed survey of the businesses that would not be directly affected. The project team has met with many of these business owners as well, and has afforded opportunities for all business owners to provide input on and learn about the project. The SBA has not been directly requested to provide information on the project's studies. Studies are made available on the project website or from the project office. The DEIS, FEIS, and technical reports were also made available in local libraries. The project has been consistent with the intent of Executive Order 11518.

The impacts of construction activities on regional traffic patterns is not expected to be significant, and significant diversion is unlikely given the conceptual traffic staging plans. Therefore, there is no need to conduct an analysis of temporary effects on property values in Ridgefield.

The project is committed to coordinating construction with all other agencies so as to minimize access, congestion, and other impacts. Detailed plans will be developed during final design and construction planning.

Historic Bridges

P-012-015 In what ways have you followed the spirit and letter of the National Historic Preservation Act of 1966?

What part did preservation of the historic bridges play in scoping, goal formulation, and the selection of alternatives?

What will happen to the bridges?

How did these decisions come about?

Will it take changes in laws to allow the bridges to be moved or destroyed?

Will there be a public debate?

What mitigation for impacts have been considered and identified for the historic bridges, the Academy property, and Vancouver National Historic Reserve?

Permits

P-012-016 The DEIS asserts that no permits will be required that might affect selection of the preferred alternative. Did you consider the number of privately owned parcels affected by right of way acquisition as being significant? Permits will be required of adjoining property owners for grade change, access restrictions, temporary construction, slopes, staging and stockpiling, acquisitions, etc.

P-012-015

Please see the response to comment P-012-010, above.

P-012-016

Individual property acquisition costs will be established through an independent appraisal process to ensure the owner receives the fair market value of the property. This process is governed by the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act). To date, the project has not conducted specific property valuations, which is necessary to determine the individual property acquisition cost. For the Draft EIS, the project team made general assumptions about the cost of acquiring property, based on a rough estimate of square footage, land use, possible demolition costs, etc. to compare the costs of alternatives in the Draft EIS, and made similar assumptions to inform the financial planning in the Final EIS. These estimates do not reflect what property owners will actually receive as compensation, and therefore were not distributed for review.

APPENDIX

Supplemental Environmental Impact Statement

P-012-017

40CFR1501.2 mandates that NEPA is to be applied early (first thing) in the planning process. Even before the DEIS and selection of alternatives, risks, obstacles, and possible adverse environmental impacts must be anticipated, identified, and accounted for during scoping.

40CFR1501.7(c) provides that *"An agency shall revise the determinations made under paragraphs (a) and (b) of this section if substantial changes are made later in the proposed action, or if significant new circumstances or information arise which bear on the proposal or its impacts."*

40CFR1502.9(c)1(ii) also provides for a Supplemental Environmental Impact Statement if *"There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts."*

P-012-017

Following is a brief summary of CRC's compliance with the cited sections of the code of federal regulations (CFR).

40 CFR 1501.2 and 1501.7(c): A notice of intent to prepare an EIS for the CRC project was issued in September 2005. That preceded discussions with the public on transportation needs in the project area and other concerns, followed by the development of a problem statement and the project purpose and need, as well as evaluation criteria. The process then moved into soliciting ideas, conducting screening, and other steps leading to a range of alternatives that was advanced into the DEIS. The DEIS was published in May 2008, and the selection of the LPA was made in July 2008. Subsequent coordination, analysis, and refinements led up to the FEIS in September 2011. Information that arose throughout this process was incorporated into the analysis and led to refinements to the proposed project. This is discussed in Chapter 2 and Chapter 6 of the FEIS.

40 CFR 1502.9(c): Please see the response to letter P-047-013.

DEAN SURVEYING, Inc.
717 NE 61st St., Suite 100
VANCOUVER, WA 98665
(360) 892 2600

October 18, 2010
Citizen Communications

How long can we hold out during construction?

P-012-018

I have been admonished for using highly emotive words to describe the CRC Project and its potential to harm Vancouver; words like: Ruin, bankrupt and monstrosity. I am asked "can't you see any good things coming to us from the CRC Project?" Well, yes, there is just as much potential for good as for harm and it may be a wash. But, the truth is, no one knows one way or the other. The Independent Review Panel pointed out very serious deficiencies and uncertainties in the project, as follows:

1) They don't know how much it will cost.
2) They don't know how long it will take to build
3) They don't know if there will likely be cost overruns or how large
4) They don't even know if the current design can be built on this site

Other than that, the Mayor is pretty sure it will bring "jobs, prosperity and a better quality of life to Vancouver." No one doubts his optimism.

One thing is certain, no benefits will accrue to Vancouver until after the bridge and all of the approaches are fully built. Perhaps, instead of asking the CRC how long will it take to build out the project, we should ask ourselves, "How long can we hold out during construction?"

"How long can Vancouver survive with I-5 all torn up?" What alternative routes will be available for people to get into Downtown if they are coming from, say Battle Ground, or Camas, or Ridgefield?" "Will students who live in Portland be able to get to classes at Clark College or WSU?" "Can the Amphitheatre survive even one summer with I-5 under construction?" "How many businesses will have to close before we throw in the towel?" "Will all those track hoes, orange cones, flaggers, jersey barriers, lane closures, muddy and irregular pavements, detours, and seemingly weekly reports of fatalities, deter some people from even attempting the trip into Vancouver?" "Can we ask Clark County, WSDOT, Burlington Northern, the Port of Vancouver, and even the City of Vancouver to postpone, for perhaps ten years, any other capital improvement construction projects along the alternative routes that might further hinder access to Downtown?"

How long can we hold out during construction? How long can we survive isolated? I do not know. If you know the answer to that question, please tell us. If you do not know, please find out. Please ask your financial staff to come up with a credible estimate. That way, when the CRC finally tells you how long the construction will last and how they plan to phase it, you will be able to respond – "fine, that will work for us," or "sorry, CRC, that is not good enough, we will all be dead by then."

Respectfully,

Robert Dean, President

P-012-018

Chapter 2 of the FEIS discusses how the project considered and responded to recommendations from the Independent Review Panel, and the Bridge Expert Review Panel.

There will be adverse impacts during construction, as described in Chapter 3 of the FEIS. Mitigation measures to reduce those impacts are also discussed in the FEIS. I-5 will not be closed. There could be short-term partial lane closures at times and some interstate access points would be unusable for many months during construction, but alternate access points will be available, as described in the FEIS.

Hines, Maurice

From: Robert Dean [robert@deansurveying.com]
Sent: Sunday, October 16, 2011 9:17 PM
To: Columbia River Crossing
Subject: CRC FEIS failed to address traffic staging
Attachments: trafficstagingsystemimpacts.pdf; ATT13307301.htm

The FEIS failed to address traffic staging during construction.

P-013-001 I sent this to Don Wagner and Thayer Rorabaugh earlier this year. I met with them both (at the Invitation of The Mayor and Jeanne Harris) in January to discuss construction impacts. I gave them the name and contact info for the WSU prof who conducted an economic study of the effects of closing the locks on the Columbia for 3 months. The DEIS told of likely "severe" disruption to commerce during 8 years of construction of the CRC. Does their $130 million in studies include the effects on people? No! Does the FEIS cover construction impacts? Briefly, they will warn us on which roads will be closed - like yelling incoming!

There is nothing in the FEIS about the effects of construction on I-205, SR-14, SR 500, surface streets, the airport, etc. They do not address how businesses on Main Street can survive while Washington and Broadway are torn up. They do not have any independent economic studies - not even educated guesses. Not even uneducated guesses. Certainly not the same detailed knowledge as they on the effects of construction on fish.

Sent from my iPhone

Begin forwarded message:

> **From:** "Robert Dean" <robert@deansurveying.com>
> **Date:** December 11, 2010 4:35:38 PM PST
> **To:** wagnerd@columbiarivercrossing.com
> **Cc:** Jeanne.Harris@cityofvancouver.us
> **Subject: CRC traffic staging system-wide impacts**
> **Reply-To:** robert@deansurveying.com
>
> Don,
>
> Thank you for agreeing to meet with Jeanne and me this coming Jan 3. I do appreciate your time and understand that you could not meet this past week.
>
> To help you prepare for our meeting I have modified the letter I wrote to Tom Warne and addressed it to you directly. I would like your take on the letter before I forward it to the parties Tom suggested (see below).
>
> Thank you for your work. You are blessed.
>
> Have a very merry Christmas with your family.
>
> Robert Dean, President
> Dean Surveying, Inc.
> 717 NE 61st St., #100

P-013-001

There was no quantitative study of how traffic affected by construction activities would in turn indirectly affect business profit and loss. However, construction impacts for each element of the environment are discussed at least qualitatively, and in some cases quantitatively, in each sub-section (e.g., 3.1 Traffic, 3.2 Aviation and Navigation, etc.) of Chapter 3 under the sub-heading "Temporary Effects". Mitigation for temporary effects is also discussed. There is a discussion about the approach to reducing the impacts to businesses during the construction of the light rail alignment on Washington and Broadway in Section 3.4.5. Impacts are further detailed in the technical reports that the FEIS is based on.

Vancouver, WA 98665
(360) 892 2600
fax (360) 256 1156

----- Original Message -----
From: "Harris, Jeanne" <jeanne.harris@cityofvancouver.us>
Sent: Wed, December 8, 2010 10:10
Subject: RE: CRC traffic staging

P-013-001

I've got January 3 at 1:30 scheduled with Don and you and me at CRC. Does that work for you?

Jeanne

From: Robert Dean [robert@deansurveying.com]
Sent: Friday, December 03, 2010 9:42 AM
To: Harris, Jeanne
Subject: Fw: CRC traffic staging

fyi

----- Original Message -----
From: "Robert Dean" <robert@deansurveying.com>
Sent: Fri, December 3, 2010 9:37
Subject: CRC traffic staging

Excellent!

I'm sure Mr. Wagner will value your guidance and advice.

As for timing - nothing should proceed to construction until the study is done.

Robert

----- Original Message -----
From: "Casavant, Ken" <casavantk@cahnrs.wsu.edu>
Sent: Fri, December 3, 2010 9:21
Subject: RE: RE: CRC traffic staging

I don't know if we have the expertise to do the study since I am not sure of the scope, timing and implementation, but you can pass along our name as someone that is interested and could help in any such study. Ken

---

From: Robert Dean [mailto:robert@deansurveying.com]
Sent: Friday, December 03, 2010 9:01 AM

To: Casavant, Kenneth
Subject: Fw: RE: CRC traffic staging

P-013-001

Ken,
The AP article was published in The Columbian this morning.

The draft environmental impact statement of the Columbia River Crossing made no mention of the economic impact on surrounding communities of the construction itself. I pointed that out to the Mayor of Vancouver, Tim Leavitt, and he asked me to write the attached letter to the Independent Review Expert Bridge Panel, Tom Warne, Chair. The IRP was appointed directly by the governors at the request of the mayors and county commissioners.

Council Member, Jeanne Harris, arranged a meeting with Don Wagner, Director of CRC. I intent to ask him to convene an economic study of those impacts. Is it OK to suggest that WSU is equipped to conduct that study. May I pass on your name?

Best regards!

Robert Dean, President
Dean Surveying, Inc.
717 NE 61st St., #100
Vancouver, WA 98665
(360) 892 2600
fax (360) 256 1156

----- Original Message -----
From: "Tom Warne" <twarne@tomwarne.com>
Sent: Mon, November 29, 2010 8:04
Subject: RE: CRC traffic staging

Robert-I would suggest that you send this to the CRC since they are managing the project and the BRP is only a part of that process. You may want to send a copy to Director Garratt at ODOT and also Secretary Hammond at WSDOT.

My only caution comes from working on many very large projects where traffic management is an issue and needs to be addressed. There are many solutions and the optimal one will come from substantial modeling. Modeling will show where the cars will go, how best to invest in temporary measures and what the best combination of strategies is. Those signing the letter probably aren't familiar with the detail that goes into the process and may be actually signing on to something that is not the optimal solution. Perhaps you could frame it as "one option" that should be considered and that the project needs to find the optimal solution that will allow the public to travel

P-013-001

effectively in the region during construction. Just a thought. You are obviously welcomed to do whatever you want.

Thanks,

Tom

Thomas R. Warne, PE

Tom Warne and Associates

9874 S. Spruce Grove Way

S. Jordan, UT 84095

801-302-8300

801-302-8301 fax

From: Robert Dean [mailto:robert@deansurveying.com]
Sent: Saturday, November 27, 2010 12:54 PM
To: Tom Warne; jshowers@ch2m.com
Cc: steve_stroh@urscorp.com; jvachon@pubknow.com
Subject: RE: CRC traffic staging

Thank you, Tom!

I have sent the letter about traffic staging out to several friends and elected officials. It usually strikes a chord with them. Can you suggest who should receive the letter? Should it go to the CRC?

I will send out for endorsements as follows:

The undersigned recognize a need to expand the capacity of the interstate crossing system in Clark County, Washington, before temporarily restricting its capacity during construction of the Columbia River Crossing Project.

Best regards,

Robert Dean, President
Dean Surveying, Inc.
717 NE 61st St., #100
Vancouver, WA 98665
(360) 892 2600
fax (360) 256 1156

----- Original Message -----
From: "Tom Warne" <twarne@tomwarne.com>
Sent: Sat, November 27, 2010 5:05
Subject: RE: CRC traffic staging

P-013-001

Robert-thanks for sending this along. We will distribute it to the members of the BRP. Managing traffic during construction of large urban projects is a challenge all by itself-besides the actual construction. Many have done it well and you cite several examples. While the specifics of the traffic management strategies that the CRC eventually employs are outside of the prevue of the panel we are definitely looking at it from a holistic standpoint as manl aging traffic during construction and the bridge itself cannot be separated.

Thanks again for your continued input and insights.

Tom

Thomas R. Warne, PE

Tom Warne and Associates

9874 S. Spruce Grove Way

S. Jordan, UT 84095

801-302-8300

801-302-8301 fax

From: Robert Dean [mailto:robert@deansurveying.com]
Sent: Wednesday, November 24, 2010 12:16 AM
To: jshowers@ch2m.com
Cc: Tom Warne; steve_stroh@urscorp.com
Subject: CRl C traffic staging

Joe,

I have taken a shot at addressing the traffic staging problem. Please pass this attachment on to the other panel members and see if the concerns I raise have been looked at adequately.

Thank you!

Robert Dean, President
Dean Surveying, Inc.
717 NE 61st St., #100
Vancouver, WA 98665
(360) 892 2600
fax (360) 256 1156

----- Original Message -----
From: "Robert Dean" <robert@deansurveying.com>
Sent: Wed, November 3, 2010 15:12
Subject: CRC context sensitive

Joe,

P-013-001

Thank you for your question to Kevin Peterson about traffic staging. That question has been! plaguing me about the CRC Project, also. I cannot see how you can stage traffic around the torn up I-5 for perhaps 7 years and not bankrupt Downtown Vancouver and Jansen Beach. That's why I suggested the question is not, "How long will it take to build the project?" but "How long can we survive while it is being built?"

That is what struck me about Kevin's proposal - it was context sensitive.

If the Independent Review Panel had picked up on the context sensitive mandate of bridge design they would have worded their criticisms differently. For example:

1) Not, "How much will it co! st?" but "How much can we afford?"

2) Not, "What likelihood of cost overruns?" but "Can the local community afford to pay tolls?"

3) Not, "How will it be funded?" but "Will the taxpayers approve?"

4) Not, "Did we take public input?" but "When should we hold the vote?"

5) Not, "How large is the footprint?" but "How many property owners will be affected?"

P-013-001

Kevin's proposal looked more sensible to me than the CRC model. The only drawback for me is the traffic staging problem, or more accurately, the effect of construction on the local communities.

My preference would be to build a third bridge downstream to act as a detour while they retro-fit the iconic, historic, Interstate Bridge for seismic safety.

Best!

Robert Dean, President
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Vancouver, WA 98665
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fax (360) 256 1156

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DEAN SURVEYING, Inc.
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(360) 892 2600

December 11, 2010
CRC Traffic Staging Problem

Potential Adverse Impacts on Downtown Vancouver Commerce



DEAN SURVEYING, Inc.
717 NE 61st St., Suite 100
VANCOUVER, WA 98665
(360) 892 2600

December 11, 2010

Don Wagner
700 Washington Street, Suite 300
Vancouver, WA 98660

Re: Traffic Staging for Downtown Vancouver

Mr. Wagner,

P-013-002 Thank you for the opportunity to express concerns about some of the potential negative impacts of the Columbia River Crossing Project. The CRC is by far the most significant public works capital improvement project for our region since construction of PDX. We all anticipate the tremendous economic benefits promised for considerable expenditures of public funds.



-Boston Big Dig-

However, no benefits will accrue until construction is completed. Hence, our more immediate concern must be for the impacts of those construction activities on our communities.

The City of Vancouver, when it adopted the Locally Preferred Alternative, stipulated the need to

P-013-002

Please see the response to your comments above and your other letters (P-012, P-014, and P-015). See also the discussion of alternatives, including other river crossing locations considered, in Chapter 2 of the FEIS (particularly Section 2.7).

P-013-002

mitigate for disruption to commerce during construction of the CRC project.[1] The City recognized that a project of this size and complexity will require several years of construction activity which could impose severe hardships on businesses and the community.

Where engineers ask, "How long will it take to build the bridge?" we ask, "How long can we survive during construction?" How long can Downtown Vancouver hold out while 5 miles of I-5 freeway is torn up? Will the Hilton Hotel survive financially? Will emergency vehicles have ready access in the construction zone? Context sensitive design demands answers to these questions.



Context

Without the Interstate Bridge, Vancouver would be a quaint village beside the river. The Central Business District grew and flourished because of Highway 99, I-5, and the bridge. Now, we have outgrown the historic Interstate Bridge and we notice its limitations more than ever. Any closure or impediment due to lifts, traffic accidents, maintenance, police action, Secret Service inspections, or congestion is acutely felt and hugely expensive. So far, we have not had to suffer prolonged closures or restrictions such as may be anticipated with construction of the CRC Project.

I-5 is the carotid artery of Vancouver. It runs along the eastern edge of the Central Business District. There is no other road access to the CBD except from or across I-5. There is no road bridge across the Columbia River to the west of Vancouver.

To the west of the CBD the Port of Vancouver and Fruit Valley Industrial Area depend on access to I-5 for trucks, deliveries, suppliers, employees, etc. If 70% of their traffic goes south they must impose on Mill Plain and Fourth Plain, both already at capacity, to access I-5 on the other side of town. The Industrial West already has pressing needs for alternative access routes[2].

Vancouver is served by only two road bridges – on I-5 and I-205. Both bridges are currently at capacity during peak hours. That means that if either bridge is closed or impeded the other cannot make up the deficiency.

---

1 Resolution M-3663 page 2 of Attachment A adopted July 7, 2008.

2 See July 22, 2010 letter from Clark County Board of Commissioners to RTC attached in Appendix

P-013-002

I-205 provides a bypass around Portland for through traffic on I-5. However, the Glen Jackson Bridge has more far reaching significance for Vancouver. It provides alternative access to Downtown Portland by way of I-84 and it connects all of Vancouver and Clark County directly to PDX. East Vancouver, Camas, Washougal, Battle Ground, Ridgefield and the region have grown because of the Glen Jackson Bridge. If diversions from I-5 during CRC construction impinge on I-205 the negative economic impacts will be felt region-wide.

System-wide Considerations

In April 2003, ODOT commissioned an economic study of the transportation network in our region. That study identified critical choke points crossing the Columbia River. It recognized an immediate capacity for two additional highway crossings.

In April 2008, the RTC Transportation Corridor Visioning Study piggy backed on the earlier DEA/ODOT study and identified an additional four possible crossing points with useful arterials throughout Clark County.

In May 2008, the CRC issued its Draft Environmental Impact Statement. The DEIS did not build on the two previous studies. Chapter 2 did not mention alternative crossing points as options. Chapter 3 did not mention possible negative economic impacts on commerce of construction itself. The DEIS failed to recognize a need to expand the capacity of the interstate crossing system in Clark County before temporarily restricting its capacity during construction.

Independent Studies

Each study should trigger a go/no-go decision at CRC. To maintain credibility, in case of a "go" decision, the CRC should commission its studies from sources with no, or minimal, interest in the outcome. Washington State University is currently studying the economic impacts of 3 months of lock construction along the Columbia River.[3] To date, no similar studies have been conducted on the economic impacts of 5 years of construction along I-5 through Downtown Vancouver. No construction should proceed until independent studies are completed and evaluated.

Detour Needed

As a condition of endorsement of the Locally Preferred Alternative, the City of Vancouver mandated that the CRC final design must satisfactorily address construction mitigation identified in Attachment A of its Resolution M-3663[4]. The City asked the CRC to consider pre-constructing alternative dedicated truck routes as an example of how their concerns might be addressed.

---

3 http://www.columbian.com/news/2010/dec/02/wsu-to-study-closure-of-rivers-locks/

4 Resolution M-3663 page 7.



P-013-002

Each of your design consultants has experience designing traffic staging plans for such projects as Tacoma Narrows Bridge, Boston Big Dig, Denver Airport, I-25 in Denver, I-15 in Salt Lake City, and the Sunset Highway in Portland during construction of light rail. You know that to avoid back-ups it is not enough to allow traffic to wind its way through a construction zone. The only satisfactory traffic staging solution is a separate detour, a fully functioning alternative route.

Alternative Routes

Vancouver has pent up capacity for a total of four (4) bridges:[5]

1) Interstate
2) Glen Jackson
3) Bi-State Industrial Corridor[6]
4) 192nd Ave. Eastside Crossing[7]

Glen Jackson and Interstate are already at capacity and neither can serve as a detour while the other is worked on. Before either Glen Jackson or Interstate is worked on one or other of the alternative routes, Bi-State Industrial Corridor or an eastside crossing, must be in place to serve as a detour during construction.

Bi-State Industrial Corridor Option 4

P-013-003

The most studied crossing option west of Vancouver, the Bi-State Industrial Corridor Option 4, is the most promising detour route during construction of the CRC Project. It is nearest to the CBD of Vancouver and would serve to divert truck traffic around the impacted areas.

Any chosen route will have its own obstacles. The trick is to find one that has no fatal flaws. The

---

[5] Oregon Department of Transportation: April 2003; Regional Economic Effects of the I-5 Corridor/Columbia River Crossing Transportation Choke Points, page 6 Table 1 Comparison of River Crossings in Selected Metropolitan Areas of Similar Size. http://www.columbiarivercrossing.org/FileLibrary/NonCRCRelatedDocuments/I-5_Partnership_Regional_Economic_Effects.pdf

[6] Southwest Washington RTC Transportation Corridor Visioning Study Report, April 2008; http://www.rtc.wa.gov/reports/vision/AppendixE.pdf

[7] Ibid

P-013-003

A "Bi-State Industrial Corridor" was one of the alternative crossing locations considered during CRC scoping, as discussed in Section 2.7 of the FEIS.

P-013-003

Third Harbor Tunnel in Boston serves as an example of a plan with a fatal flaw – it was scrapped because it was deemed too disruptive to a portion of Downtown Boston.

Please consider Bi-State Industrial Corridor Option 4 as a workable solution to the traffic staging problem with the Columbia River Crossing Project. Visit http://thirdbridgenow.com/ to see more detail of some of the possibilities.



-Thirdbridgenow.com – Northern Bridge-

Holistic Overview

Your professional team of designers will come up with the optimal traffic staging plan within the constraints of their model. However, you might want to revisit all of the available crossing points in the RTC studies. Viewed more holistically, options may emerge to build two new crossings, and renovate the two existing serviceable bridges, for near the same costs as are currently promulgated for the CRC Project.

Best regards,

Robert Dean, President

P-013-004



BOARD OF CLARK COUNTY COMMISSIONERS

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CLARK COUNTY
WASHINGTON

Regional Transportation Council
RECEIVED
JUL 27 2010

July 22, 2010

The Southwest Washington Regional Transportation Council (RTC)
c/o Ms. Molly Coston, Chair
1300 Franklin Street, 4th Floor
Clark County Public Service Center
Vancouver, Washington 98666-1366

RE: Fourth Plain Boulevard Becoming a Major Freight Arterial/Corridor

Dear Chair Coston and Council Members:

The Clark County Board of Commissioners has been approached by members of the Shumway Neighborhood Association regarding the increasing volume of freight through established residential neighborhoods.

The Shumway Neighborhood Association has been actively working with the Arnada Neighborhood Association, Hough Neighborhood Association, Fruit Valley Neighborhood Association and the Carter Park Neighborhood Association to prevent Fourth Plain Boulevard from becoming a major freight arterial through these established neighborhoods.

While Clark County understands that the area in question is under the jurisdiction of the city of Vancouver, the concerned home and property owners are also located in Commissioner District 3. Thus, their outreach to the Clark County Board of Commissioners.

The Board of Commissioners respectfully asks RTC to include in its current work program a comprehensive freight access study of the entire transportation network west of and in connection with Interstate-5. We further respectfully ask all RTC member organizations to understand these well established residential neighborhoods' concerns for their livability, not to mention potential affects on home and/or property value if Fourth Plain Blvd.'s designation should change. We would hope (1) RTC staff will actively include and work with all of the neighborhood associations and (2) that this work would be completed before any public conversation about the proposed change in Fourth Plain's designation.

Sincerely,

Steve Stuart, Chair — Tom Mielke — Marc Boldt

1300 Franklin Street • P.O. Box 9000 • Vancouver, WA 98666-9000 • tel: [360] 397-2232 • fax: [360] 397-6058 • www.clark.wa.gov

P-013-004

Project staff would be more than willing to collaborate on a freight access study for west Vancouver. The project has done a considerable amount of analysis of freight movement in Vancouver. The project will improve traffic conditions in Shumway and elsewhere in Vancouver. Motorists who now avoid the congested Interstate are using local streets, and will return to I-5 when the congestion is relieved.

Hines, Maurice

From: Robert Dean [robert@deansurveying.com]
Sent: Sunday, October 16, 2011 9:37 PM
To: Columbia River Crossing
Subject: FEIS failed to address my concerns

Categories: Orange Category

P-014-001

The FEIS failed to address concerns I raised in January 2011 at at meeting with Don Wagner and Thayer Rorabaugh.

> This was their response. On construction mitigation they pledged to keep 3 lanes open throughout. That would be possible if people heed the admonition to choose alternative routes.
>
> Ken Cassavant was the prof I contacted. I have not heard of his findings.

Robert Dean
7101 NE 74th Ave.,
Vancouver WA 98662
(360) 892 2600

Sent from my iPhone

Begin forwarded message:

> **From:** "Wagner, Don" <WagnerD@wsdot.wa.gov>
> **Date:** January 4, 2011 3:09:05 PM PST
> **To:** <robert@deansurveying.com>, <leavitt@cityofvancouver.us>
> **Cc:** "Rorabaugh, Thayer" <thayer.rorabaugh@cityofvancouver.us>, "Holmes, Eric" <eric.holmes@cityofvancouver.us>, <jeanne.harris@cityofvancouver.us>, <wagnerd@columbiarivercrossing.com>
> **Subject: RE: meeting with Don Wagner**
>
> Robert, thank you taking the time to discuss your thoughts on the CRC project with me yesterday. After reading your memo to Mayor Leavitt I thought it best to clarify a couple of issues in that memo.
>
> First, in a couple of places you interpreted my comments related to the work of Bridge Expert Review Panel (BRP) to mean that I felt the Panel or the CRC project might be going with the "Kevin Peterson" design or that I don't believe anything will be built. That was not my intent. My comments were to convey that the BRP is looking a many different options for bridge design and alignment and at this time I don't know what they will ultimately put in their report. The BRP report will be processed through the local partners and ultimately will inform what bridge types are included in the FEIS. While I may not know which bridge

P-014-001

It is not clear what Mr. Dean believes the FEIS failed to address in this portion of his letter and the letter from Mr. Wagner to him. It is also unclear why Mr. Dean believes that three lanes on I-5 can be kept open during construction only if people choose alternative routes. Regardless, the project is committed to keeping three lanes open in both directions during construction. As the construction plans are further developed, we will work with interested citizens and neighborhoods on the specific details.

P-014-001

type will finally be built, I believe we were going to take the CRC project through to construction.

In your seventh paragraph you credit me with the following quote; "Tell it to the Columbian editorial board." While I agree that a comment very similar to this was made at the meeting, it was not made by me. As I was not the one who made the statement, I suggest you check with the person who made the statement on his exact wording and context.

In the eighth paragraph you indicate that I was meeting with the feds to find out who was the lead agency on the project. There is no question as to which Federal agencies are the lead agencies on this project. The Federal Transit Administration and the Federal Highway Administration (both divisions of the US Department of Transportation) are the lead agencies. They published the Draft Environmental Impact Statement in 2008 and they will publish the Final Environmental Impact Statement. They will ultimately issue the Record of Decision on the project.

In the ninth paragraph you indicate that my reference to the project being an issue in the last election might be "alluding to the election of Jaime Herrera I think". My comment was much broader than that. Several candidates at the local, state and federal level on both sides of the Columbia included positions on the CRC project in their campaigns.

Lastly, the BRP will be holding their last group work session on January 18 and 19. Their report is not scheduled to be delivered until January 31, 2011.

I hope this helps to better understand comments I made at our meeting.

Don Wagner

Columbia River Crossing

From: Robert Dean [mailto:robert@deansurveying.com]
Sent: Monday, January 03, 2011 6:45 PM
To: leavitt@cityofvancouver.us
Cc: Rorabaugh, Thayer; Holmes, Eric; jeanne.harris@cityofvancouver.us;

wagnerd@columbiarivercrossing.com
Subject: meeting with Don Wagner

January 3, 2011

P-014-002

Today I met with Don Wagner at his office between 1:30 and 2:30. Jeanne Harris arranged the meeting and was there briefly to introduce us. She had to leave for another appointment and so she asked Thayer Rorabaugh to stand in for her. Thank you Jeanne!

Don Wagner led off with assurances that he had read my previous letter on traffic staging and they were addressing my concerns. Thayer, also, had been forwarded from Tim Leavitt a similar letter which he had read. Thayer gave examples from past projects of how they work with local businesses and do their best for them. I expressed thanks to Tim Leavitt and the City for asking the right questions and for Resolution M3663. Don and Thayer said they are going through the list of caveats in the LPA to make sure they are addressing them.

I acknowledged their success with previous projects (Salmon Creek and Delta Park) and asked if they would do specific studies on this one to protect small businesses; especially since this project will last up to nine years. I mentioned legal (Executive Orders) and moral imperatives to look out for small businesses. I explained the 5 year refinancing problem building owners face and used my building in Hazel Dell as an example.

I gave Don the newspaper article on the WSU study of economic impacts of reconstruction of the locks and also Ken Casavant's bio and contact info. He seemed interested in pursuing my request.

I mentioned that the DEIS attributes an estimated $8 million annual savings to the trucking industry in 2030 with build out of the new bridge. Is that enough savings to justify $4 billion expenditure? Don responded that that was only for one aspect of benefits. I suggested that commuters would have no net benefit because we will be paying for it with tolls. Don said we would only be paying a third (let's see, $1.5 billion capital plus interest plus collection costs plus cost overruns =?).

I asked if there was a cost/benefit analysis for the project. No. Was he aware that Steve Stuart had asked for one for tolls? Yes. It has not been done yet because they do not have a final design (he implied that they might be going with the Kevin Peterson design).

We talked about the need for an SEIS and the political inertia involved. They both are aware of sunk costs and the benefits of spending money during design phase rather than as cost overruns later. Don Wagner said, "Tell it to the Columbian editorial board."

P-014-002

Please see the responses to these comments in Mr. Dean's letter (P-012-001 and P-012-002).

P-014-002

I had mentioned the need for an SEIS to Tom Warne earlier. He was very circumspect. I got the impression at this meeting that it is being discussed. Don Wagner said he is meeting this afternoon with the feds to find out who is the lead agency on the project. I suspect Tom Warne wants to know if an SEIS will be called for if they switch to the Kevin Peterson design.

Don mentioned that there are hundreds of ways for the project to fail. Most prominent causes are funding and political will. He mentioned voting (on light rail) and the last elections (alluding to the election of Jaime Herrera I think). He seemed melancholy to me and resigning himself to imminent failure of funding. He exchanged glances with Thayer as if they had just been talking about it before I came.

I said I did not know of anyone who wanted to see the project fail. Don disputed that. I said I am on the email lists and some want to see light rail fail and some want to see tolls fail but we all want a better crossing that we can afford and that does what it's supposed to do.

Don said several times things like "If this gets built" and "If they build this design" as if he has doubts that anything will be built and if anything it will be Kevin Peterson's design. He said the IRP Expert Panel will be reporting January 19.

We talked about the original scoping and that there was no justification in the record for rejecting the Bi-State Industrial Corridor. I suggested the need for a Supplemental Environmental Impact Statement going all the way back to scoping and goal setting. The number 1 goal should have been to relieve the choke points to commerce on the West Coast of the US and allow future growth. If the Bi-State Industrial Corridor failed question 6 in Step A Screening Report then did they ask the right questions?

Don mentioned that a westerly arterial, west of the lake, to Ridgefield was rejected about 20 years ago. I suggested that was a lot of freeway to build through a wilderness.

We talked about preserving the historic bridges. Don said they are spending tens of millions to mitigate for the loss of 1.5 acres of the Historic Preserve. The bridges themselves are doomed. They are seen as a safety hazard by WSDOT (legal justification for destroying them) and the bridge lifts are a nuisance to Downtown commerce.

We talked about retro-fitting the Interstate Bridges for seismic safety. Don said the $300 million cost was for the first stage only – piers.

P-014-002

Don and Thayer both dispute that the RR bridge can be raised. They say for 90' clearance above the water and at 2% grade the RR would land too far North to make the Vancouver yards. My preliminary calculations from the GIS say it would land under the Mill Plain Overpass.

I suggested they redo the RR bridge and build the Bi-State Industrial corridor with light rail, bike paths, etc. and have it paid for by the RR, Coast Guard and Ports rather than on the backs of Vancouver commuters. They scoffed that the RR, Coast Guard or Ports would pay for anything.

Thayer said most of the Port traffic goes East and there is little truck traffic between ports. I did not have a chance to dispute that as we moved on to other things.

Don said the rumor that they hope to toll both crossings (I-5 and I-205) is not true. He wishes it would go away. He did say they might consider pre-construction tolling as they are doing in Seattle. I suggested that was a good idea and that they should test their financial and traffic projections immediately before committing the $4 billion. I asked if any law changes were required for tolls. He said no federal changes for I-5 (not so for I-205) and some changes for Oregon and Washington.

I gave Jeanne Harris and Don Wagner signed hardcopies of the attached donwagnerletter.PDF

Robert Dean, President
Dean Surveying, Inc.
717 NE 61st St., #100
Vancouver, WA 98665
(360) 892 2600
fax (360) 256 1156

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Hines, Maurice

From: Robert Dean [robert@deansurveying.com]
Sent: Sunday, October 16, 2011 9:44 PM
To: Columbia River Crossing
Subject: CRC failed to take public input on FEIS

I sent this to my congressional representative.

P-015-001

RCW 43.52.383
Compliance with open public meetings act.
(1) The legislature intends that the business and deliberations of joint operating agencies conducted by their boards of directors, executive boards, committees and subcommittees be conducted openly and with opportunity for public input.

(2) The board of directors, executive board, and all committees or subcommittees thereof shall comply with the provisions of chapter 42.30 RCW, in order to assure adequate public input and awareness of decisions.

I wondered how our local politicians would approve the FEIS if it detailed how local businesses would suffer "severe disruption" during 9 years of construction. How would they get reelected after condemning so many Downtown merchants to certain ruin?

Apparently, the CRC came to their rescue. They must have offered the 6 agencies the opportunity to approve the FEIS before it was finished or published so that the elected officials would not have to take personal responsibility for their actions.

C-Tran is a joint agency made up of elected representatives from Clark County and City of Vancouver. If the three City representatives on that subcommittee collude to approve the CRC FEIS they have to make their decision openly and with public input. They did not.

The City Council approved the unpublished and unfinished FEIS at a workshop June 27. No public input.
http://www.columbian.com/news/2011/jun/27/vancouver-city-council-discuss-crc-bridge/

The C-Tran board approved the unpublished and unfinished FEIS August 9 with the unanimous consent of the City of Vancouver 3-member sub-committee. Jeanne Stewart had been previously reprimanded for voting her own conscience on the C-Tran Board. Jack Burkman stated on the Columbian Forum that the three council members had agreed to vote for the unpublished FEIS at a workshop (presumably June 27).

http://www.columbian.com/news/2011/aug/09/c-tran-board-approves-crc-impact-statement/

Apparently, CRC officials have conspired with officials of the 6 local agencies to shortcut public input.

Please appoint an independent outside investigator to ensure that the letter and spirit of all laws are being complied with at the CRC and our local agencies.

Thank you for your work on our behalf.

Robert Dean, President
Dean Surveying, Inc.
717 NE 61st St., #100
Vancouver, WA 98665
(360) 892 2600
fax (360) 256 1156

P-015-001

The FEIS and associated technical reports describe the impacts to businesses during construction. For more information, see Chapter 3.4 of the FEIS and the Economics Technical Report.

Significant work has gone into developing the CRC project, including an ongoing public involvement effort. The public involvement program includes numerous advisory groups to ensure that the values and interests of the community are reflected in project decisions. These groups include representatives of public agencies, businesses, civic organizations, neighborhoods and freight, and commuter and environmental groups. Feedback from the general public and advisory groups has been generally supportive of the project, including support for the transit, bicycle, pedestrian, highway, interchange, and financing elements of the project. See Chapter 2 (Section 2.7) of the FEIS for more discussion on the process used to develop project alternatives and select a Locally Preferred Alternative.

Following the close of the 60-day DEIS comment period and the selection of an LPA, a 10-member governor-appointed panel was formed to advise the Oregon and Washington DOTs on project development for the CRC project. The Project Sponsors Council (PSC) was charged with advising the project on completion of the FEIS, project design, project timeline, sustainable construction methods, consistency with greenhouse gas emission reduction goals, and the financial plan, as well as the number of lanes on the bridge. The PSC made recommendations after considering technical information, receiving input from relevant advisory groups, and reviewing public comments. See Chapter 2 (Section 2.7) of the FEIS for details on the PSC's recommendations, and Chapter 6 (Public Input on the Draft EIS) and Appendix B (Public Involvement) of the FEIS for a description of public involvement activities that occurred after the DEIS was published.

http://www.columbian.com/news/2011/sep/12/in-our-view-progress-by-crc/

Ryan,

P-015-001 The Independent Review Panel called for more and better public input into the CRC. Jamie did also. Local officials have defied those instructions and now have violated Washington law.

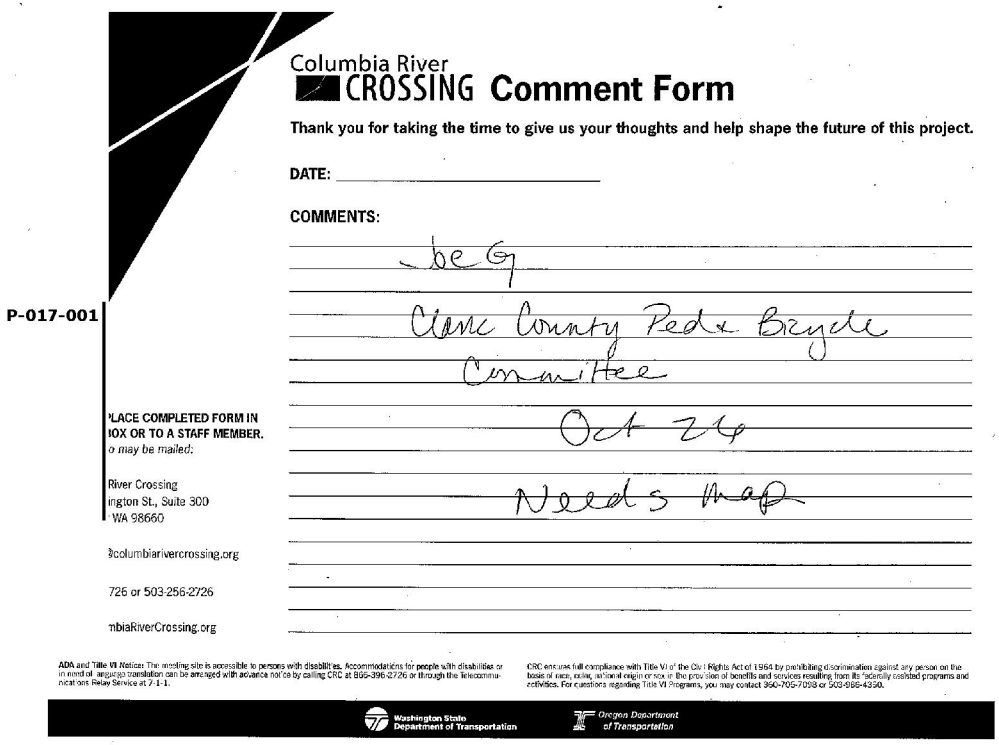
From: Dennis [dennise219@comcast.net]
Sent: Friday, September 16, 2011 5:52 PM
To: Columbia River Crossing
Subject: FEIS email notification
Categories: Orange Category

P-016-001 I don't care if they ever put in a bridge in, they screw up all the roads and never obey the traffic laws. In other words stay on your side of the river.

P-016-001

Thank you for your comment. All comments received on the FEIS are shared with CRC project staff and included in the Record of Decision document.

P-017-001



Columbia River CROSSING **Comment Form**

Thank you for taking the time to give us your thoughts and help shape the future of this project.

DATE: _____

COMMENTS:

be G

Clark County Ped & Bicycle Committee

Oct 24

Needs map

PLACE COMPLETED FORM IN BOX OR TO A STAFF MEMBER.
o may be mailed:

River Crossing
ington St., Suite 300
WA 98660

@columbiarivercrossing.org

726 or 503-256-2726

mbiaRiverCrossing.org

ADA and Title VI Notices: The meeting site is accessible to persons with disabilities. Accommodations for people with disabilities or in need of language translation can be arranged with advance notice by calling CRC at 866-396-2726 or through the Telecommunications Relay Service at 7-1-1.

CRC ensures full compliance with Title VI of the Civil Rights Act of 1964 by prohibiting discrimination against any person on the basis of race, color, national origin or sex in the provision of benefits and services resulting from its federally assisted programs and activities. For questions regarding Title VI Programs, you may contact 360-705-7098 or 503-986-4350.

Washington State Department of Transportation

Oregon Department of Transportation

P-017-001

Please contact the project office for maps and future meeting requests. There are now very detailed maps online, but we can print/plot a large one for your future use.

Hines, Maurice

From: Allbefit@aol.com
Sent: Wednesday, September 21, 2011 10:37 PM
To: Columbia River Crossing
Subject: CRC and the Media Lie:

P-018-001

CRC Project: a few years ago two states spent one million dollars on this project. I spoke before Merto Council and asked to give me an opportunity and promised in a few days to improve traffic without big spending. My Offer was rejected.
Till today states spent $14.7 million on it.
And the media: the Oregonoan constantly continue to lie and continue to make politicians who paid it, named Cornilles a "leading candidate". Leading candidate? There was a forum of candidates, and the people shaked my hand for what I stand up, but not Cornilles hand, who support CRC I-5 Bridge. I oppose this bridge,
First, there is no need to replace I-5 Bridge: I promise to improve traffis.
No one taxpayers dollar will be spend on this project till I will improve traffic.
Second: yes, it would be good to create 2,000 jobs, but not on this, but other project, but again "but": where money will come from? Borrow from China, Russia and Jupan? NO!
//

To: We the People Pavel Goberman - Candidate (R) for US Repr. 1st Cong. Distr.
Campaign: "I Promise To Create Millions Jobs And Balance Budget".
P.O. Box 1664 FEC ID # C00487249
Beaverton, OR 97075 FEC OR ID # H 6 OR 01209
(503) 643-8348
www.getenergized.com and on left click on: **Vote**
allbefit@aol.com getfit@getenergized.com

STATEMENT / REASON WHY I'M RUNNING FOR US CONGRESS:
Special Primary Election is on November 8, 2011

I don't see any one better than me could help this state and nation, and I have a concrete plan to help Oregon State and nation, and will be much beneficial than army of "experienced" US Senators, Congressmen, President and other candidates, who say: "We need, We must". I have an education, life and business experience. I'm honest, incorruptible (no not accept any "donation, contribution"), with faith, integrity and high moral principles, will not be a puppet in hands of donors and will not lose my dependency on We the People. For Government By and For the People.
As elected US Representative I promise to help: 1) In a few months to create a few thousands jobs in Oregon and a few millions jobs in the USA without raising taxes. Stop our dependency of foreign oil or it could cripple this country. 2) In a very short time to balance national budget, that saved nation $1 Billion a year paid on deficit interest, and even create a surplus. Debt is a terror against our country: Amendm. XIV, Section 4. 3) Save nation a few billions dollars on the health care.

1

P-018-001

Preferences for specific alternatives or options, as expressed in comments received before and after the issuance of the DEIS, were shared with local sponsor agencies to inform decision making. Following the close of the 60-day DEIS public comment period in July 2008, the CRC project's six local sponsor agencies selected a replacement I-5 bridge with light rail to Clark College as the project's Locally Preferred Alternative (LPA). These sponsor agencies, which include the Portland City Council, Vancouver City Council, TriMet Board, C-TRAN Board, Metro Council, and RTC Board considered the DEIS analysis, public comment, and a recommendation from the CRC Task Force when voting on the LPA.

With the LPA, new bridges will replace the existing Interstate Bridges to carry I-5 traffic, light rail, pedestrians, and bicyclists across the Columbia River. Light rail will extend from the Expo Center MAX Station in Portland to a station and park and ride at Clark College in Vancouver. Pedestrians and bicyclists would travel along a wider and safer path than exists today.

For a more detailed description of highway, transit, and bicycle and pedestrian improvements associated with the LPA, see Chapter 2 of the FEIS.

P-018-001

4) Improve heavy traffic on all national highways and in cities. I will save $4 billion on Columbia Bridge, 5) Elect US Judges and Attorneys, but not appoint them, as it is now, that is a rape of our Constitution, 6) With this rotten judicial system many innocent people are in prisons. I will investigate Complaints, 7) Put some federal and state politicians, US and state judges and DA Schrunk (a mobster) in prison for official misconduct, that is a felony, for violation of the Constitution and the Code of Ethics for Government Employees,
8) Stop politicians and the big media junta to sell this country: take money off elections, 9) Improve the quality of education and discipline in schools. Teach children to respect parents, teachers and seniors. Teach children about danger of premature sex, because the taxpayers are paying for it. Prevent children obesity - give to children a jump ropes and I will do competition with them. 10) Harder punishment for crimes. Prisoners must work and pay back to society for damage, 11) Car / truck insurance. It is a "street robbery", extortion of money . If a person has no an accident, 50 % money back, 12) Stop send big money to countries where the people are saying: "Death America". Help own people. 13) Reduce income and property taxes, 14) Reduce the cost of drugs and gasoline, 15) Lock up borders to terrorists and criminals, 16) More students grants and loans must with no more than 3% interest, 17) Give a tax break to owners / landlords of Manufactured Mobile / Dwelling Homes and RV Parks for to keep them open,
18) NASA must concentrate now not on to fly on Mars and Moon, but on to fight natural disasters: to make clouds and rain to fight droughts and fires; prevent floods and hurricanes, 19) Stop the government of the USA from to make unconstitutional laws violating the freedom of citizens and businesses,
20) Stop the government of the USA to violate Amendment XIV, Section 1: steal citizens from other countries
21) Establish a child care on workplaces,
22) Everyone, not only judges. has a right for own protection keep physical address confidential,
23) Stop collection agencies to harass many innocent people, make them guilty without court order,
24) English must be official language,
25) Legalize Marijuana and others beneficial for patients drugs,
26) Ban on all lobbyists. They must have same rights as every voter,
27) Credit agencies and collection companies will have a legal responsibility for extortion of money,
28) Work with the United Nations develop one international language, 29) To make a peace on the Middle East. The approach to peace there is wrong, 30) Defend nation from a weapons of mass destruction,
31) The Oregon Public Broadcast must pay back to society for financial support and must inform and educate the public about candidates running for US Representative 1st Congressional District, but it refuses to do it. Call OPB: (503)244-9900 or 503-293- 4000

Pavel Goberman - "Unique political phenomenon", from article about me.

P.S. Democrats, in the Primary Nov. 8, 2011 Special Election, my name will not be in your Ballot. So, think, read the Voters's Pamphlet, and if you think I'm the best - write my name in Ballot. P.G.

Hines, Maurice

From: Brennen Hankins [b_hank26@yahoo.com]
Sent: Wednesday, September 28, 2011 2:23 AM
To: Columbia River Crossing
Subject: Jantzen Beach Interchange: Have your cake and eat it too

P-019-001

I read the the following article in *The Oregonian*, and I think I came up with a mutually beneficial solution: Why not stack the lanes of the bridge, ala the Queensboro Bridge in New York City, or, more locally, the Marquam bridge over the Willamette. It'd cut the width of the bridge nearly in half, yet you could still put in lanes without taken out all of the businesses or the harbor. Plus, you could put in an interchange with much more ease, thanks to the decreased width (i.e. since the freeway is stacked on top of itself, it would be possible to put in a left-side exit lane on the southbound lane, over where the previous freeway stretch runs, decreasing the need to buy up more land.)

Just something to consider.
-Brennen Hankins, Salem, OR

P-019-001

The selected alternative proposes two stacked bridges across the river, with highway lanes on the top decks and light rail transit and a pedestrian and bike path on the lower decks. Other stacking options are possible but this configuration provides substantially better access and lower impacts than putting traffic on two separate levels and putting light rail or bike/peds on the top level.

From: Walter L Johnson [mailto:seniormoment@comcast.net]
Sent: Tuesday, September 13, 2011 12:06 PM
To: Columbia River Crossing
Subject: How much of the Columbia River Crossing project could be deemed either shovel ready or brought to that stage quickly?

P-020-001

How much of the Columbia River Crossing project could be deemed either shovel ready or brought to that stage quickly? I have been shocked that so little design work has taken place for the over $100 million dollars spent so far. Indeed it didn't appear that any of the elements in the project were able to qualify for special federal funding in the previous opportunity for shovel ready projects and now more than two years later I suspect the same is true.

When I worked for the Bureau of Public Roads about four decades back, the engineers did survey work one summer, designed the highway segment (four miles on that project) over the winter with the help of a small staff and a supervising engineer, and built it the summer after the land survey using a small crew engineering aids, all but one of whom were seasonal employees, plus one laboratory technician to test concrete and soil. And, the project was completed on time and on budget.

Now more than $100 million has been spent with not even a road widening related to the project insofar as I can tell.

Walter L Johnson

P-020-001

Considerable design work has occurred to advance the project through the NEPA process. The completion of the NEPA process marks the point at which a final alternative is selected and then can be advanced into final design. See the discussion of the process in Chapter 2 of the FEIS.

From: Walter L Johnson [SeniorMoment@comcast.net]
Sent: Saturday, September 17, 2011 7:07 AM
To: Columbia River Crossing
Subject: A potential bridge aesthetic feature
Categories: Orange Category

P-020-002

A friend from Vermont sent me this link, http://www.new-england-vacations-guide.com/covered-bridges-article.html and it raised in my mind the possibility of covering the I-5 Columbia crossing bridge, or at least the pedestrian portion of it with open views, to extend the life of the bridge surface, to draw tourists just like the Golden Gate Bridge, and to add an historically relevant feature given both our timber industry, and the age of the Fort Vancouver as the site of the Hudson Bay Company, and to end arguments over what kind of feature should be added to make the bridge unique.

Walter L Johnson

P-020-002

Thank you for thinking creatively about the project. We have, in fact, looked at coverings and found them to be generally too costly for the current economic conditions. However, the project has continued to find ways for covered project elements to contribute positively to the community's aesthetics. The pedestrian and bike facility under the roadway deck will provide rain cover for users, and will have 3,000 feet of spectacular views. There is also a lid included in the project, the Community Connector, immediately south of the Evergreen bridge.

Hines, Maurice

From: Herman Kachold [hkachold@msn.com]
Sent: Friday, October 14, 2011 1:57 PM
To: Herman Kachold
Subject: Fw: Audubon Flier on the West Hayden Island Alternatives
Attachments: Save West Hayden Island November 2011.doc

From: Bob Sallinger
Sent: Thursday, October 13, 2011 3:31 PM
To: 'Jonathan Ostar' ; 'Herman Kachold'
Cc: 'Donna Murphy' ; 'Pamela Ferguson' ; 'HILP'
Subject: Audubon Flier on the West Hayden Island Alternatives

Hi All,

P-021-001

Please see attached for Audubon flier on the two West Hayden Island Alternatives.

Side One makes the case for why no marine industrial development should occur on WHI and offers our vision for a permanently protected natural area
Side Two makes recommendations on the specific alternatives being offered in the event the city does proceed forward despite opposition.

Feel free to distribute as you see fit. We are using this document at the open houses.

Best

Bob

Bob Sallinger
Conservation Director
Audubon Society of Portland
5151 NW Cornell Road
Portland, OR 97210

(503) 292-9501 ext. 110

Help Save West Hayden Island Wildlife Area! Hundreds of acres of forest, meadow and wetlands at risk of being converted to parking lots! Go to http://www.facebook.com/home.php?#!/pages/Save-West-Hayden-Island/136664296349832?ref=ts

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*** IMPORTANT: Do not open attachments from unrecognized senders ***

P-021-001

West Hayden Island is outside of the CRC project's study area.

P-021-001

We envision a fully restored 800+ Acre Wildlife Area and Nature Park at the confluence of the Willamette and Columbia Rivers: A place that provides habitat for more than 100 species including bald eagles, painted turtles, federally listed salmon and steelhead and extraordinary opportunities for people to hike, paddle and enjoy nature in an urban environment.

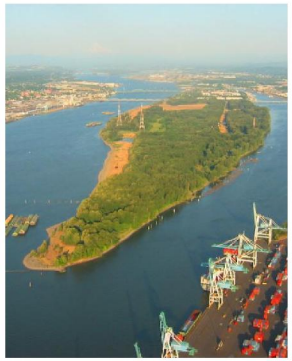
Visitors will explore a mosaic of wetlands, grasslands, beaches and one of the largest intact bottomland hardwood forests left on the Lower Columbia River. A new nature center will provide programs for children and adults about the unique role that confluence areas play in the migratory cycles of our imperiled fish and wildlife populations. Our local green economy will be supported by nature based recreation, restoration projects, and establishment of a regional mitigation bank to allow for marine development in more appropriate locations.

West Hayden Island will symbolize our commitment to restoring balance to our urban landscapes and leaving the land better than we found it for future generations

Audubon Society of Portland
Founded in 1902

Save West Hayden Island

October 2011



The City and Port continue to move forward with their efforts to pave over the West Hayden Island Wildlife Area for future marine terminals. This 826-acre natural area located at the confluence of the Willamette and Columbia Rivers represents one of the most important habitat areas in the city of Portland. The Port is currently in the process of trying to have the island annexed and rezoned so that it can build hundreds of acres of parking lots and marine industrial infrastructure---a facility for which there is no demonstrable need.

Pubic opposition to this project from conservation and community groups over the course of more than a decade has prevented the Port and the City from moving forward with annexation and rezoning. We are making progress! The Port's original demands for more than 600 acres of development have now been reduced to 300 acres and claims by the Port that it was physically impossible to build this facility at a smaller scale have repeatedly been proven false. Still this is a HUGE facility---more than 5 times the size of the Oregon Zoo-----more than 200 city blocks---that will be built in the middle of a floodplain. Even though no final decision has yet been reached on West Hayden Island, the Port is already filling the island's floodplains with tens of thousands of cubic yards of contaminated dredge materials from the Portland Harbor Superfund Site to prepare the island for development.

1) West Hayden Island is a critically important natural area:

- It contains 826-acres of intact habitat including 39 acres of wetlands, more than 100 acres of grasslands and 4% of the remaining intact cottonwood bottomland habitat between rivermile 12 and rivermile 145.
- It is home to at least 81 species of birds, 9 mammal species, 4 amphibian species (including bald eagles, western painted turtles, and provides critical habitat for federally listed salmon.
- It is designated as Class 1 riparian habitat and a "Habitat of Concern" under Metro's Title 13
- Former US Fish and Wildlife Service State Supervisor Kemper McMaster has written the West Hayden Island is considered "an important conservation asset regardless of its location. Its presence on and otherwise highly urbanized landscape accentuates its importance."

2) West Hayden Island is located almost entirely in the floodplain. In 1996, almost all of West Hayden Island was underwater. This is not the place to construct industrial facilities.

3) The Port of Portland has not justified destroying West Hayden Island to build a marine industrial facility. The Port has not sufficiently explored other opportunities such as collaboration with the Port of Vancouver to make more efficient use of the industrial land supply.

4) The new bridge (yes, another new bridge!) that would be required to support development on West Hayden Island will cost over $100 million of your tax dollars.

5) East Hayden Island is currently one of the most park deficient areas in the City: Protecting West Hayden Island as a natural area would create outstanding recreational opportunities to enjoy nature in North Portland and it would undoubtedly become one of the regions premier natural areas.

To stay up to date on efforts to permanently protect West Hayden Island, check out our Save West Hayden Island Facebook Page.

For more information contact Audubon Conservation Director, Bob sallinger at
bsallinger@audubonportland.org

P-021-001

City of Portland Open Houses

The City has produced new concept plans that will available for public review over the next two weeks. Please go to one of two open houses to comment on these concept plans. It is important to send three key messages:

1. **No development should occur on West Hayden Island---it is a critical fish and wildlife area that should be protected in its entirety**

2. **If the city does proceed forward with annexation and rezoning, we recommend the following elements be incorporated from the two draft concept plans:**

    - **Development Footprint: Audubon supports Option B. Option B results in the least fragmentation and disturbance and highest ratio of interior to edge habitat in the remaining habitat that remains. It will result in a much healthier landscape over the course of time. Option A significantly fragments much of the remaining habitat--because of this is real footprint is close to 450 acres rather than 300.**

    - **Recreation: Audubon supports a modified Option B. We believe that additional recreational opportunities could be added to option B. However it is important to leave portions of the island untrailed. We support the concept that parking, boat ramp and nature center and other amenities should be at the edge of the natural area (ideally east of the bridge rather than in the middle. Option A places parking, roads, boat ramps into the interior of the habitat areas and fragments the entire island with trails.**

    - **Bridge: Audubon is not for or against a bridge to West Hayden Island. However if a bridge is built, Option B would minimize its impacts whereas Option A would require even more fragmentation of the remaining habitat**

3. **The City must complete additional studies before making a decision. these include:**
    - **Alternative site analysis--specifically regarding more efficient use of existing industrial land base in Portland Harbor and collaboration with the Port of Vancouver**
    - **Cost/ Benefit analysis including assessing impacts on the health and livability of nearby communities**
    - **On and Offsite Mitigation Plan**

4. **Any development that does occur needs to be completely mitigated in a way that results in a net increase in ecosystem function**



West Hayden Island Grasslands

Hines, Maurice

From: Art Lewellan [lotilivo@gmail.com]
Sent: Thursday, September 29, 2011 11:08 AM
To: Columbia River Crossing
Cc: Art Lewellan
Subject: The CRC Hayden Island interchange design is unsafe, bloody unsafe...

Categories: Orange Category

P-022-001

The CRC as proposed does not create SAFER access to Hayden Island. Statistical accident rate & severity is worse. Both exits onto Hayden Island are downhill which increases stopping distance. Exiting traffic must come to a complete stop at a "T" with forced turns. Stopped traffic backs up while waiting for traffic entering the freeway to pass. Faster freeway speeds lead to faster exiting onto less visible downhill ramps with backed-up traffic and little emergency escape space. The design 'creates' a pair of extremely dangerous exits.

The Hayden Island interchange design is NOT SAFE for motorists nor pedestrians as air, water, noise, land-use & redevelopment potential, and island traffic management overall are worse than existing ramps and alternative designs.

P-022-002

The public deserves a 'fair review' of the CRC Commission's own Off-island Access Alternative Concept #1 -plus- building ONLY the Southbound bridge and using both existing bridges for northbound lanes. (Using both exiting bridges for northbound traffic improves safety.) The eventually-built northbound bridge replacement does NOT need a lower deck. Being lighter, it can be an elegant cable-stayed design to complement the utilitarian stressed-truss of the southbound bridge.

P-022-003

This phased approach to the CRC project sets up a traffic pattern that necessitates further study of northbound interchange designs in Washington State. It most likely reduces costs, but more important, achieves higher safety standards. I blame Wsdot more than ODOT for the recklessly inferior engineering. Wsdot's bored tunnel under downtown Seattle guarantees demolition of historic Pioneer Square and other downtown towers, but Wsdot only serves automobile-related business interests who profit from car-dependency. The tragedy of highway & traffic-related deaths is irrelevant to Wsdot directors and department heads.

Art Lewellan
1020 NW 9th #604
Portland 97209

P-022-001

The proposed grades and deceleration and acceleration lengths for the ramps to and from Hayden Island will meet ODOT and AASHTO standards. This will be an improvement compared to the existing interchange. The biggest improvement will be on the northbound entrance ramp where virtually no acceleration space is provided for the existing ramp. This is where the highest accident rate is recorded in the project area. The northbound and southbound exit ramps are similarly improved where the current deceleration is about 50% and 80% of standard, respectively, and the improvements will exceed the required standard. In all cases, the stopping sight distance provided will meet standard. Other improvements include the braiding of the ramps between Marine Drive and Hayden Island and the construction of the local bridge, both of which will serve to reduce the number of conflicts on the mainline and help improve the operations on the ramps.

P-022-002

The supplemental bridge alternatives evaluated in the EIS are very similar to the proposal you describe. Many different project components and alternatives were considered for the CRC project. Please see the summary of the alternatives evaluation process in Chapter 2 of the FEIS, which includes references to source documents on the alternatives screening process, and the reasons that the LPA is the selected alternative.

P-022-003

The traffic and highway engineers have designed the LPA to improve safety with full-build or with the phased option. Any future construction phasing will be analyzed to ensure safety in the roadway design.

Hines, Maurice

From: Lotilivo@gmail.com
Sent: Thursday, September 29, 2011 11:10 AM
To: Columbia River Crossing
Subject: Comment for Project Sponsors Council

Categories: PSC Comment

From: Art Lewellan
E-Mail: Lotilivo@gmail.com
Comment or Question:

P-022-004

The CRC as proposed does not create SAFER access to Hayden Island. Statistical accident rate & severity is worse. Both exits onto Hayden Island are downhill which increases stopping distance. Exiting traffic must come to a complete stop at a "T" with forced turns. Stopped traffic backs up while waiting for traffic entering the freeway to pass. Faster freeway speeds lead to faster exiting onto less visible downhill ramps with backed-up traffic and little emergency escape space. The design 'creates' a pair of extremely dangerous exits.

The Hayden Island interchange design is NOT SAFE for motorists nor pedestrians as air, water, noise, land-use & redevelopment potential, and island traffic management overall are worse than existing ramps and alternative designs.

The public deserves a 'fair review' of the CRC Commission's own Off-island Access Alternative Concept #1 -plus- building ONLY the Southbound bridge and using both existing bridges for northbound lanes. (Using both exiting bridges for northbound traffic improves safety.)

The eventually-built northbound bridge replacement does NOT need a lower deck. Being lighter, it can be an elegant cable-stayed design to complement the utilitarian stressed-truss of the southbound bridge.

This phased approach to the CRC project sets up a traffic pattern that necessitates further study of northbound interchange designs in Washington State. It most likely reduces costs, but more important, achieves higher safety standards.

I blame Wsdot more than ODOT for this recklessly inferior engineering. Wsdot's bored tunnel under downtown Seattle guarantees demolition of historic Pioneer Square and other downtown towers, but Wsdot only serves automobile-related business interests who profit from car-dependency. The tragedy of highway & traffic-related deaths is irrelevant to Wsdot directors and department heads. Blood is on their hands.

Art Lewellan
1020 NW 9th #604
Portland 97209

P-022-004

Please see the responses above.

-----Original Message-----
From: rmoewe@aol.com [mailto:rmoewe@aol.com]
Sent: Tuesday, October 04, 2011 7:44 AM
To: Columbia River Crossing
Subject: Comment from CRC Submit Comments Page

From: richard moewe
E-Mail: rmoewe@aol.com
Comment or Question:

P-023-001 Who/how do I reach. I am semi retired from 30 yrs in transit construction management, looking to downsize and live in WA. Join WDOT or ODOT for this specific project. Please point me in the right direction

P-023-001

Please visit the ODOT and WSDOT websites for more information about job openings and contracting opportunities.

P-024-001

Columbia River
CROSSING **Comment Form**

Thank you for taking the time to give us your thoughts and help shape the future of this project.

DATE: 11 OCT 2011

COMMENTS:
I'd like to receive a copy of the 2 profile views of the corridor.

Thanks!

mmolstead@yahoo.com

also a link to PBAC page

PLACE COMPLETED FORM IN BOX OR TO A STAFF MEMBER.
so may be mailed:

River Crossing
ington St., Suite 300
r WA 98660

@columbiarivercrossing.org

2726 or 503-256-2726

mbiaRiverCrossing.org

ADA and Title VI Notice: The meeting site is accessible to persons with disabilities. Accommodations for people with disabilities or in need of language translation can be arranged with advance notice by calling CRC at 866-396-2726 or through the Telecommunications Relay Service at 7-1-1.

CRC ensures full compliance with Title VI of the Civil Rights Act of 1964 by prohibiting discrimination against any person on the basis of race, color, national origin or sex in the provision of benefits and services resulting from its federally assisted programs and activities. For questions regarding Title VI Programs, you may contact 360-705-7098 or 503-986-4350.

Washington State Department of Transportation | Oregon Department of Transportation

P-024-001

The profile was sent to you on the 21st of October. If you would like any additional information, please contact the project office.

From: fredtrain@aol.com [mailto:fredtrain@aol.com]
Sent: Saturday, September 17, 2011 8:26 PM
To: Columbia River Crossing
Subject: Re: CRC's Final Environmental Impact Study

P-025-001 Excuse me. The FEIS isn't only supposed to be another propaganda piece. It's supposed to answer all the comments received on the DEIS. You got a lot of substantive comments about the faulty assumptions, analysis and conclusions in the DEIS and documents leading up to it. Some comments were quite extensive in their scrutiny and suggestions of alternatives.

Fred Nussbaum
6510 SW Barnes Road
Portland, OR 97225
503.292.5549

-----Original Message-----
From: Columbia River Crossing Project <feedback@columbiarivercrossing.org>
To: FredTrain <FredTrain@aol.com>
Sent: Thu, Sep 15, 2011 9:17 pm
Subject: CRC's Final Environmental Impact Study

You're Invited

to learn about plans to address safety and traffic problems on I-5.

Publication of the Columbia River Crossing (CRC) Final Environmental Impact Statement (EIS) brings the project closer to completing the planning phase. The Final EIS contains analyses of the project's potential environmental and community effects. It also describes how a replacement Interstate Bridge, light rail and other project elements will improve safety and relieve congestion.

Drop-In Information Sessions
Wednesday, October 12, 2011
2 – 4 p.m. and **6 – 8 p.m.**
Vancouver Community Library
901 C Street, Vancouver, WA 98660

Thursday, October 13, 2011
2 – 4 p.m. and **6 – 8 p.m.**
Jantzen Beach SuperCenter Community Room
1405 Jantzen Beach Center, Portland, OR 97217

PLAN YOUR TRIP: www.trimet.org or www.c-tran.com

For more information about the FEIS drop-in information sessions please visit our website.

Direct questions or comments tofeedback@columbiarivercrossing.org

P-025-001

The level of detail in the DEIS was intended to inform the public and other stakeholders with relevant information in order to understand the impacts and trade-offs associated with various alternatives. While some readers felt that the DEIS did not have enough detail, others felt that it was too long and detailed.

Public open houses and numerous public meetings were held to provide opportunities for public participation. Additionally, the project team attempted to respond to questions about the location of certain information in the DEIS during the DEIS comment period. Comments on the DEIS have been considered, and were further discussed and assessed at numerous meetings following the selection of the LPA. There are many ways in which the comments on the DEIS have influenced the project's design. The changes to the project which were initiated by citizen input are discussed in Chapter 6 (Public Input on the Draft EIS) of the FEIS.

Hines, Maurice

From: fredtrain@aol.com
Sent: Friday, October 14, 2011 1:18 AM
To: Columbia River Crossing
Subject: URGENT: Can't find FEIS Comment period information when searching your site

P-026-001

I have been searching your web site in vain for information on the FEIS and the comment period for the FEIS. All I get is a listing of **D**EIS topics. Not only is this frustrating, but you may be violating federal public input rules. It is my understanding that the end of the Comment Period is near. I need to know when that is and I need to know it immediately.

Thank you,
Fred Nussbaum
6510 SW Barnes Road
Portland, OR 97225
503.292.5549

P-026-001

The FEIS and details on the review period were available on the project website during the entire review period. Upon reciept of his email, project staff contacted Mr. Nussbaum by phone to direct him to the requested information on the website. It is important to note that, when adding them to the website, care was taken to ensure that links related to the FEIS were easy to find.

Terry Parker for Metro

to make a difference

P.O. Box 13503, Portland, Oregon 97213 - 0503 Phone: 503 284-8742
parkert2012@gmail.com

Subject: Comments to the Columbia River Crossing October 12, 2011

P-027-001

While I can support the decision already made to construct a new I-5 Columbia River Crossing between Portland and Vancouver: I do however believe there is a less expensive option that "should" have been fully explored. Such an option would have included a new, safer I-5 bridge for through traffic coupled with an earthquake retrofit and repurposing the existing historical bridges for local traffic, transit alternatives, bicycles and pedestrians. With a Locally Preferred Alternative already chosen, I view a lower cost option of this type as a fallback plan B if the dollars for the LPA don't materialize. Since LPA will remove the existing bridges at a cost of well over a million dollars; at the very least, the existing bridge spans – currently in good shape - should be saved and reused someplace where a bridge or bridge replacement is needed.

What I can NOT support is the current CRC funding plan. All the dollars for the entire project - including nearly $900 million for light rail - directly or indirectly are coming from highway user paid taxes and fees. New Starts funds, for example, are siphoned off from the Federal Highway Trust fund that is supported by the federal taxes on motor fuels. The additional projected $400 million in federal dollars that could possibly come from a Highway Projects of National and Regional Significance program are likewise from the Federal Highway Trust Fund. The latter dollars however appear to cover little more than the potential projected cost of the bicycle infrastructure. The $450 million each the states of Oregon and Washington are expected to kick in will also come from taxes on motor fuels and other highway user paid fees. That leaves nearly $1.3 billion to be extracted through another mechanism which is tolling.

I-5 is the primary West Coast interstate commerce corridor between Canada and Mexico. Where are the federal dollars for the highway component of the CRC? Being the principal stakeholders, where is the representation or even a CRC working advisory group for the motorists? Commuters driving from the Washington side of the river have been contributing $150 million each year into the Oregon treasury, plus much more into the Oregon economy. That could even increase with expansion of the Silicon Forest in Washington County. The CRC is a multi-mode project with three basic legs; highway, light rail and bike/ped. Yet 100% of the existing funding scheme to pay for the entire project is coming from only one leg. Tolling only the highway users, especially hammering the working class commute time highway users with congestion priced tolling, amounts to a prejudiced redistribution of wealth. The "big hole" in the bridge plan is the lack equity and fairness. Charging the highway users high and excessive tolls will only have a negative impact on jobs and the local economy, especially for small businesses and small service companies that have accounts on both sides of the river. Since the benefits of a new crossing will be shared, then so must the sacrifices.

A cultural shift needs to take place that equitably balances the user fees by justly distributing the costs for a new CRC to the users of all vehicle modes including tolls for bicycles and a surcharge on transit fares while minimizing the highway tolls. Additionally, broadening the funding base is a step in the right direction for alternative transport infrastructure to become more financially self-sustainable while also providing a steady revenue stream less impacted and interrupted by oil prices, commuting tends or traffic projections. The reality check is that some tolling must occur for this project to be built. Taxpayer equity requires that all bridge users contribute and pay a proportional share of this needed economic generator and transportation project.

Respectfully submitted,

Terry Parker

P-027-001

Many different options for addressing the project's Purpose and Need were evaluated in a screening process prior to the development and evaluation of the alternatives in the DEIS. Options eliminated through the screening process included a new corridor crossing over the Columbia River (in addition to I-5 and I-205), an arterial crossing between Hayden Island and downtown Vancouver, a tunnel under the Columbia River, and various modes of transit other than light rail and bus rapid transit. Section 2.5 of the DEIS explains why a third corridor, arterial crossing of the Columbia River, and several transit modes evaluated in screening were dropped from further consideration because they did not meet the Purpose and Need. For a general description of the screening process see Chapter 2 (Section 2.7) of the FEIS. It should be noted that every proposal received from the public was considered, and many of the proposals that were dropped from further consideration included elements that helped shape the alternatives in the DEIS. The issue of adverse impacts to businesses, resulting from tolling, was addressed as part of the economics analysis and is described in detail in the Economics Technical Report. This report, and Chapter 3 (Section 3.4) of the DEIS, note that the increased costs incurred because of tolls would generally be offset by the improved travel options and travel times. Under existing and No-Build Alternative conditions, congestion delays and high crash rates have significant costs for local businesses and travelers; improving these conditions is one of the purposes of the project. Tolls could discourage home-based shopping trips from Clark County to points in northern Oregon, such as Hayden Island and Airport Way. However, the variable-rate toll structure that was evaluated in the DEIS allows for different rates to be charged by time of day. Therefore, discretionary trips, such as those between Oregon and Washington for retail purposes, could be taken in off-peak hours when toll rates are at their lowest, reducing the effect of the tolls on these types of trips. Also, CRC would provide improved transit connections between Clark County and Oregon, offering travelers a toll-free alternative for reaching

destinations across the river. Details of the tolling system are still being refined as the project development enters the final design stage. It is currently not anticipated that transit users, bicyclists, or pedestrians will pay a toll. Additionally, certain toll discounts or waivers for other groups have been and will continue to be considered. The ultimate decision on any tolling options will be made by both the Washington and Oregon Transportation Commissions.

From: King, James
Sent: Monday, September 19, 2011 11:27 AM
To: Francis, Carley; Hines, Maurice
Cc: document.control
Subject: Second D. Peterson Call - total project cost of acquisitions numbers

Good morning,

Debbie Peterson called me directly this morning at 11:09 am. I spoke with her for two minutes. She iterated her request from her earlier voicemail – which I've since forwarded to you both earlier this morning.

P-028-001

Ms. Peterson is asking for, "total project cost of acquisitions numbers, for both highway and transit, broken down by parks, business and homes."

She indicated that she was certain this information was in the newly released FEIS but she could not find it. Ms Peterson said she would hold for the answers, as she was sure we were asked for this data all the time and that she was sure that I would have the data handy for her. I indicated to Ms.Peterson that, "the leg work to get her those numbers would take some time to complete."

JK

P-028-001

Ms. Peterson received a response to her request on October 7, 2011.

From: "Kevin Peterson" <petersondesign@centurytel.net>
To: "Lenzi, Jerry" <LenziJC@wsdot.wa.gov>
Cc: "Boyd, Nancy" <boydn@columbiarivercrossing.com>
Subject: cemetery
Hi Jerry,

P-029-001

The attached paper is what my understanding of the cemetery issue is.

Also attached is a paper put together on potential benefits to Fort Vancouver for the straight alignment.

Both are good reads and communicate my basis for suggesting that the claim a cemetery exists or burials where the C-D straight alignment is placed is likely less of a cultural resource disturbance than the proposed downstream alignment.

As always, please do point out where I might be wrong. I have no intention of misrepresenting the truth as this is, in my opinion, an unprofessional thing to do.

Best regards,

Kevin

P-029-001

Project staff have reviewed the paper Mr. Peterson provided that suggests an upstream replacement I-5 bridge with a straight alignment would result in fewer disturbances to cultural resources. The decision to build a replacement bridge downstream of the existing bridge is one that has been vetted and analyzed carefully, subsequent to a rigorous technical and public process. Since 2005, CRC has involved the Fort Vancouver Historic Trust, the National Park Service, the City of Vancouver, more than a dozen tribal governments, and other state and federal agencies in the development and review of technical information. The general public and multiple stakeholder groups have also been engaged as part of a robust public process which boasts over 950 public events and meetings to date.

Staff have discussed Mr. Peterson's ideas with him on multiple occasions in 2010 and 2011. He also had the opportunity to present to the CRC Bridge Review Panel at the end of 2010. Many of the ideas that he brought forth had been previously considered during the past six year planning process for the CRC project. New ideas were also evaluated by project staff and the Bridge Review Panel after meeting with him. An upstream alignment was considered but rejected during the alternatives development process because of the reasons described in the DEIS and FEIS, and these reasons remain valid.

Cemetery Concerns
Is a cemetery located near the River?

Contents

Abstract
Background
Cemetery Locations
Informal Burials near Historic Cemeteries
River Edge Burials and Human Remains
Includes four figures
Conclusions
Appendix 1
Opinion Piece Published in The Columbian
Appendix 2
Excerpt from CRC EIS Section 4(f)

P-029-001

Abstract:
The CRC project office argues that human burials might be located in the vicinity of the historic village that adjoined the Hudson Bay stockade. The project office is concerned that disturbing human remains, especially those of Native Americans, is a serious concern influencing alignment choices. The project office claims that any I-5 alignment to the east of I-5 located near the river, as would be the case with the straight aligned collector/distributor option, presents a more likely probability of disturbing burials than would occur if I-5 is relocated downstream - even if the downstream alignment disturbs a half million additional square feet of land area than would the C-D straight alignment.

This paper explores this alignment concern. Information presented in this paper is based on fragmented information available to the author. As the author is not an archeologist, historian or has any unique education or skill regarding preliterate burial customs this paper is only intended to bring forth what facts are available and postulate on these facts. Care must be taken to avoid acceptance of arguments made for, or against, any alignment without careful vetting of information that is not available to the author. However, this paper deals with this issue as project office materials have not been made available to the author.

The conclusion reached relative to potential human remains is that human remains may be present but may not be burials and may be downstream of the historic village adjoining Fort Vancouver. Only one human remain has been found in this area and these scattered remains are inconsistent with a burial further suggesting a pre-contact burial ground does not exist. Burials during the historic period in all likelihood were not done within the context of household structures or building of the settlement village or adjoining agricultural lands suggesting that any remains are likely to be random and deposited at the

P-029-001 time of first contact or earlier. Understanding of pre-contact Native American land use in this area is uncertain although projectile points and other artifacts have been found throughout the area.

The single human remains near the historic village suggest that the larger the footprint of I-5 the more likely the project will encounter Native American remains. Locational distinctions within this area, that area between the shore line and 7th Street and within a quarter mile downstream of Fort Vancouver and the village, are less likely to be a determinant as the single human remain was not consistent with a burial grounds or cemetery.

Background

Native American populations were decimated by illness and disease when first exposed to Europeans. This tragic first contact period was one of shocking displacement due to the introduction of European land use and land control philosophies that caused a double hit to Native Americans – a terrible period of lost life, lost land and altered culture. Today we are more aware of the damage caused by enculturation and seek to respect the Native American population by honoring places where and when we encounter remains and remnants of these proud groups. For the Columbia River Crossing this is a heightened sensitivity to this past and a desire to cause as little negative impact as possible and honor and respect any disturbance that the project might cause.

We know the history of the area from the early ninetieth century when the Hudson Bay Company first located an outpost at the site. Before this period we have only archeological records and oral history to understand the pre-contact period.

This paper is void of detailed investigation of artifacts found at the site from this pre-contact period. Also, oral history that has survived is also not included in this paper. What is included is only the result of discussions with knowledgeable people and research of modern media.

The author fully admits to a bias on this subject. Native Americans were exploited by the European culture, which includes the culture of a young United States, and were not treated or honored in a way respectful to the First Peoples or consistent with Christian beliefs. If anything comes from this paper it is my hope that the presence of Native Americans can once again be felt at the site and future generations are given knowledge of pre-history, first contact and the need to share lands we commonly occupy and honor all those who make up the human condition and spirit.

Cemetery Locations

With the HBC came the first known cemetery. Located away from the river beyond the mission this cemetery is not in the area of the river and is not near to where the C-D Straight Alignment will be. With the US Military presence a second cemetery was created in which relocated remains in the first cemetery were moved to create one common cemetery. The second cemetery is further from the river than the HBC cemetery but closer to the 'cut' that is the 1950's I-5 construction. This second cemetery was itself relocated to a site even further from the river. Both cemeteries are not an issue for I-5 as

P-029-001

alignment choices for the freeway, the CRC curved downstream alignment of the C-D straight alignment, are essentially the same with respect to historic cemeteries.

Informal burials near Historic Cemeteries

In the 1950's when the I-5 'cut' was dug between Fort Vancouver and the city a number of burials, approximately a half dozen, were disturbed and relocated. My understanding is that these burials took place in the historic period. This suggests that to the north and west of both historic cemeteries were places where informal burials took place. Not to have included these burials within either formal cemetery might have occurred for a number of reasons that we are only to speculate about. Possibly the religious nature of the cemeteries precluded use by other religious peoples, the formality of a military fort limited burials to known people within the settlement population, deaths of those not part of the settlement might have been segregated from the formal cemeteries, racists attitudes brought about segregation, etc. The fact that burials were located to the north and west of both cemeteries is cause to anticipate the discovery of more remains if the 'cut' between Fort Vancouver and the city is increased – widened and/or lengthened.

Both proposed I-5 alignments have comparable, if not identical, impacts in this 'cut'. Both bridge alignments merge to share a common footprint at about Sixth Street so the impact on these informal burial sites is cause for the same care and consideration. The focus of concern is between the 'cut' and Columbia River and along the shoreline downstream of Fort Vancouver.

River Edge Burials and Human Remains

During construction of the pedestrian bridge one set of human remains were disturbed. These remains were scattered and shallow, dating to the period of first contact or before first contact. Archeological excavation suggests that these remains were not a burial consistent with other post-contact burials. These remains may have been an informal burial or may not have been a burial. If this person's body was not buried then the remains are that of an unfortunate death in which the remains were not attended to.

To assume that a cemetery is present in this area is incorrect. However, reconstructing the settlement and identifying sites where human remains are found is valuable. Certain assumptions can be made with respect to land use and the possibility of burials. For example, during historic times people were not buried within the town or village outside cemeteries. People were also not buried in agricultural lands. This suggests that the likelihood of informal burials is not likely within the village or agricultural areas.

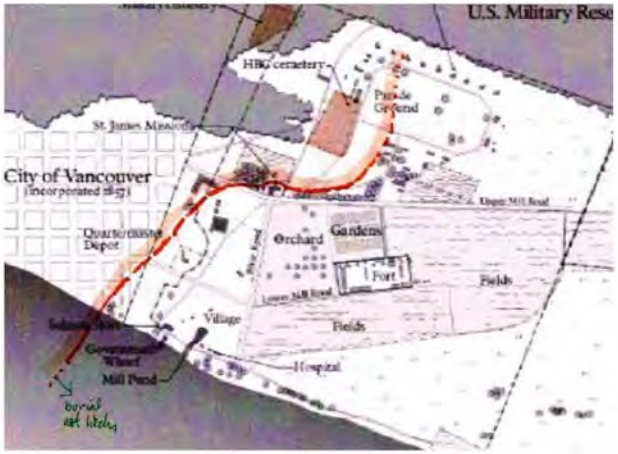


P-029-001

Figure 1

HBC plan of Fort Vancouver

Burials in 'The Village', agricultural areas or the 'Fort' are unlikely. North of Saint James Mission is the cemetery. The orange line is indicative of where informal burials might be found – to the Northwest of the village, mission and fort. Note that the dashed line bisecting the village is the approximate eastern edge of I-5.



P-029-001

Figure 2

Early US Military and City of Vancouver period

During this period the second cemetery was built just north and west of the HBC cemetery. Informal burials would be most likely found to the north and west of the City of Vancouver in the vicinity of the two cemeteries. Little likelihood exists of burials to the east and south of the orange line.

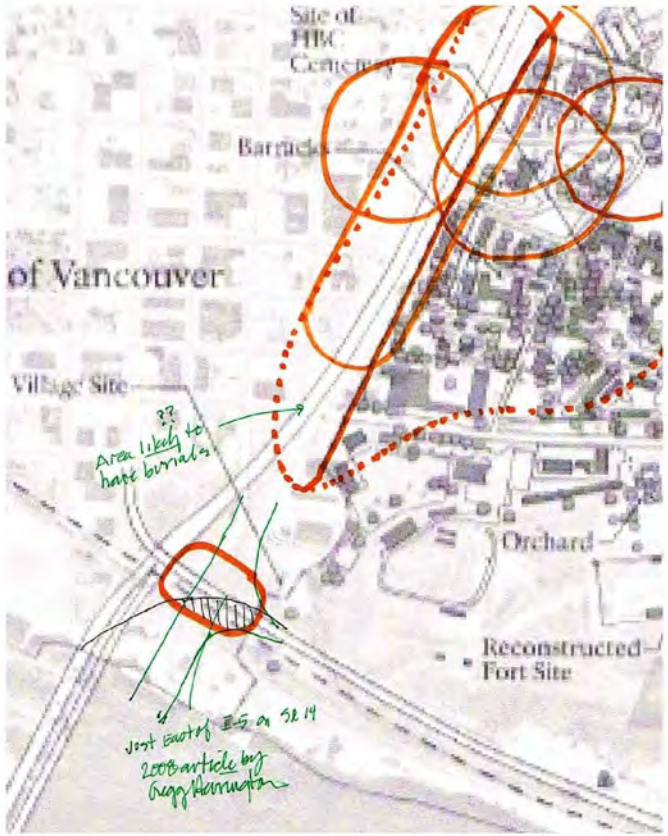


P-029-001

Figure 3

Early twentieth century map of Fort Vancouver.

In this map we see that the HBC cemetery has been replaced with military housing. Also of interest is the large parcel located just west of the military cemetery. Could this land have been envisioned to be a cemetery, park of buffer between the city and cemetery? Or might the presence of informal burials during the previous century have been a reason not to plat this land with typical city blocks?



P-029-001

Figure 4

Possible locations for informal burials?

This map brings together speculation on burial sites contained in the local newspaper article written on this subject a few years ago. This article is contained in appendix 1.

P-029-001

Conclusions

The two cemeteries at Fort Vancouver were located to the northwest of the stockade and the riverside village. Both cemeteries likely had informal burials outside the formal burial grounds in non-inhabited non-agricultural areas northwest of the cemeteries as witnessed by burial sites found when relocating I-5 to the trench between the fort and city. No 'burials' have been found southeast of the cemeteries in the vicinity of the village or stockade. However, one human remain was found in the vicinity of the SR-14 interchange. This remains date to the period of first contact or pre-contact and are inconsistent with burial due to the scattered nature of the remains. It is highly unlikely that the remains of this individual constitutes a 'cemetery' and is more likely a single event. This set of human remains might be typical to any location along the waterfront in the area of Vancouver or Fort Vancouver where trails and paths that existed before first contact or during the pre-settlement period of first contact are located.

Disturbing Native American remains throughout the area is a concern. This is because the area was a place where trails reached inland from the river and was a place where Native Americans likely gathered. Although no pre-contact Native American burial grounds have been found in the I-5 area the possibility of uncovering human remains should be anticipated regardless of alignment selected and is an issue likely more dependent on the extent of land disturbed than is the distinction between upstream and downstream of the existing I-5 bridge. It follows that minimizing potential disturbances is to minimize the footprint of the project.

The comparative land needs for I-5 alignment choices are therefore the land area needed north of the Columbia River and south of 6th Street. The proposed CRC downstream alignment results in a total of 1,525,000 square feet of disturbance compared with 852,000 square feet of disturbance for the C-D straight alignment, the possibility of disturbing pre-contact Native American remains is therefore much more likely with the currently proposed downstream alignment as this option disturbs approximately 673,000 square feet more than the C-D straight alignment.

However, both alignments share the need to widen the cut between Fort Vancouver and the city. This is the area where burials can be expected and the project is taking appropriate actions to mitigate disturbance. The project appears to be taking actions that exceed minimal requirements and should be complimented for this.

P-029-001

Appendix 1
Opinion piece published in The Columbian

Opinion - Ancestral hand guides bridge siting
by GREGG HERRINGTON Columbian staff writer

One of the reasons a new bridge across the Columbia River is likely to be built downstream of the present twin spans, rather than upstream, can be found in a two-story building inside the walls of the reconstructed Fort Vancouver, about a quarter mile from Interstate 5.

There, on the second floor of the climate-controlled archival storage facility, out of public view, is a tan, six-and-a-half-foot- tall, metal cabinet.

That's where they keep the bones.

Skeletal remains of nine Native Americans were unearthed between 1953 and 1955 when they were digging The Big Ditch through Vancouver. On March 31, 1955, the four-lane freeway was opened, replacing Highway 99 via Main and Washington streets as the primary north-south route through town. (More lanes were added in the late 1960s.)

By putting a new bridge on the downstream side of the two existing spans, there's less chance of digging up Indian bones. And Don Wagner does not want to dig up more Indian bones.

More than nine grave sites

Wagner, administrator of the state Department of Transportation for Southwest Washington, knows well what the experts say: There are more Native Americans and others interred near I-5 between Officers Row on East Evergreen Boulevard and state Highway 14, especially just east of I-5.
Who knows? There could be remains under the traffic circle at Evergreen Boulevard and Fort Vancouver Way and under Vancouver Police Department headquarters just south of there. Maybe there are bones a few inches below the basement floor of the old Kiggins House at Evergreen and West Reserve Street.
"You know there are grave sites beyond those nine," Wagner said. "So you know there are some issues there."

The land under and along the I-5 swath through downtown Vancouver "is a site with hundreds and hundreds of years worth of history on Native Americans and Europeans," he said. "We know the site is rich in cultural and spiritual values."

Wagner's interest isn't just historical. It's mostly about the future.

P-029-001

"I need to do a project there," he said. "We've got to bring this cultural conversation to the forefront and talk about the history of the site and discuss how we move forward knowing that people died and were buried in the footprint of the current transportation system."

"The cultural sensitivity of the property will be an influencing factor in where the bridge goes," Wagner added.

"The tribes might say it's OK so long as we don't disrupt bones. First, you've gotta find out what's there. Then you have to have the conversation about what's best to do."

The state has notified 29 Indian tribes about the quandary ahead. Of course, it won't be a quandary at all unless there's money for a new bridge. Based on what Sen. Patty Murray said in Vancouver on Wednesday, Congress won't be sprinting to write checks for this would-be project.

The bridge -- and the bones

Many of the old Vancouver Barracks bones are well-traveled. I talked this week with Doug Wilson, archaeologist for the Vancouver National Historic Reserve. Based on that interview and on a 2003 column by Columbian Editor Emeritus Tom Koenninger, here's where bones might be buried -- bones Wagner the bridge-builder doesn't want to find.

From 1839 to 1856, Europeans, Hawaiians and native Americans were buried in a Hudson's Bay Company cemetery south of the Officers Row parade grounds and north of East Fifth Street.

In about 1866, many of the remains were moved to a new Army post cemetery at what today is the west end of Officers Row, between I-5 and the traffic circle on Fort Vancouver Way.

In 1883, they were moved again, to any of three cemeteries still in existence, two on Fourth Plain Boulevard just east of I-5 and the Old City Cemetery at East Mill Plain and Grand boulevards.

The trouble is, says Wilson, "We don't think they got them all. We know that not all of the human remains were in the old cemeteries." And, as Koenninger wrote in 2003 about the Hudson's Bay Company graveyard, part of it "lies under asphalt and concrete streets, parking areas and ancient Army buildings."

Wagner, the highway builder, would really rather let them lie.

Gregg Herrington's column of personal opinion appears on the Other Opinions page each Friday.

Note by the paper author, Kevin Peterson:

Gregg wrote this article at a time when the project office was considering a freeway layout that pushed the replacement freeway deep into Fort Vancouver Park so that a single wide freeway deck, using twin bridges, plus a separate LRT bridge were placed upstream of the existing I-5 freeway. Also, the project was anticipating that a cloverleaf type freeway interchange with SR-14 was required. Readers should

P-029-001 *know that this solution is not the C-D straight alignment and would have been similar to the CRC project office downstream alignment without the 'S' turn. Don Wagner is correct stating concern that additional land take east of I-5 in the vicinity of the historic cemeteries is a worry. However, the C-D straight alignment is most definitely not a similar freeway philosophy! To construe that the C-D straight alignment is the same is intentionally misleading and not a truthful statement.*

P-029-001

Appendix 2
Except form CRC EIS Section 4(f)

SECTION 4(f) EVALUATION **5-15**
Archaeological Resources
Several archaeological sites, or archaeological contributing elements to the VNHR Historic District, are located in the archaeological Area of Potential Effect (APE). Several sites were likely impacted by previous construction of I-5 and SR 14. The archaeological APE also includes locations where a historic "military cemetery" may have been located.
While graves were exhumed and re-interred at another cemetery during the late 1800s, previous archaeological research has indicated that not all of the graves were relocated. Unmarked graves were apparently excavated during construction of I-5, and other potential grave shafts have been identified in the general vicinity of the historic cemetery. The exact location of the cemetery is withheld from this report because of the sensitive nature of the resource. The portion of the CRC project that overlaps the historic site of the cemetery, based on historic mapping, has been extensively altered by past excavations and construction.

- From chapter 5 of the DEIS

P-029-001

What's best for Fort Vancouver?

Three years ago the CRC project office put forward a specific idea – and alignment and layout – for replacing the I-5 bridges. This idea allows for a potential park like pedestrian lid over the freeway in the cut between upper areas of Fort Vancouver and the northern edge of the Vancouver CBD. In the vicinity of the river and lower downtown Vancouver, where the fort and city have a much longer history, this layout slightly worsens the impact of I-5 on Fort Vancouver; the freeway takes a bit more land out of the park and continues to be a barrier between the park and city. Near the stockade and historic village the proposed layout and alignment offer Fort Vancouver no betterment – just a slightly worse condition.

How might the proposed I-5 project benefit the park? I do not believe the park was consulted in regards to possible advantages the project might bring to the National Heritage Site or this information would be found within the CRC project office web site. I can be entirely wrong here but one must remember that the CRC project office uses only six problems as measures guiding design decisions for the project. It's best to list these as they provide insight to the attitude and actions of the project office - insight that leads one to realize that the project is not considering betterment as a basis for placing the freeway or the design of structures.

The SIX PROBLEMS:

1. **Growing travel demand and congestion**: Heavy congestion has resulted from growth in regional population, employment, and interstate commerce. The existing I-5 crossing provides three lanes for northbound and southbound travel, which can accommodate approximately 5,500 vehicles per hour in each direction. However, there are more people who want to use the crossing during peak periods than can be accommodated on the bridges, which results in stop-and-go traffic the mornings and afternoons. Cars getting on the highway have little room to accelerate and merge with highway traffic (short merging lanes) and have no room to pull off the highway (narrow shoulders) when an accident occurs or when vehicles break down. These conditions make congestion worse and decrease safety. Traffic can also become congested when large river vessels must use the lift spans to navigate underneath the I-5 bridges.
2. **Impaired freight movement**: Congestion on I-5 reduces freight mobility between regional markets in Portland and Vancouver, as well as national (California and other neighboring states) and international (Mexico or Canada) destinations along the I-5 corridor. Freight trucks most often travel in the middle of the day to avoid congestion. As hours of congestion continue to increase over time, travel times for freight trucks will continue to increase—even when traveling during the off-peak hours. This increases delivery times and raises shipping costs. It also negatively affects this region's economy. Truck-hauled freight in the Portland-Vancouver region is expected to grow more rapidly than other forms of freight movement (such as marine-hauled freight). Truck-hauled freight is forecast to grow from 67 percent of total freight movement in 2000 to 75 percent in 2035.
3. **Limited public transportation operation, connectivity, and reliability**: Congestion on I-5 reduces bus travel speeds and reliability. Local bus services currently travel between downtown Vancouver and downtown Portland. Express bus routes serve commuters by providing service directly from Clark County park and rides to downtown Portland. Both of these services travel over the I-5 bridges. Bus travel times from downtown Vancouver to Hayden Island increased 50 percent between 1998 and 2005. On average, local bus travel times are 10 to 60 percent longer during peak periods than during off-peak periods.

P-029-001

4. **Safety and vulnerability to incidents**: Over 300 crashes are reported annually on I-5 in the project area, making this one of the most accident-intensive section of I-5. This high accident rate is a result of multiple highway design features that do not meet current standards, including:

   - Close interchange spacing – within the CRC project area, I-5 has six interchanges spaced approximately one-half mile apart. The recommended minimum distance between interchanges is one mile so that cars entering and exiting the highway have enough distance to fully merge with traffic or diverge to the off-ramp before the next interchange.
   - Short on- and off-ramps – several on-ramps are not long enough for vehicles to reach highway speed before merging with highway traffic. Off-ramps are too short for safely slowing down, and may cause back ups from exits that block traffic on I-5. This generates traffic congestion and can cause accidents because maneuvering is difficult, especially for large trucks.
   - Vertical grade changes – a "hump" in the I-5 bridges that accommodates the Columbia River shipping channel blocks the view of roadway conditions ahead. This blocked view reduces speeds and creates potential hazards to motorists.
   - Narrow lanes and shoulders – several portions of I-5 in the project area have narrow inside and outside shoulders, while the I-5 bridges essentially have no shoulders, with less than one foot between the outside lanes and the barrier. The northbound I-5 bridge also has lanes one foot narrower than the minimum standard for a highway, and no shoulders. These conditions place vehicles very close to physical barriers and other vehicles, causing motorists to slow down, and do not provide space for broken down vehicles or emergency vehicles.
   - Hazardous river navigation – the Coast Guard has agreed not to raise the I-5 bridges' lift spans during peak traffic periods because of the substantial impact this would have on automotive traffic. This requires boats heading downstream (west) to navigate using the fixed "barge channel" near the middle of the river, and then quickly turn to line up with the narrow opening on the north end of the Burlington Northern Santa Fe (BNSF) railroad bridge, located about one mile downstream. This movement is especially difficult during high river levels.

5. **Substandard bicycle and pedestrian facilities**: The bicycle and pedestrian paths on the I-5 bridges are very narrow (four feet wide in most places) and extremely close to traffic and to the steel trusses. Also, the connections to these paths at both ends of the bridges are difficult to follow, especially around the Marine Drive and Hayden Island interchanges. Many existing non-motorized facilities cannot be used by persons with disabilities, and thus do not comply with the Americans with Disabilities Act standards.
6. **Seismic vulnerability**: The I-5 crossing is comprised of two bridges, one built in 1917 (the northbound structure) and the other built in 1958 (the southbound structure). The foundations of both bridges rest in soils that could liquefy during a major earthquake. Neither bridge was built to current earthquake safety standards.

What's missing? The urban and natural context for the freeway! No value is given to neighbors, urban uses and the sense of place that is Fort Vancouver.

Where are contextual issues? Where are integration goals? How will the freeway layout work with adjoining land uses to strengthen the viability of the urban area? Where is sensitivity to the cultural resources, including the park, that are so very important to the area? These concerns are not measurable attributes that the project has formalized to guide the critical decisions they are making.

P-029-001 These are positive outcomes of a planning and design process that embraces more than just 'six problems'.

If the project office does not provide insight then where is guidance to be found? Without this insight it is prudent to speculate on the park context and possible advantages the project might offer.

What measures are important to Fort Vancouver?

Access. The more people that are able to access the park the better the cultural resource is to the people of the region. The project should look to ways that encourage accessibility to the park, especially with a light rail line offering Portland metropolitan visitors potential access. An obvious example of improving access is locating and designing the LRT station as an entry to the park, lower Vancouver and the proposed waterfront development. Another example is a strong pedestrian connection between the historic park – the stockade and village - and the waterfront. Reinstating the historic linkage between the Vancouver city street grid and Fort Vancouver park also does this.

Historic Context. How can the freeway be configured so that a sense of historic context is achieved? This is a tricky question in that the fort itself is a history of change – from a Hudson Bay outpost to a spruce mill producing wood products used in WWI aircraft. However, the romantic and historically important period of the park might best be 1830 to 1880 when the fort and village were the focus of early settlement in the Pacific Northwest. This is a period in which Native American culture was replaced by western European influence and a young United States. The question posed to project engineers and architects is how might structures, which will occupy the western edge of this historic setting, help recall this period of time? How can the project help present the historic and important symbiotic context of fort, village and young city?

Land Take and Land Availability. Freeway layout and its design best serve the park if land is not unnecessarily taken. However, even more importance is the question of making land available to better facilitate and achieve park needs and functions. This is a proactive position that a project can take if civic leaders decide that an infrastructure improvement solves technical problems and betters the needs of neighbors. This is almost 180 degrees different from the CRC project office attitude that they need only solve six technical problems when planning and designing the freeway and bridge. How might Fort Vancouver benefit from more land? By connecting the fort with the river edge village and the lower Vancouver city street grid – the built environment that was the context between 1830 and 1920 – that's how.

To bring this sensitivity into the project in a coherent and thoughtful manner is only achieved by the action of talented, experienced architects and engineers acting under the leadership of civic minded visionaries who are willing to demand that the project is responsive to more than just solving six technical problems. Historic attributes can be the basis for responsive design if they are considered important to project leaders and are carefully and thoughtfully integrated into the design process. Unfortunately, this attitude seems lacking in the project office and is not considered an essential project

P-029-001

goal by state transportation leaders in Oregon or Washington. The burden falls on local and national leaders who may not have known this project has more than just one option or have not demanded context sensitive accountability from the project office. Qualitative influences seem only to exist as a mitigation tool within the CRC project office used to overcome negative feedback. For example, the idea of a pedestrian lid was a mitigation reacting to concerns put forward by the City Vancouver and the park.

The CRC project office did assemble an Urban Design Advisory Group, called the UDAG, which tried to inject some sensitivity into the actions of the project office. The value of this input to the project office is reflected in this group being disbanded. However, soon after this group was terminated by the project office, when they were no longer advising the project, they did send a letter to the two state governors recommending goals for the project. These are:

1. **Create suitable gateways to the States of Oregon and Washington**
2. **Knit together rather than divide neighborhoods along the way**
3. **Acknowledge and plan for wise use of the waterfront areas throughout the project**
4. **Help make the Columbia an important focus of the region rather than an obstacle to be overcome**
5. **Achieve a Columbia Bridge structure that is elegant, distinctive, timeless, and equal to the grand passage between two great states over the most important river in the region**
6. **Address and plan for improvement of traffic problems that the CRC will exacerbate in Downtown Portland**

These goals clearly express the desire of these design professionals and civic leaders to advance, or evolve, the project from an attitude limited to solving six problems to a positive attitude that strives to both create betterment and solve problems. These UDAG measures reflect a society that is seeking to best sculpt the project into a positive addition within the urban and natural landscape of the site and region.

The C-D Straight Alignment – How Does This Play Into the Debate?

The CRC project office has only been able to demonstrate one layout and alignment that satisfies the 'SIX PROBLEMS'. This one idea is the curved downstream alignment. Almost two years ago I was asked by a few Portland area designers for my thoughts on the direction the project was taking. It was clear to me that if only one layout and alignment opportunity existed, just a single possibility as the project office claimed, then the project was acting in a responsible manner. Any insight I might therefore have would be directed to the shaping the design of this layout – an action usually done during preliminary design that usually follows EIS discovery and documentation. It was clear to me that the only value I might offer was to be certain that a better layout and alignment does not exist.

Checking with transportation design professionals I was told that the 'unprecedented' number of interchanges too closely spaced was the 'key' problem this project was coping with. This made sense and was readily apparent as the proposed freeway alignment undulates and curves to fit interchange

P-029-001 ramping criteria - so that cars could access the single freeway deck - while placing the structure above the ship navigation channel /BNSF line and below the air navigation envelopes of Pearson Airport /Portland International Airport. I knew if interchanges could be 'unbraided' from the freeway then the layout and alignment might be able to be fit into the urban context much more responsively. How might this be done?

WSDOT Roadway Design Manual provides designers with two choices when interchanges are too closely spaced. These are to use a collector-distributor or grade separated braided ramps. From the WSDOT design Manual we find:

> The minimum spacing between adjacent interchanges is 1 mile in urban areas, 3 miles on the Interstate in rural areas, and 2 miles on non-Interstate in rural areas (see Exhibit 1360-3). In urban areas, spacing less than 1 mile may be used with C-D roads or grade-separated (braided) ramps. Interchange spacing is measured along the freeway centerline between the centerlines of the crossroads.

The project office had employed a host of ramping philosophies to fit interchange ramps into the project. These consist of braided ramps, frontage roads, auxiliary lanes, short collector-distributors and other modifications to interchange ramping that 'spread out' merging lanes along a longer length of freeway. By doing this the project office was able to meet WSDOT criteria. The result is what we see today; a potpourri of ramping solutions with over a dozen conflicts in just over a mile.

The only recourse open to me was to consider a collector-distributor. Placing the collector-distributor under the mainline freeway opened up the possibility of a straight aligned freeway and greatly reduced interchange complexity which then reduced land needs. Please refer to other documents to understand technical aspects and overall advantages of this 'C-D Straight Alignment'. This notion reduces the footprint of I-5 to less than that of the existing freeway as it exceeds all the requirements of the project including satisfying 'THE SIX PROBLEMS'! For Fort Vancouver this alignment was conceptually drawn to show how freeway structures might best be shaped and placed to better serve Fort Vancouver. Here are highlights of this C-D Straight Alignment with respect to Fort Vancouver:

- 150,000 square feet of additional land becomes available within the site of the historic village
- 1,000 feet width of open ground level expanse exists between the lower park and Vancouver city streets allowing visual connection between the early platted city, village and fort
- Third Avenue extending between the fort and city street grid allows pedestrians and vehicles to move between the city, park and river
- Elevated freeway columns, as many as 70, can be sculpted, ideally by an artist, to recall the historic forest that was the western edge of the Hudson Bay Fort and trading village
- The LRT Station is placed a short three block walk from the lower park. This walk is through the 'forest' of I-5 columns suggesting an interpretive presentation of the historic context that was the area during the early HBC period. This recalls that time when the forest was the western edge of the HBC settlement

P-029-001

- Views through the I-5 column 'forest' visually link lower Vancouver, the Columbia River and hills in the distance. Views would also include a much more attractive bridge that is more easily achieved with a straight aligned bridge.

These ideas are represented in the following sketch:



Figure 1

Conceptual plan showing ground level open space between the park and river. Note that this plan is indicative of a longer term future in which the berm of the BNSF track-bed is placed on a bridge structure allowing people to pass under the railroad tracks. Dots are columns indicative of what might be expected with the elevated freeway.

This plan would be indicative of the period that transitions the HBC to the formalized street grid of the City of Vancouver. These periods are represented with the following plans from the Fort Vancouver web site:



P-029-001

Figure 2

Hudson Bay Period. The western edge of the settlement was a forest during this period. This suggests that the park had a close visual relationship with the Columbia River looking to the south. The western edge was a close in forest with grass lands and farming to the east.



P-029-001

Figure 3

The period of US Fort Vancouver and Vancouver Barracks. Notice that the western edge of Fort Vancouver has the City of Vancouver platted as we see today. This period was the formalization of the fort as the urban center on the north shore of the Columbia River. Civic life was the synergy between the fort, village and early city during this period. The forest was removed and urban life spread downstream along the shore of the Columbia River.

These ideas suggest one possible strategy to shape freeway and bridge structures to better Fort Vancouver. However, these are but a few notions that represent responsive design. It is fair to assume that the actual design, yet to occur, will evolve to be much better as creative, skilled, experienced architects, artist and engineers are employed.

A bit more detail

Clearly choices are possible. The downstream alignment proposed by the CRC project office might best be described as the worst possible alignment that, if compared with the C-D Straight Alignment, proves that the C-D Straight Alignment is not the only possible layout and alignment that satisfies the needs for alternative 3 – bridge replacement and LRT. Why is this important? The C-D Straight Alignment solves the six problems and has contextual advantage. The reasoning is that to limit the project to only one possible alignment and layout during EIS discovery is to put the project at risk. This is what is happening now as the CRC project insists the curved downstream alignment is the only possible solution.

P-029-001 An overview comparison of the two ideas is striking. The following images share these contrasts:

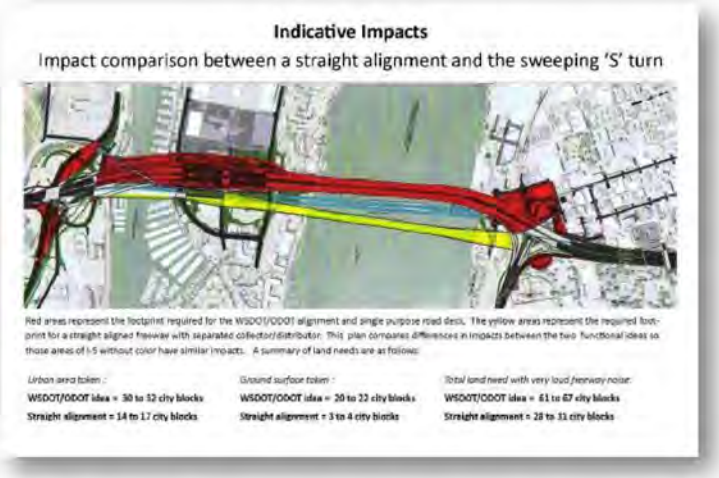
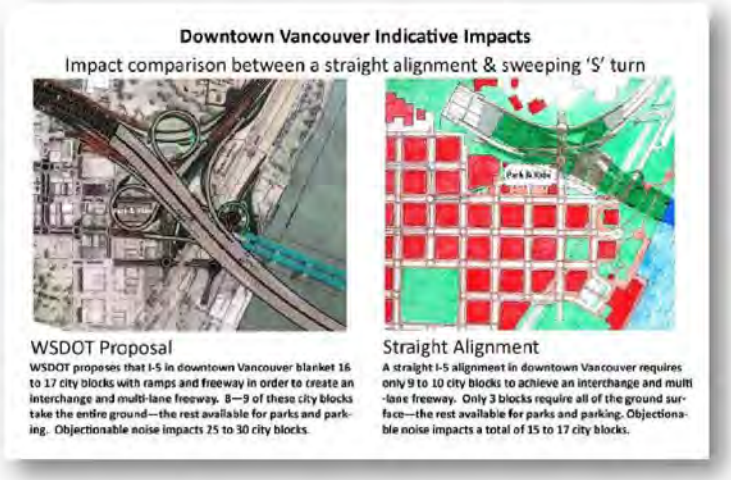


Figure 4

Comparison of CRC downstream alignment with the C-D upstream straight alignment. This is an overall sketch to share the comparative footprint of the C-D Straight Alignment with the CRC curved downstream alignment. Red areas represent land that will be required if the CRC curved downstream alignment is use that is not needed if the C-D Straight Alignment is selected. Yellow is land needed for the C-D Straight Alignment that is not required if the CRC curved downstream alignment is selected. The blue lines are the existing twin I-5 steel truss bridges.



P-029-001

Figure 5

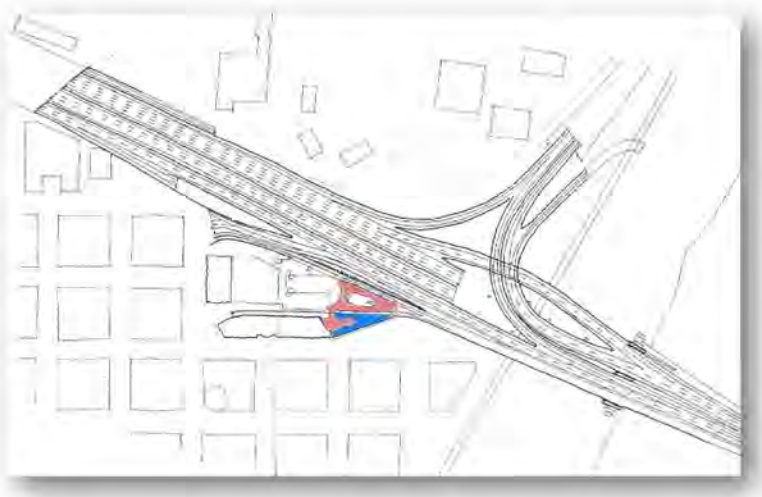
Side comparison of CRC downstream curved alignment (left) with the C-D straight alignment (right). Please note that the plan on the left shows the elevated freeway while the plan on the right shows the ground level with the elevated freeway shadow shown in dark green.

P-029-001 The following two sketches are better images of the layout possible for the C-D Straight Alignment near Fort Vancouver:



Figure 6

Surface layout showing indicative pedestrian pathways between the park, lower downtown and Columbia River (light brown color). Yellow city blocks are new city blocks that would not be possible with the proposed CRC downstream alignment.



P-029-001

Figure 7

Elevated I-5 structure for the C-D Straight Alignment. Note tha the LRT station is a triangualr platform associated with a building – possiblly the proposed Pioneer Building. A small roof top pool brings the Columbia River to the elevated platform and a rail crossing connects the platform with the building which might house a museum, art center or civic activities.

Errors, Lies, Law and Hypocrisy

So what does the CRC project office have to say about the C-D Straight Alignment?

When I was forced to use public disclosure laws to determine if the CRC project office has considered the C-D Straight Alignment the response was shallow and confused. Only one document was offered that suggested any sort of review for the idea. This was a simple listing of potential issues associated with a conceptual plan of the SR-14 interchange. From this listing of potential issues the project office declared the idea to be a bad idea. The only problem with this is that these potential problems – geometric alignment issues - are not problems. The conceptual layout provided to the CRC project office more than satisfies ALL WSDOT interchange criteria and provides connections from I-5 to Vancouver that are NOT PROVIDED with the CRC downstream alignment. What is one to make of this action?

P-029-001 Assigning a staff engineer to speculate on potential problems for one interchange and then twisting these potential concerns to declare the entirety of the idea is fatally flawed is hypocrisy when the layout for the interchange is technically correct. So it turns out that the project office leaped to a conclusion based on incorrect internal review actions. But how can this be when the office declares, as Nancy Boyd stated just the other week to the Vancouver Rotary that the project office considers LOTS of alternatives by stating that:

- Through the public process all ideas were thoroughly vetted
- All considered against specific set of criteria

So it turns out that thorough vetting is declaring an idea fatally flawed because a staff engineer speculated on potential geometric concerns for one part of the idea, speculation that was in error, never bothered to share this with the public or the source of the idea and then filed this away to ignore the idea. They also made false witness to the bridge review panel and, as was related to me 'off the record' by members of the BRP, asked the BRP to create a bogus idea that sounded like the C-D Straight Alignment so as to mask the potential viability of the idea. I find it shocking that this obfuscation is declared to be thorough vetting.

Does it follow that the specific set of criteria the CRC project office uses to consider ideas is to speculate on possible problems and, based on this speculation, declare the idea to be bad? This is the story that the public records request told me. My conclusion is that the project office has lied regarding thorough vetting as shown with the meager consideration given to the idea, do not follow-up with the originator of the idea with feedback sharing how they will, or have, review the idea, internally conduct flawed reviews without quality control, are content with self-serving 'memos to the file' and allow others to think that ideas are subjected to thoughtful consideration against a specific set of criteria. It appears to me that the project office simply wanted to find a potential technical issue to declare the idea bad and then bury awareness in the deep recesses of project files.

However, a corrupt organization still must be held accountable to the laws of the land. For Fort Vancouver this is the requirement that the project act on any idea that might lessen the impact on the National Historic Reserve. This is best stated by Frank Green and Casey Liles of the CRC project office:

"An upstream alignment sets the bridge and SR14 interchange ramps closer to the Vancouver National Historic Reserve (the Reserve) at the river's edge and was determined to have greater impacts to this resource. The Reserve is protected by Section 4(f) of the Department of Transportation Act of 1966 which requires identifying prudent and feasible alternatives to avoid impacts to this land and by Section 106 of the National Historic Preservation Act. Under Section 4(f), if some impact to this land is unavoidable, all possible planning to minimize harm from use should be explored. The project has determined that it is not possible to avoid all impacts to the Reserve. Therefore, reasonable and prudent opportunities to minimize impacts shall be implemented. The downstream alignment optimizes reasonable and prudent opportunities to minimize Section 4(f) impacts."

P-029-001

- Statement made by Frank Green, Structures Engineering Manager, and Casey Liles, Highway Engineering Manager, Columbia River Crossing Project Office in an August 15 2011 memo regarding the C-D Straight Alignment.

How is it possible for the CRC project office to make this statement? With the C-D Straight Alignment layout offering clear advantages to the fort this statement can easily lead one to believe the project office is self-serving and quick to make false assumptions. One is reminded to look carefully at the two layouts as this issue must be understood comparing physical layouts –the 'fit for function' of I-5 that best serves the needs of users and neighbors. Also, I do not believe Frank Green or Casey Liles are historians, archeologists, anthropologists or experienced preservationists so it should not be up to them to make such a declarative statement once transportation issues have been found to be criteria compliant for both upstream and downstream opportunities. Until such time as both ideas are subjected to rigorous comparative analysis against criteria that the National Park Service and State Historic Preservation Officer determine is appropriate this statement is only speculation on the part of Frank and Casey.

It has been demonstrated that the C-D Straight Alignment better satisfies mobility needs for the project. The project office has never disputed this. It has also been demonstrated that the C-D Straight Alignment is safer, less expensive and will result in a more beautiful bridge. Again, the project office has never disputed this. It has been demonstrated that the C-D Straight Alignment satisfies mobility requirements, both rubber tire and steel wheel, better than the CRC project office downstream alignment. This has not be disputed by the project office.

With respect to Fort Vancouver the project office appears to be in violation of Section 4(f) of the Department of Transportation Act of 1966 and by Section 106 of the National Historic Preservation Act. This is, of course, unless the project office can put forth technical reasoning why the C-D Straight Alignment is fatally flawed. If the project office were acting in an honest and forthright manner they would presently be consulting with national and state historic preservationists to better understand how the two choices influence the historic site and work out a methodology to better understand what best serves the interest of this important cultural resource.

Based on objective measures of public integrity we appear to have a project office that may elevate Payton Place to a place with greater accountability to the public, stronger civic leadership seeking a better tomorrow and sensitivity to preserving and enhancing the historic place. Without identifying positive and proactive measures to strengthen our communities, to limit one's effort to 'SIX PROBLEMS' is to admit that we only live in a world of problems.

Hines, Maurice

From: Kevin Peterson [petersondesign@centurytel.net]
Sent: Monday, October 24, 2011 8:38 AM
To: Columbia River Crossing
Subject: Alternative 3, bridge replacement transit
Attachments: Letter regarding CRC and the C-D option.docx

Dear Project Sponsor,

Please add the attached paper to feedback on the FEIS for the Columbia River Crossing project.

Thank you,

Kevin Peterson
165 White Point Road
Friday Harbor, WA 98250
206 369 8048

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

P-030-001

Columbia River Crossing

EIS Alternative 3: Bridge Replacement with Rail Transit

Did the Project Office Adequately Evaluate Opportunities?

An alignment and layout that the CRC project office failed to consider

Alternative 3; Bridge Replacement with Transit

The preferred EIS alternative calls for the replacement of the I-5 bridge with an integrated light rail line across the Columbia River into Vancouver. The CRC project office has proposed a layout and alignment for the bridge and the five miles of freeway north and south of the bridge suggesting how this alternative would be accomplished. This solution aligns the freeway on a curved bridge placed downstream of the existing bridge and employees a potpourri of ramp philosophies to cope with too closely spaced interchanges. In 2008 this layout and alignment was declared the only possible solution that satisfied requirements of this EIS alternative.

Most people felt that this solution was expensive, intrusive, impactful and unattractive. The CRC project office has since spent time trying to modify the layout to reduce impacts but has not considered other than ancillary modifications to the concept.

In early 2010 Mr. Kevin Peterson, an architect and planner who specializes in international transportation infrastructure physical design, was asked by architects and landscape architects in Portland if another solution was possible. Mr. Peterson spent the early period of 2010 researching project history and investigating ideas that were not considered by the CRC project office. By early spring Mr. Peterson discovered an alignment and layout that appeared superior to the proposed CRC Curved Alignment.

The C-D Straight Alignment Idea

In the spring of 2010 WSDOT and ODOT was presented with an alignment and layout different from any other alignment and layout previously considered by the CRC project office. This layout proposes:

- A mainline without conflicts between Marine View Drive and Mill Plain Boulevard

P-030-001

Please see responses to Mr. Peterson's other submitted comment letter, P-029.

The LPA was determined to provide the best combination of meeting the Purpose and Need, as well as addressing the other evaluation criteria, as summarized in Chapter 2 of the FEIS. Mr. Peterson's idea was reviewed by the Bridge Expert Review Panel who chose not to recommend that CRC pursue it further. It was also reviewed by the CRC staff. The proposal had significant traffic operations deficiencies and did not hold promise that it could perform as well as the LPA or provide any substantial advantages.

P-030-001

- A separate collector distributor (C-D) roadway interconnecting Marine View Drive, Hayden Island and SR-14/Vancouver independent of the mainline that also acts as an urban arterial crossing the Columbia River and North Portland Harbor.

This option greatly exceeds functional needs for transit and vehicular requirements while having a smaller footprint than today's I-5 freeway. This option exceeds WSDOT Design Manual geometric standards and provides a better way to cope with the unprecedented number of interchanges that are spaced too close to one another in the urban context the freeway is placed.

This option is referred to as the C-D Straight Alignment because I-5 is essentially straight from south of Marine View Drive to north of Mill Plain Boulevard, a distance of almost three miles with the exception that the existing slight curve in the North Portland Harbor bridge is retained.

CRC Project Office knowledge of this option

The CRC project office was presented with this option in the spring of 2010 communicated using conceptual drawings and narrative. This presentation was done in a collegiate briefing in which Mr. Peterson shared the possibility with senior CRC project office staff. Months later it was apparent to Mr. Peterson that the project office had no intent to act on the possibility for they indicated that the material would simply be filed.

Concerned that the project office was not acting in the best interest of the public Mr. Peterson presented the idea to WSDOT headquarters. Mr. Jerry Lenzi, (title? – I think he is in charge of all WSDOT design) met with Mr. Peterson and reviewed the idea, found the idea most compelling, coordinated with the ODOT director and, considerate of the critical time line for the project, requested that the idea be presented to the Bridge Review Panel (BRP) for review. Most curiously he did not appear to follow-up with the CRC project office.

Mr. Peterson presented the idea to the BRP during a formal meeting as this panel was about to start a week long review of the bridge. However, after the idea was presented CRC project staff instructed the BRP not to review the idea. This directive, which I assume based on informal conversations with BRP members, limited review to only the bridge and did not consider fundamental issues like interchanges or the applicability of a collector-distributor. The C-D Straight Alignment was not reviewed, or considered, by the BRP even though the public was led to believe it was reviewed and discredited.

P-030-001

The first review of the C-D Straight Alignment by the CRC project office occurred in October of 2010, almost a half year after the project office was presented with the idea. Unfortunately this review only considered one interchange, SR-14 and I-5, and was subsequently shown to be completely in error. This 'review' simply speculated that geometry might not satisfy WSDOT standards at this interchange and, therefore, was the CRC project office basis to reject the entire C-D Straight Alignment. When Mr. Peterson finally received this review, in the summer of 2011 after having to make a formal records request, was the geometric 'speculation' shown to be completely in error.

It should be noted that if the CRC project office, the BRP, WSDOT or ODOT shared with the public that the BRP did not consider the C-D Straight Alignment Mr. Peterson could have been immediately taken to bring this inaction to the attention of public officials. Also, if Mr. Peterson was informed of the CRC project office October review in a timely manner then the erroneous review would have been pointed out and corrected. As it is the CRC project office only provided this information to Mr. Peterson after a formal records request was made almost a year and a half later! At no time, from the spring of 2010 to the present, has the CRC project office provided Mr. Peterson with any feedback on the C-D Straight alignment or, more importantly, the CRC project office has never acknowledged that this option existed. **This means that the public or project sponsors were never informed that this option existed.**

Specific benefits of the C-D Straight Alignment

The following is a listing of the significant benefits of the C-D Straight alignment contrasted with the CRC project office proposed curved downstream alignment:

1. Capital costs appear to be 300 to 700 million less that the CRC curved alignment

2. One efficient transportation investment serves both interstate and local needs providing the functional benefit of two bridges - an express freeway and urban arterial. One transportation platform – one bridge – satisfies both functions. Connecting Vancouver, Hayden Island and North Portland via an urban arterial provides freight mobility and local movements without entering the high speed freeway traffic environment.

P-030-001

3. The idea requires slightly less land than the existing I-5 freeway. What is proposed in the CRC curved alignment requires taking a million and a half MORE square feet of precious urban or park land!

4. Compared with the CRC curved alignment, 33 to 36 fewer urban city blocks of land are not subjected to the noisy footprint of the freeway unless massive view blocking noise barriers are built.

5. Hayden Island can evolve into a meaningful and great transit friendly pedestrian community of between 35 to 40 contiguous city blocks of parks, mixed-use development and urban uses where many thousands can live and work adjacent to the Columbia River within walking distance of high capacity transit – outside the noisy footprint of the freeway. The proposed CRC curved alignment bisects Hayden Island into two halves separated by a 550' to 700' expansive freeway 'no-man's land'.

6. Vancouver and Fort Vancouver reconnect with each other and the river with park and city streets. The LRT station is a short three city block walk from Fort Vancouver Park. Third Street becomes an important surface connector and gateway to Vancouver and Fort Vancouver Park.

7. Land need in the Fort Vancouver Reserve archeological site of the historic village is +/- 130,000 square feet less than the existing freeway and +/- 150,000 square feet less than what the CRC project office proposes with its downstream alignment. This is with a straight upstream alignment! The Reserve is protected by Section 4(f) of the Department of Transportation Act of 1966 which requires identifying prudent and feasible alternatives to avoid impacts to this land and by Section 106 of the National Historic Preservation Act. Under Section 4(f), if some impact to this land is unavoidable, all possible planning to minimize harm from use should be explored. The C-D Straight Alignment is therefore the only alignment and layout choice that best satisfies federal law.

8. Bridge aesthetics are vastly superior with a single beautiful cable stay bridge likely to be less costly than the two anonymous truss bridges proposed today. Landside freeway aesthetics and landscapes are vastly superior and able to compliment an urban context with architectural treatment. The freeway across Hayden Island becomes a world model for how urban use near a freeway can be viable and attractive.

P-030-001

9. Future transportation functions like commuter rail, high speed rail, additional LRT lines, 'smart' car technologies and additional vehicular capacity are more easily integrated. Capacity increases to 11,000 vehicles per hour per direction is possible with the LRT line or the 'transportation platform' infrastructure investment can be modified to add more high capacity transit including at least one additional rail line like commuter rail. The idea should provide for more than a half century of growth that is not presently considered – a period of time possibly embracing the entire span of this century. This assures today's investment buys a 'transportation platform' having optimal viability a hundred years or more into the future. This allows many future generations a 'transportation platform' that is better able to serve the mobility needs these future users will determine best serves what their needs require.

10. In-water pier disturbances are 12 to 18 piers in the Columbia River plus 11 to 15 piers in North Portland Harbor with the CRC downstream curved alignment for a total of 23 to 33 in-water disturbances. In comparison the C-D straight alignment has 4 to 10 piers in the Columbia River plus 4 piers in North Portland Harbor for a total of 8 to 14 in-water disturbances. Bridge shadows cast on the river is half that of the proposed solution. Environmental impacts are greatly reduced.

11. Conflicts on the mainline are reduced from eleven to four and curves are removed with a reduction in the accident rate on the mainline by +/- 70%. This means that commute period accident caused delay might be expected every other week for the C-D straight alignment contrasted with one or two delays per week with the CRC curved alignment. Twice as many people can be expected to die or be injured on the CRC proposed design.

Two negatives arise from this alignment and layout. These are:

- A change may cause a project delay. It should be noted that if the CRC project office acted in a responsible manner this delay may not have been required.

- The hotel on Hayden Island will place the freeway closer and this may necessitate reconstruction of the west wing of the hotel.

P-030-001

Process Comments

Evaluating alternatives within an EIS process requires consideration of physical layout in order to understand impacts of the idea. This vetting is valuable in two regards. First is that any physical configuration created in the very early 'discovery' of an EIS alternative must assume a reasonably 'worst case' physical consequence in order to be fully confident that the EIS evaluation does not understate impacts. This is important from a regulatory sense as many factors must be weighed and evaluated. For the CRC these regulatory factors include navigational clearances and airport airspace as the bridge and freeway is sandwiched between these 'space envelopes'. For example, the FAA put forward desirable airspace guidance that suggested the airspace is better protected if the bridge structure is lower. The project office then made an assumption as to the glide slope felt appropriate for Pearson Airport. This glide slope assumption made by the project office, as best as I can determine, is a 34:1 slope. Two possibilities exist as to why this glide slope is used. One is that this is the necessary glide slope for a precision ILS approach and the other is that this is the glide slope needed to clear existing terrain. However, the likely, and anticipated, regulatory decision is that currently used by the airport, City of Vancouver and other airports having the similar characteristics. This is a 20:1 glide slope. For this not to be the glide slope will cause the airport to make major changes and preclude the approved waterfront master plan and potentially impact thousands of utility runways throughout the United States. Unfortunately, CRC project documents do not explain why they are using a glide slope other than 20:1.

From this 'worst case' layout comes a much more informed appreciation of actual impacts and regulatory needs that, in turn, open up possibilities and opportunities that could not have been considered earlier. The project failed to 'sit back' and objectively appreciate what was 'discovered' as part of the DEIS process. Instead, the project assumed that they had identified the only reasonable solution for the alignment and layout of the project. This is placing the bridge downstream using a potpourri of interchange ramp techniques to satisfy design criteria and not bothering to seek a better layout or alignment opportunities. What changes have occurred were to mitigate negative aspects of the DEIS layout and alignment consistent with refinements for a project during preliminary design. What Mr. Peterson did was 'sit back' and evaluate project needs with the understanding brought about in DEIS discovery. He was then able to question certain erroneous assumptions and, not biased by earlier prejudice, seek an optimal layout and alignment for EIS Alternative 3: Bridge Replacement with Rail Transit.

When the CRC project office was informed of this layout and alignment they should have immediately subjected the idea to a careful and deliberate review. This could have been

P-030-001

easily accomplished within a month suggesting that the CRC project office should have informed project sponsors that another layout and alignment possibility exists. By mid-summer 2010 the project office could have placed this layout and alignment idea into a parallel conceptual design track that would have allowed the project to switch focus by late fall 2010 if the idea proved to be feasible.

Feasibility

The C-D Straight Alignment has been informally evaluated by a number of transportation planners, bridge engineers and large project managers. These people, all employed by governmental agencies or consultants that work for local, state and federal governments have provided this input to Mr. Peterson confidentially. None of these people have found 'fatal flaw' errors in the idea, all have found the idea to be significantly superior to the CRC curved downstream alignment, all have shared input that might make the idea even better.

CRC Project Office Actions

The CRC project office, and WSDOT senior leaders, all claim that the C-D Straight Alignment idea was carefully considered. These statements are inconsistent with actions taken by the CRC project office if the Public Records Request of August, 2011 included all information pertaining to review of the C-D idea which uncovered the single review action - the October 2010 review of the SR-14 interchange. Note that this review was nothing more that incorrect speculation leading to a false conclusion. As best as can be determined project staff may have discussed the idea, possible at the executive water cooler.

October 4, 2011

Nancy Boyd
Columbia River Crossing
Project Director
700 Washington Street Suite 300
Vancouver, WA 98660

Dear Nancy,

P-031-001

Last week I met with Kevin Peterson. He presented and discussed an alignment for the CRC project that seems very reasonable and creative.

In the meeting Mr. Peterson made the following claims for a straight alignment:

- More than a dozen city blocks in Vancouver and Hayden Island do not need to be taken for the bridge and the land area needed for the bridge and freeway is less than the land occupied by I-5 today; which Mr. Peterson asserts will save 1.5 million square feet of urban land.
- Expensive and massive environmentally disturbing foundations built in the Columbia River and North Portland Harbor is significantly fewer, about half, and environmental impacts, both natural and cultural, are much less.
- Project costs can be significantly reduced – with a half billion dollars saved a reasonable expectation.
- A straight freeway separating fast mainline traffic from merging traffic using a collector-distributor is safer and results in less congestion delay. Mr. Peterson suggests the accident rate may be half that of the curved downstream alignment.
- His idea looks to build neighborhoods near light rail transit (LRT) stations where many thousands of people can live and work within walking distance of stations. Station area communities, where many people can live and work, are important if the LRT investment is to be economically justified.
- Mr. Peterson insists his alignment restores 150,000 square feet of the historic village of Fort Vancouver to National Park Reserve and reconnects the historic park with the Columbia River and original city of Vancouver much like that a hundred years ago. The ability to attract more people to share the cultural resource of Fort Vancouver sounds too good to be true.
- A straight bridge can consider many attractive bridge types that are not possible with a curved alignment – many of which appear to be great icons for the region.

P-031-001

Please see the responses to Mr. Kevin Peterson's letters, P-029 and P-030.

P-031-001 It is my understanding that Mr. Peterson presented this idea to you almost a year and a half ago. What he has shared with me suggests that the CRC did not consider this idea and did little more than ignore this opportunity. He says that only one intersection layout was looked at and this was done incorrectly. I am very concerned that his idea, if a valid one, was not considered in a manner that might have validated its logic – which to me seems very simple and straight forward.

The CRC project office has spent the last six years investigating how to best replace the freeway and bridge. This effort involved many experts, engineers and community representatives. I can only imagine that the ideas put forward by Mr. Peterson must have significant problems that keep it from consideration.

Attached is a six page summary of this issue prepared by Mr. Peterson. Please let me know what is incorrect with Mr. Peterson's summary. Since this issue involves public trust and transparency a quick response is very important to me. Controversy has been part of this project for years so please provide a critique of Mr. Peterson's idea in a form that I can share with my constituents.

I'd appreciate this information by October 18, 2011. If this is not possible please let me know why.

I look forward to your prompt response,



Ann Rivers

P-031-001

Columbia River Crossing
Alternative 3 – Replacement Bridge with LRT
Physical Alignment and Layout - The CRC Project Office has this Wrong.

The Columbia River Crossing Project is more than a bridge. This multi-billion dollar project reorganizes five miles of freeway within a fragile urban context desperate for revitalization and allows the Portland LRT network to reach Vancouver. What is proposed today is little more than a single purpose complicated freeway maze barely able to meet 2030 needs with light rail attached – hardly the sort of progressive thinking we seek from a two hundred year investment!

Without question this investment must meet LRT and roadway standards of today – this is not in question. It then follows that improving the urban context and environment are relevant measures that should define what we do. Let's consider five valuable characteristics of this fragile urban context that project sponsors appear not to have adequately considered or have failed to achieve:

1. **Vancouver and Hayden Island Urban Viability**. These places are the only urban centers on the shore of the Columbia River within the expansive Portland metropolitan area. Present urban use is stunted due to the intrusiveness of I-5. To evolve viable urban use requires reasonably quiet and attractive city landscapes. **The proposed freeway fails these measures as it takes an additional 1.5 million square feet from this fragile context.**
2. **Transit Optimization**. Transit effectiveness works hand-in-glove with density, transit oriented redevelopment and easy community connections. Urban areas should be redeveloped near Hayden Island and Vancouver light rail stations as urban places where many thousands live, work and enjoy. **The proposed layout does little more than comingle stations with freeway ramps and noise.**
3. **Inequity of passage.** The eighty mile stretch of the Columbia River between Kelso and The Bridge of the Gods can only be crossed using two fast freeways. This means all urban traffic and freight mobility must cope with freeway restrictions, essentially an inequity of passage for those impeded or intimidated by fast moving freeway traffic. **This urban crossing should ease this impediment; not exacerbate the problem by comingling this slower traffic onto a very wide freeway deck.**
4. **Better than what is being replaced**. The replacement freeway should be superior to what is being replaced measured in environmental benefit and design efficiency. This means a smaller over-water footprint; fewer in-water disturbances and less land need than currently needed by I-5. Bigger is not necessarily better. Our goal should be optimizing capacity with efficient infrastructure. The measure should be the relative size of the improvement with the existing freeway. **Sadly, what is proposed is more massive, intrusive and has a large negative environmental impact.**
5. **Regional pride**. The engineering solution should be a source of regional pride valued for engineering excellence, aesthetics and environmental sensitivity. **The proposed design is forced to be anonymous due to its complicated alignment and massive ramps and will not be a source of regional pride.**

P-031-001

After the CRC project office had sorted out planning and operational choices and constraints civic leaders were presented with only one basic functional layout – just one engineering 'fit for function' design offered nearly three years ago. This is the two anonymous curved deck truss bridges and massive land hungry freeway interchanges we see today – slightly modified as one would expect doing preliminary design. Project sponsors have only added to project complexity as they are forced to manipulate this singular solution in an attempt to overcome negative aspects and public feedback. These efforts have resulted in decoration and hope that this allows community buy-in and stops debate.

Why have we not seen ideas put forward that better consider the needs of the urban setting? I believe the answer to be shocking in its simplicity – urban measures were always considered secondary and timidly addressed, often as a mitigation measure or dutiful documentation of the planning process. The project office only considers the following attributes to be appropriate for this urban freeway:

Growing travel demand and congestion
Impaired freight movement
Limited public transportation operation, connectivity, and reliability
Safety and vulnerability to incidents
Substandard bicycle and pedestrian facilities
Seismic vulnerability

These may be appropriate when contrasting 'no build' with 'tunnels' but are woefully inadequate measures to design an urban freeway and major bridge – sadly these are the measures the state is using to decide on alignments and layouts so when engineers found one solution that was used to support environmental documentation they stopped planning and proceeded into the design of this 'fit for function'.

Observing this unhappy situation one is compelled to ask what option and opportunities might have been overlooked. Two important constraints need to be observed if the preferred alternative of bridge replacement with LRT is to support the environmental understanding we now have. These are:

1. Any idea must meet or exceed the functional needs identified for the project.
2. Any idea must be kept within the Primary Area of Potential Impact used as part of the environmental analysis of the project. To be outside this boundary would cause certain aspects of the environmental work to be revised.

Let's consider important discoveries from this inquiry.

Project planners propose a freeway of between five and eight traffic lanes in each direction accessed by short collector-distributors, auxiliary lanes, braided ramps and, occasionally, normal ramps. This solution is needed to cope with interchanges spaced too close together, a river and harbor to be bridged, and the sweeping 'S' turn freeway geometry. Within the core area of this freeway only three mainline lanes are needed in each direction if interchange traffic does not merge. What might happen if

P-031-001 local traffic – movements within this dense fabric of interchanges and bridges - were accommodated on a separate collector-distributor 'bridge', operating as an urban arterial, that joins with I-5 to the north and south of this unprecedented interchange density? This idea means that shore-to-shore movements do not comingle with fast interstate traffic and huge complicated freeway interchanges can be replaced with simple intersections. This 'collector/distributor', or C-D, this idea is frequently used when freeways are placed in dense complicated urban settings. If the C-D were to operate for the benefit of local shore-to-shore movements then it might best be considered as an arterial. Placing this 'urban arterial' C-D function underneath fast moving interstate traffic requires one six lane wide bridge that greatly reducing the freeway footprint.

Is it possible to even consider this idea? The WSDOT Design Manual clearly states that a C-D or grade separated (braided) ramps are the two options open to designers when interchanges are spaced closer than one mile:

> The minimum spacing between adjacent interchanges is 1 mile in urban areas, 3 miles on the Interstate in rural areas, and 2 miles on non-Interstate in rural areas (see Exhibit 1360-2). In urban areas, spacing less than 1 mile may be used with C-D roads or grade-separated (braided) ramps. Interchange spacing is measured along the freeway centerline between the centerlines of the crossroads.

Since the C-D idea was not considered by the project office it is a worthy idea to consider. But first let's see what might be done to take the back-to-back 'S' curves out of the freeway as this will reduce accidents and open up many bridge types for possible use. For freeways and bridges to be straight is a very, very good thing!

I-5 must fit above the navigation channel of the river, pass over the BNSF railroad and stay below the glide slope into historic Pearson Airport. A series of crucial alignment and roadway geometric decisions were required to fit the bridge and freeway into the resultant available vertical space. Although project sponsors wanted a straight alignment and bridge, the glide slope issue was considered a 'fatal flaw' that forced the bridge downstream which necessitated the undesirable sweeping 'S' turn freeway geometry we are now asked to accept. This also resulted in the complicated maze of interchange ramps in the project. Investigation discovered that the CRC project office was using incorrect glide slope criteria that unnecessarily influenced freeway placement. For Pearson Airport the City of Vancouver, Pearson Airport and the FAA require and apply a 20h:1v glide slope for obstacle clearances, a slope proven to be safe at thousands of similar runways. The CRC office was using an unusually flat 34h:1v glide slope. If the correct glide slope were to be applied a single bridge fits on a straight alignment from Mill Plain to the south edge of Hayden Island eliminating the need for multiple sweeping 'S' turns.

Most collector-distributors are placed to the outside of the mainline. Why not place the C-D under the mainline? This action reduces the footprint to less than the existing I-5 freeway occupies today! This reduced land need recovers 150,000 square feet of the historic village in Fort Vancouver presently overlaid with freeway ramps. The proposed downstream interchange geometry at Fort Vancouver requires more land within the park than I-5 currently takes.

P-031-001 Historic Fort Vancouver Reserve is protected by Section 4(f) of the Department of Transportation Act of 1966 which requires identifying prudent and feasible alternatives to avoid impacts to this land and by Section 106 of the National Historic Preservation Act. Under Section 4(f), if some impact to this land is unavoidable, all possible planning to minimize harm from use should be explored. Clearly, it is best to simply avoid impacts. It's also the law to avoid impacts if a layout accomplishes this requirement!

A year and a half ago the CRC project office was presented with this idea – which is referred to as the C-D straight alignment. Here are attributes of this idea measured against the current scheme proposed by the CRC project office (CRC curved alignment):

- Capital costs appear to be 400 to 800 million less that the CRC curved alignment
- One efficient transportation investment serves both interstate and local needs providing the functional benefit of two bridges - an express freeway and urban arterial. One transportation platform – one bridge – satisfies both functions.
- The idea requires slightly less land than the existing I-5 freeway. What is proposed in the CRC curved alignment requires over a million and a half MORE square feet!
- Compared with the CRC curved alignment, 33 to 36 fewer urban city blocks of land are not subjected to the noisy footprint of the freeway unless massive view blocking noise barriers are built.
- Hayden Island can evolve into a meaningful and great transit friendly pedestrian community of between 35 to 40 contiguous city blocks of parks, mixed-use development and urban uses where many thousands can live and work adjacent to the Columbia River within walking distance of high capacity transit – outside the noisy footprint of the freeway. The proposed CRC curved alignment bisects Hayden Island into two halves separated by a 550' to 700' expansive freeway 'no-man's land'.
- Vancouver and Fort Vancouver reconnect with each other and the river with park and city streets. The LRT station is a short three city block walk from Fort Vancouver Park. Third Street becomes an important surface connector and gateway to Vancouver and Fort Vancouver Park.
- Land need in Fort Vancouver is less than the existing freeway and less than what the CRC project office proposes with its downstream alignment. This is with a straight upstream alignment! This also is the only alignment and layout choice that meets federal law.
- Bridge aesthetics are vastly superior with a single beautiful cable stay bridge likely to be less costly than the two anonymous truss bridges proposed today. Landside freeway aesthetics and landscapes are vastly superior and able to compliment an urban context with architectural treatment. The freeway across Hayden Island becomes a world model for how urban use near a freeway can be viable and attractive.
- Future transportation functions like commuter rail, high speed rail, additional LRT lines, 'smart' car technologies and additional vehicular capacity are more easily integrated. Capacity increases to 11,000 vehicles per hour per direction is possible with the LRT line or the 'transportation platform' infrastructure investment can be modified to add more high

P-031-001

capacity transit including at least one additional rail line like commuter rail. The idea should provide for more than a half century of growth that is not presently considered – a period of time possibly embracing the entire span of this century. This assures today's investment buys a 'transportation platform' having optimal viability a hundred years or more into the future. This allows many future generations a 'transportation platform' that is better able to serve the mobility needs these future users will determine best serves what their needs require.

- In-water pier disturbances are 12 to 18 piers in the Columbia River plus 11 to 15 piers in North Portland Harbor with the CRC downstream curved alignment for a total of 23 to 33 in-water disturbances. The C-D straight alignment has 4 to 10 piers in the Columbia River plus 4 piers in North Portland Harbor for a total of 8 to 14 in-water disturbances. Bridge shadows cast on the river is half that of the proposed solution. Environmental impacts are greatly reduced.
- Conflicts on the mainline are reduced from eleven to four and curves are removed with a reduction in the accident rate on the mainline by +/- 70%. This means that commute period accident caused delay might be expected every other week for the C-D straight alignment contrasted with one or two delays per week with the CRC curved alignment.

These advantages are comparatively huge!

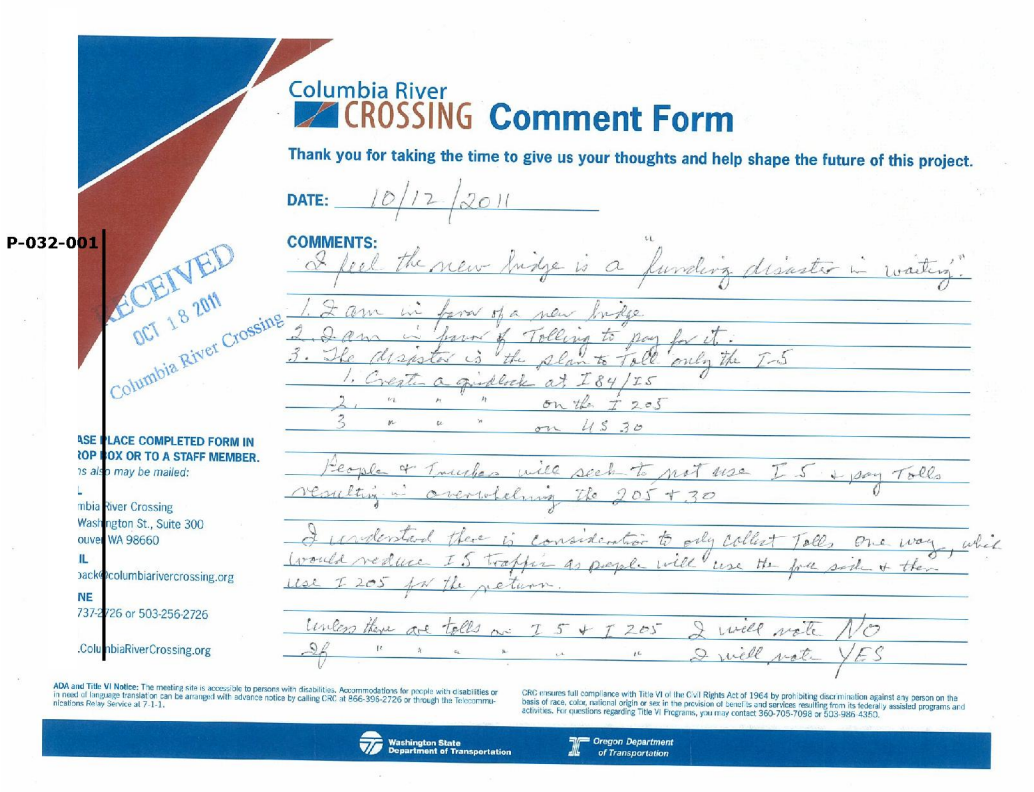
During the past year and a half Oregon and Washington Departments of Transportation have shunned this potential opportunity. This makes no sense knowing the current proposed layout forever relegates Hayden Island and lower Vancouver to permanent second class urban status for communities served by LRT. No small wonder many people north of the river view LRT as a waste of money.

Sadly, WSDOT or ODOT have steadfastly avoided consideration of the idea. Local leaders and WSDOT management did ask bridge engineers of the Bridge Review Panel to consider the idea only to be instructed by CRC staff not to consider the idea. However, the CRC project office did take one cursory look at the geometry of one interchange for the C-D idea. This 'review' speculated at possible concerns and concluded the idea was flawed. This 'review' has since been shown to be wrong. All of the speculative concerns raised were wrong or inappropriate; all conclusions reached were in error.

Discounting design refinement typical in preliminary and final design, the project office continues to maintain that only one possible freeway layout and one alignment meet the needs of the preferred alternative. This is not the case as proven by the C-D straight alignment and layout. Knowing and ignoring this alignment and layout; the project office is now proceeding with a design that is wrong. The project office continues to spend tens of millions of tax dollars that will result in burdening taxpayers with a billion dollars in payments needed to fund 500 million dollars of concrete and steel that is not needed. The project office continues to violate Section 4(f) of the Department of Transportation Act of 1966. The project office fails to consider alignments and layouts that better serve project needs discovered by environmental work.

P-031-001 The project office is placing this project at risk simply because staff prematurely thought only one alignment and layout satisfied EIS Alternative 3!

P-032-001



Columbia River CROSSING Comment Form

Thank you for taking the time to give us your thoughts and help shape the future of this project.

DATE: 10/12/2011

COMMENTS:

I feel the new bridge is a "funding disaster in waiting".

1. I am in favor of a new bridge
2. I am in favor of Tolling to pay for it.
3. The disaster is the plan to Toll only the I-5
   1. Create a gridlock at I84/I5
   2. " " " on the I 205
   3. " " " on US 30

People & Truckers will seek to not use I 5 & pay Tolls resulting in overwhelming the 205 & 30

I understand there is consideration to only collect Tolls one way, which would reduce I 5 traffic as people will use the free side & then use I 205 for the return.

Unless there are tolls on I 5 & I 205 I will note NO
If " " " " " " I will note YES

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ASE PLACE COMPLETED FORM IN ROP BOX OR TO A STAFF MEMBER.
ns also may be mailed:
L
mbia River Crossing
Washington St., Suite 300
ouver WA 98660
IL
back@columbiarivercrossing.org
NE
737-2726 or 503-256-2726
.ColumbiaRiverCrossing.org

ADA and Title VI Notice: The meeting site is accessible to persons with disabilities. Accommodations for people with disabilities or in need of language translation can be arranged with advance notice by calling CRC at 866-396-2726 or through the Telecommunications Relay Service at 7-1-1.

CRC ensures full compliance with Title VI of the CVI Rights Act of 1964 by prohibiting discrimination against any person on the basis of race, color, national origin or sex in the provision of benefits and services resulting from its federally assisted programs and activities. For questions regarding Title VI Programs, you may contact 360-705-7098 or 503-986-4350.

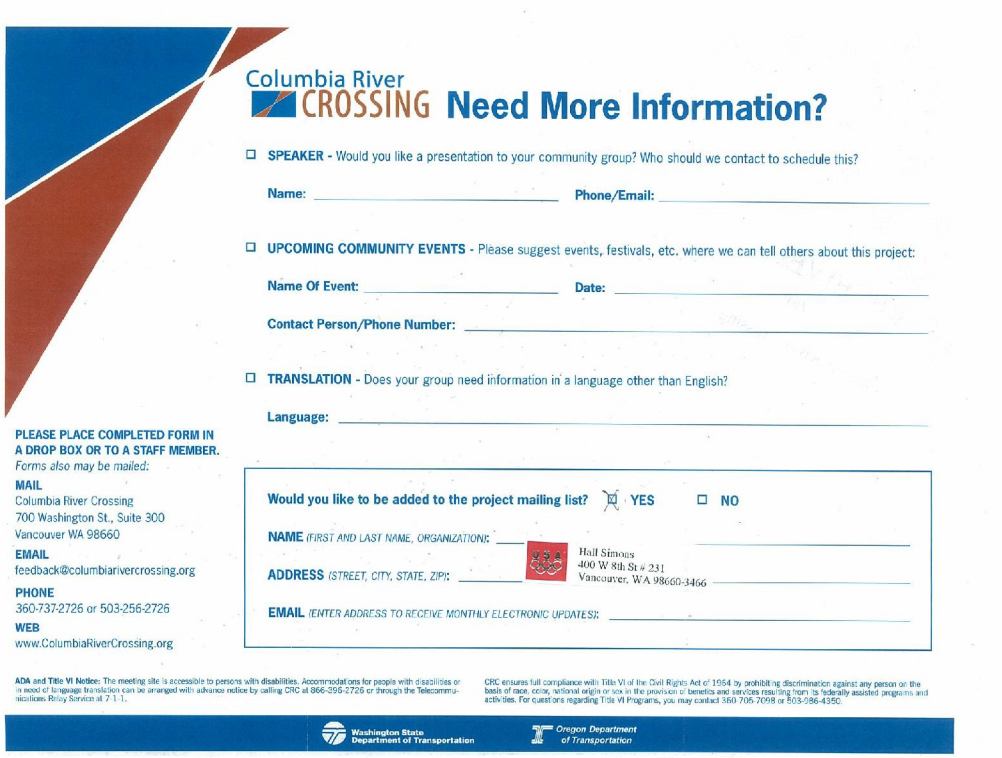
Washington State Department of Transportation
Oregon Department of Transportation

P-032-001

Under existing conditions, trips already divert to I-205 and would continue to do so under the No-Build Alternative because of the unreliability of, and congestion in, the I-5 corridor. With the CRC improvements to I-5, many of those diverted trips would shift to I-5 because it would be a shorter and more reliable trip than I-205. Tolling the I-5 crossing causes some additional trips to shift to I-205 in order to avoid the toll. The net difference in the number of trips crossing on I-205 is only slightly higher with the CRC project than without it.

With few exceptions, federal statutes do not permit tolling of an existing interstate highway without associated improvements. FHWA does have pilot programs that allow state departments of transportation to apply for the approval to toll a facility. The project sponsors are not proposing to toll the I-205 crossing as part of the CRC project. It is possible that a toll could be placed on the I-205 crossing in the future, separate from the CRC project. Section 3.1 of the DEIS and FEIS discuss the effects of the project on traffic levels in the I-5 and I-205 corridors.

In addition, tolling prior to or during construction can be used to manage demand and begin collecting the revenue. This is not currently proposed but could be implemented if approved.



Columbia River CROSSING

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☐ **SPEAKER** - Would you like a presentation to your community group? Who should we contact to schedule this?

Name: _____ **Phone/Email:** _____

☐ **UPCOMING COMMUNITY EVENTS** - Please suggest events, festivals, etc. where we can tell others about this project:

Name Of Event: _____ **Date:** _____

Contact Person/Phone Number: _____

☐ **TRANSLATION** - Does your group need information in a language other than English?

Language: _____

PLEASE PLACE COMPLETED FORM IN A DROP BOX OR TO A STAFF MEMBER.
Forms also may be mailed:

MAIL
Columbia River Crossing
700 Washington St., Suite 300
Vancouver WA 98660

EMAIL
feedback@columbiarivercrossing.org

PHONE
360-737-2726 or 503-256-2726

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Would you like to be added to the project mailing list? ☒ **YES** ☐ **NO**

NAME *(FIRST AND LAST NAME, ORGANIZATION)*: _____

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ADA and Title VI Notice: The meeting site is accessible to persons with disabilities. Accommodations for people with disabilities or in need of language translation can be arranged with advance notice by calling CRC at 866-396-2726 or through the Telecommunications Relay Service at 7-1-1.

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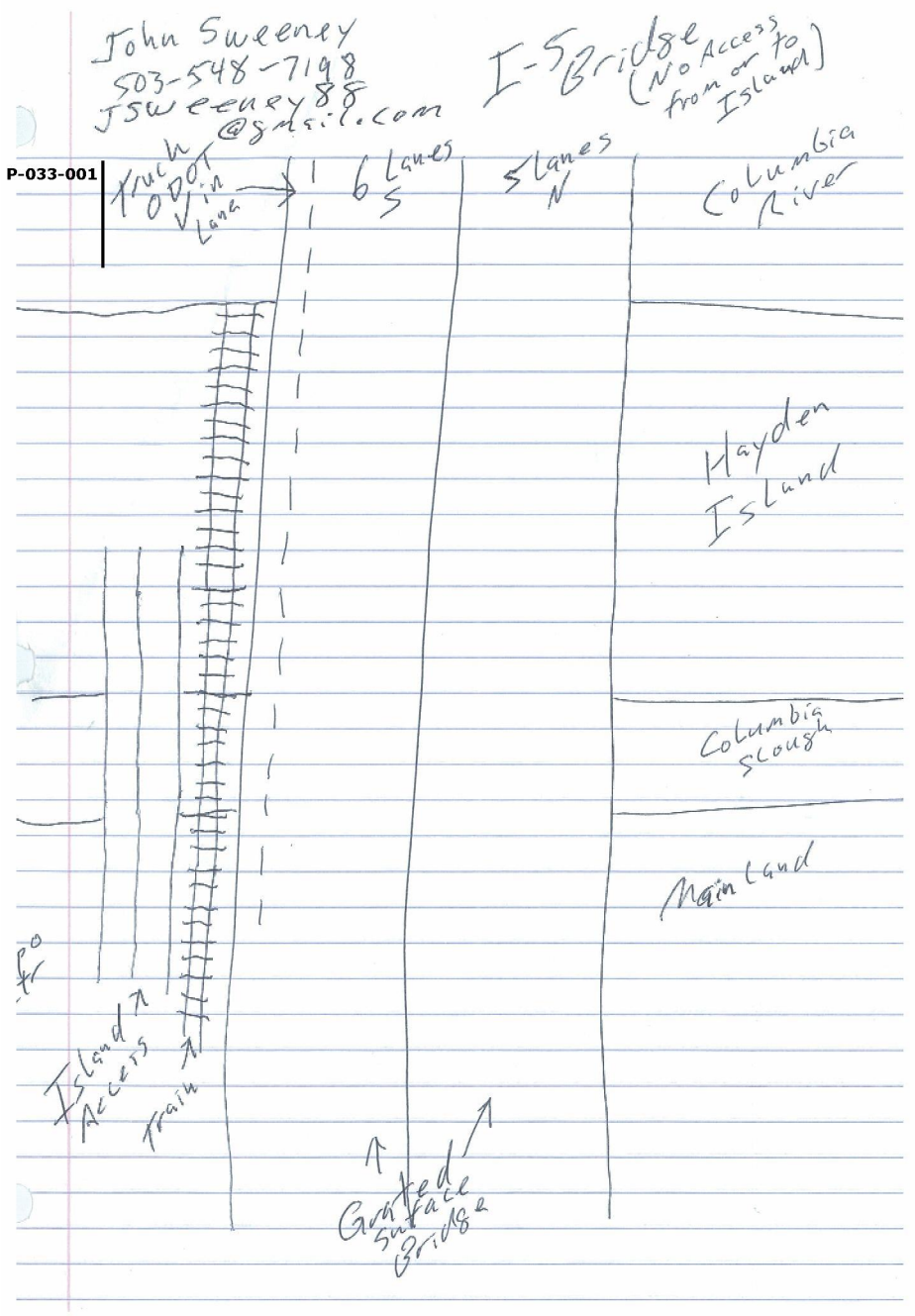

P-033-001

It appears that Mr. Sweeney is suggesting the only access to Hayden Island be via a new local bridge and that there be no I-5 access to or from Hayden Island. A similar concept was considered and rejected in the alternatives evaluation and screening process, summarized in Chapter 2 of the FEIS.

Hines, Maurice

From: lwarberg@comcast.net
Sent: Friday, September 23, 2011 5:38 PM
To: Columbia River Crossing
Subject: Comment from CRC Submit Comments Page

Categories: Orange Category

From: Louise Warberg
E-Mail: lwarberg@comcast.net
Comment or Question:

P-034-001

I'm so disappointed in the final design of the bridge. I know it's inappropriate and fruitless to say this now, but I've been saying it all along...please give us a beautiful bridge. I appreciate the effort and hard work that went into it but I'm very unhappy about the end result.

The cable-stayed design is so much grander and, relatively speaking, not much more costly. I believe the final design doesn't do justice to a major I-5 river crossing. Have you ever heard anyone say how beautiful the I-205 bridge is? I don't believe it's ugly but I do think the new I-5 design is. I wonder what future generations will think of us being so short-sighted. I suppose people will blame it on the Great Recession, but I think that's a cop-out. I really believe a wonderful design was possible.

Louise Warberg

P-034-001

The cable-stayed bridge type was carefully considered. Please see the discussion of the rationale for the composite deck truss bridge type over the cable-stayed bridge type, in Chapter 2 of the FEIS.

Hines, Maurice

From: George W [gw4cw@aol.com]
Sent: Wednesday, September 28, 2011 9:08 PM
To: Columbia River Crossing
Subject: Fwd: A Bridge

Categories: Orange Category

P-035-001

Lets get the CRC bridge buit. You have spent enough time and money in planning for this bridge. If anybody is profiting by not starting construction, it will be found out and prosecut*ion* should be swift.

The following link is why the Chinese are dominating the global economy. They are doers' not talkers as so many Americans are.

There should be a moratorium placed on all new Oregon and Washington State Hwy. construction projects that have not yet been started and shall not be started until the CRC Bridge has commenced.

World's longest sea bridge opens to traffic

Click next line

That is a bridge too far: World's longest sea bridge opens to traffic in China... but it will only hold the title for five ye.ars

Sincerely,

George Wilhelm
1414 SE 97th Ave
Vancouver, WA 98664

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1

P-035-001

The CRC project's Record of Decision, issued in December 2011, was achieved in roughly six years from the beginning of the NEPA and alternative selection process. This is comparatively quick for a large multi-agency project in the United States. The process has included robust public involvement and refinement of many design options.

Response to Columbia River Crossing's Final Environmental Impact Statement documents
10/20/11 to Heather Willis and the CRC Design team

As a Vancouver-Portland commuter for more that twelve years, I am offering my observations to challenge some of your assumptions regarding future traffic and light-rail along the I-5corridor. I also have a couple recommendations to better utilize public funds and scale down the project in light of the current economic state, and help you create a product that will be most useful to area residents.

P-036-001

1. In section 2.6.2 the report stated: "light-rail is quicker … than rapid transit." The Portland's EXPO center yellow line is slower now than the C-Tran's express bus by about ten minutes. Also in the Vancouver area, the proposed light-rail path will not go near where most people live, so they would have to either drive or take the bus to connect to it. The time to transfer and wait would be five to ten minutes, depending on coordination between the transit modes.

2. When the EXPO center light-rail was built, only a small percentage of express bus commuters switched to that, even though riding it was cheaper. What makes you think that most people would prefer this method even if you did cut five minutes out of the total commute time by extending the rail to Vancouver? It would still be slower than the express bus.

3. One faulty assumption in the design is the length of rush-hour for transit. It is not the same as the congestion of cars on I-5. The car and freight traffic will stagger to try to avoid most congested times, whereas daily transit commuters would not vary their work hours to try to avoid congestion. I believe that the past is a predictor of the future, and according to my observation, the rush-hour times in Portland have not changed from three hours twice/day over the last twelve years. Neither has C-Tran extended their express bus schedule, in fact, it was shortened by 45 minutes each way the past few years. Thus I would expect the transit peak hours to remain six hours per day total indefinitely.

P-036-002

4. The CRC is counting on rerouting about ten percent of the crossing traffic to light-rail. To allow 6,000 commuters to fit into the trains over the three-hour peak period would mean 250 people per train (trains eight times an hour). The trains have to be short due to short blocks in downtown Portland, and the average current train style seats 100 people to a train. If people have to stand most of the time, they will quit taking the train and go back to driving. Also it is not possible to increase train frequency, since so many other trains will converge onto the same bridge and streets in Portland. Off-peak hours, the train may be used for recreational, doctor and shopping trips to avoid paying the toll. Even then to keep it running every fifteen minutes may be too much.

P-036-003

5. The report also stated that light-rail overall is cheaper than rapid transit. It would hold true if there was not the need for both. The cost of light-rail for 2,000 to 3,000 possible commuters would not be very cost-effective. If 70% of commuters prefer to get there faster -by bus- than cheaper –by train-, it would make more sense to invest money into the rapid transit to ensure busses can better keep their schedules. Also this rapid transit lane could be used by long-distance freight. It would be very beneficial to the businesses to get the freight through faster regardless the time of day.

P-036-001

It should be noted that even with the light rail extension, many C-TRAN express routes are expected to continue service between Clark County and Portland. Information on which bus routes would be truncated in Vancouver can be found in Section 2.2.2 of the FEIS.

As congestion increases on the corridor, bus routes that share general purpose traffic lanes would face increased travel time. Because light rail transit has its own guideway, it will offer more consistent travel and will not be subject to traffic congestion in the corridor. Modeling indicates that light rail would offer a time savings compared to buses in the design year of 2030.

Freight traffic will try to avoid the most congested periods. However, it is predicted that overall traffic volumes will continue to rise. The increase in traffic volume on I-5 means that more people are using the corridor than the capacity of the highway can serve. This excess traffic volume must be accommodated either by extending the peak traffic hours (and associated congestion), or by transferring to other routes or modes.

P-036-002

It is hoped that, much like in Portland during peak periods, the light rail system will be heavily utilized in Vancouver. A train with 250 passengers is well utilized, but still has remaining capacity. Considerable attention has been paid to the capacity of the trains, stations, and park and rides. There are industry standards that have been applied. There has also been considerable outreach to the public in order to understand what conditions would be most desired.

System modifications will enable more trains to travel through Portland to accommodate the expanded system. The improvements to the Steel Bridge, which are described in the FEIS, are an example of such improvements. The project will modify system components on the Steel

P-036-004

6. To have three parking lots or structures for light-rail commuters in Vancouver seems excessive. If the expected peak ridership drops from 6,000 to 2,400, perhaps 1,000 people would need parking throughout the day. What makes you think that the commuters from Vancouver would give up their cars and ride the train to work? Congestion is not so bad that they would do that. Maybe 20% of the current drivers to downtown would do that to avoid paying the toll, but only if they are assured parking availability downtown, or if taking the connector bus is convenient.

7. Also I did not find anywhere in the report how you keep other people, like college students, from parking in the Vancouver park-ride facilities. Will you charge for parking to keep them out? The cost of parking should be less than double the toll to keep the incentive to hop on the train. Would $3 per day charge for parking be enough deterrent to keep non-train riders out? The average parking charge anywhere downtown is $5 or more per day. Also could the revenue from parking be offset against what is being charged for tolls?

P-036-005

8. Most commuters do not have downtown as their destination. To transfer to the connecting trains would take too long for most people to be convenient way to get to work. It appears the extensive TRI-MET light-rail network won't be used much by light-rail riders from Vancouver, unless their destination is the Lloyd Center area.

P-036-006

9. It seems the traffic model used to predict future congestion is overly aggressive and does not match the past rates. The northbound HOV lane has stayed at 3 hours since they opened it. The congestion thus has remained at about six hours per day for the past ten years or so, and would not increase to 15 hours in twenty years. Please adjust your model to scale down the project to better represent the future need.

P-036-007

10. The CRC project should be phased according to need and availability of funds. The bridge and its on- and off-ramps are the most important, given the earthquake-risk and need for lifting of the current bridge. Then the bottlenecks southbound at downtown Portland exits and I-84 interchange need fixed to prevent backups north. The northbound I-5 needs smoother transitions from the Fremont Bridge and the Delta park/Marine Drive entrances. Then the other interchanges may be phased in as money becomes available.

P-036-008

In conclusion, I would highlight the need to scale down your traffic model of congestion, the light-rail usage predictions and the need for parking in downtown Vancouver. I would also like to see you create a separate lane for express-bus/freight combination for improved travel times for majority of users. Also phasing the project according to need and availability of funds makes sense. I would appreciate if my insight and suggestions would be taken to heart and considered in the planning and final design of this project.

Sincerely,

Helena Abernathy
21512 NE 373rd St.
Yacolt, WA 98675

Bridge to enable slightly higher speeds, which will improve the network functionality and allow for more trains from Vancouver.

P-036-003

As illustrated in the FEIS, and summarized in the Executive Summary, light rail would better serve transit riders than bus rapid transit (BRT) within the CRC project area because it:

- Would carry more passengers across the river during the PM peak
- Result in more people choosing to take transit
- Have faster travel times through the project area
- Result in fewer potential noise impacts
- Would have lower costs per incremental rider than BRT

Additionally, light rail is more likely to attract desirable development on Hayden Island and in downtown Vancouver, which is consistent with local land use plans.

Allowing freight to use the exclusive bus rapid transit lane would add additional traffic to that lane further increasing the bus rapid transit travel time.

P-036-004

Both current and future land use is one of the criteria used to determine the locations of proposed transit facilities and park and rides. Other considerations include traffic impacts, property impacts, and overall transit operations. The five proposed stations will support current and planned residential and commercial development and related services. As an example, the Clark College terminus station will serve a community and senior center, a community college, and the Veterans Administration campus.

These specific stations and park and rides, with their proposed parking capacities, are tested as part of therigorous analysis completed to satisfy the requirements of the Federal Transit Administration. The FTA and the local agencies have decades of experience in estimating ridership and facility demand. Their projections are validated through years of such studies, and calibrating the projection methods and models with data from completed projects.

P-036-005

There are many transit trips that would not be directly served by the proposed light rail transit extension. However, the transit ridership forecasts indicate that there is a very large demand for this service and that a significant number of passengers would ride the proposed light rail extension. The transit ridership forecasts are based on extensive information about the projected origins and destinations of commuters and other travelers, as well as information on the transportation system and performance. The actual ridership projections and discussion are in Section 3.1 of the FEIS.

P-036-006

By 2030, the region's population is expected to increase by one million people. This increase will result in more people needing to travel between home, work, school, recreation, etc. In 2005, 135,000 vehicles crossed the Columbia River on the Interstate Bridge, which led to 4-6 hours of congestion each weekday. By 2030, 184,000 are predicted to cross the river, which would lead to 15 hours of daily congestion if no action is taken.

Congestion occurs when vehicle demand is greater than a transportation system's capacity. It results in slower speeds and increased travel times. CRC defines congestion as vehicles traveling less than 30 mph. The Columbia River Crossing project uses information gathered from Metro's nationally-recognized travel demand models to determine the project's

effect on congestion. These models predict trip frequency, types or modes of transportation, destination, and time of day. Transportation planners use these models to analyze the effects of such factors as increased population and employment, transportation improvements, and new developments on the transportation system.

Based on the Metro model's past ability to predict transportation effects, the CRC project is confident in the data received from Metro and uses it to determine what impact the project will have on congestion. The improvements proposed by the project to the highway and seven interchanges will help better accommodate increased future vehicle traffic. New auxiliary lanes and longer on/off ramps will allow safer and more efficient merging and weaving to enter or exit the freeway. Narrow lanes and shoulders will be widened to current standards. Shoulders will be added where they are currently missing. All of these changes will improve the flow of traffic in the bottleneck area of the Interstate Bridge.

P-036-007

The evaluation of the five alternatives in the DEIS was preceded by an extensive evaluation and screening of a wide array of possible solutions to the CRC project's Purpose and Need statement. Chapter 2 of the DEIS (Section 2.5) explains how the project's Sponsoring Agencies generated ideas and solicited the public, stakeholders, other agencies, and tribes for ideas on how to meet the Purpose and Need. The interrelationships of the interchanges requires a comprehensive solution in the corridor. However, the project is actively working to identify meaningful and efficient construction phasing to better adapt to the unique revenue challenges of recent years.

P-036-008

Thank you for your comments. Please refer to the responses above.

Hines, Maurice

From: Maye Thompson/Doug Allen [mayedoug@spiritone.com]
Sent: Sunday, October 23, 2011 1:00 PM
To: Columbia River Crossing
Subject: Columbia River Crossing FEIS Comments
Attachments: feiscomments.doc

SUBJECT: Columbia River Crossing FEIS Comments

(comments also attached as an MS-Word document)

P-037-001

I provided extensive comments on the CRC Draft EIS. Although those comments have been noted in the FEIS, they have not been dealt with in an adequate fashion. Essentially all of the flaws in the DEIS that I pointed out remain in the FEIS.

At the heart of the problem is the same flawed "No Build" option that is the basis for the "Purpose and Need" and that is used to justify the Locally Preferred Alternative. This flawed No Build option comes from straight-line projections of traffic growth, projections that have no scientific basis in rational statistical analysis or the behavioral sciences.

The traffic and congestion predictions in the No Build option were buttressed by population, employment, and trip-making projections flowing from the politically determined zoning in Clark County, not from any valid economic science regarding future growth.

The LPA was predetermined, not based on a valid DEIS process. Those outside the process can not, of course, know whether the flawed No Build option is the source of this predetermination, or whether it was ginned up to support a predetermined outcome, but the result is the same. The fact that then Regional Administrator David Cox described the predetermined outcome well in advance of the DEIS, was noted in my DEIS comments, but not adequately addressed. The FEIS seems to simply pound on the table and assert that the facts are so strongly in favor of the LPA that any appearance of early bias is simply acceptance of those putative facts.

The one major change in the FEIS, use of the "MOVES" model, does nothing to improve the original flaws. The original flaw was to analyze the behavior of vehicles, regarding their energy use and emissions of pollution under presumed operating scenarios, rather than analyzing the driving behavior of human beings in the long term. This flaw was not corrected.

As a result, the DEIS, and now the FEIS, have come to preposterous conclusions regarding traffic, congestion, energy-use, toxic pollution, and emission of greenhouse gases. People are not so stupid that they will continue to attempt to drive routes that become increasingly congested. The "four step" traffic modeling that was used in the CRC EIS process is notorious for ignoring the intelligence of people in the long run.

The "four step" approach is also notorious for ignoring the potential for increased transit ridership when starting from a base case, such as we have in Clark County and the "bridge influence area" of substandard existing transit service.

The entire EIS process was an exercise in deliberately ignoring or downplaying the potential for using tolling, transit, and low-cost options, by holding up the flawed No Build traffic projections. Staff adamantly claimed that low-cost options would not meet the "purpose and need." The FEIS is simply further table-pounding to reinforce this unsupported claim.

Actual traffic volumes, in the period subsequent to the CRC EIS analysis, prove that the CRC process was fatally flawed, and should be declared void. I would not suggest remanding this process to those who have spent much more than $100 million in such a flawed manner. Any further analysis of highway and/or transit across the Columbia River between Portland and Vancouver must be done under closer scrutiny

P-037-001

Some updates were made to the traffic modeling after the DEIS, as described in Section 3.1 of the FEIS, although none of the changes to either the modeling or the No-Build were as significant as Mr. Allen has recommended. Please see the responses to letter P-047 regarding your comments on traffic, population and employment projections, the travel demand modeling, low cost options, tolling, transit, fluctuations in actual traffic volumes, and the environmental impacts based on the traffic forecasts.

P-037-001

by those who are paying for this analysis, by people capable of studying all reasonable alternatives, and people capable of doing "least cost" planning, given the increasing scarcity of funds for infrastructure expansion.

Douglas R. Allen

734 SE 47th Ave.

Portland, OR

97215

October 23, 2011

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Douglas R. Allen
734 SE 47th Ave.
Portland, OR
97215
October 23, 2011

SUBJECT: Columbia River Crossing FEIS Comments

P-037-001

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P-037-001 Staff adamantly claimed that low-cost options would not meet the "purpose and need." The FEIS is simply further table-pounding to reinforce this unsupported claim.

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Hines, Maurice

From: George Bafus [george_camas@yahoo.com]
Sent: Sunday, October 23, 2011 6:19 PM
To: Columbia River Crossing
Subject: CRC concerns

P-038-001

I have yet to see elevation drawings that show what this bridge would look like against the Vancouver skyline. Specifically, how much this tall structure will obscure views from adjacent buildings downtown. I don't mean "artist's conception" type drawings. I want to see the existing buildings drawn to scale, with the new bridge drawn in, from several vantage points. I suspect that if such drawings had been published in the Columbian, criticism would be considerable. I believe such information has been withheld for this reason: Those who stand to profit enormously from this project don't want this monstrosity to be accurately depicted. Only when it's too late will Vancouver realize what an eyesore they are stuck with.

George Bafus

P-038-001

The project has followed current guidance and methods for assessing visual impacts. The analysis is described in detail in the Visual and Aesthetics Technical Report. These methods were approved by the local, state, and federal sponsoring agencies. Though there are not many computer simulations in the FEIS, the analysis is based on not just simulations but also plan and profile drawings, photographs, view corridors and view sheds. These all contribute to understanding and considering visual impacts, and they are referenced or included in the FEIS. These methods were sufficient for the public and decision makers' consideration of the local preferred alternative and bridge type. As the project enters final design, there will be continued effort to engage the community in design and aesthetic issues. The project will be charged with maximizing the aesthetic opportunities with the composite truss bridge type. This will include developing new simulated views to inform the decisions to be made during final design.

Hines, Maurice

From: Natalie Baker [natalie.x.baker@gmail.com]
Sent: Monday, October 24, 2011 4:04 PM
To: Columbia River Crossing
Subject: Feedback on CRC

Categories: Red Category

P-039-001

You want my feedback on the CRC as a citizen of Portland? My feedback is that I understand how excited you must be about this project--indeed, that bridge would be gigantic and to some people that is the basis for considering something to be impressive--but you need to look around you: this project's legitimacy is nonexistent these days. Important non-profits, news organizations, and citizens groups have all joined to form an overwhelmingly loud voice that unitedly asks you to stop moving forward. Why continue the farce of soliciting feedback when it is blatantly obvious that you won't actually take it into consideration? What exactly do you want feedback on this far in the process? Are you just asking for feedback so that when you plunge this city into debt and a further decrease in infrastructure we actually want, you can point to the fact that you solicited feedback and claim that the CRC was built through an inclusive process? You still have a chance to take the difficult but undeniably ethical path and admit fault, slowing the process down and revisiting the legitimate concerns that have ALREADY been voiced. Don't go through with something because you've already come so far--the real costs are yet to be felt by this city, and only you have the ability to prevent them. You asked for my feedback, and I took the time to give you my thoughts. Please show me that same level of respect by legitimately considering what I (and, I anticipate, many others) have said to you, either by slowing down the process to include important stakeholders and their concerns, or by replying to my feedback with why you will not do so.

Sincerely,
Natalie Baker

P.S. Every city planner in the world knows that if you want to cut down on auto use, you have to stop accommodating it through high-speed multi-lane infrastructure. How this city can simultaneously market itself as a leader in the bicycle movement while funding a megahighway is completely beyond me.

P-039-001

Input and feedback have been carefully considered during the project's NEPA process to date. Many changes have been made based on input from citizens and other interested parties who care about the impacts as well as the benefits of the proposed project (some of the changes made are discussed in Chapter 2 of the FEIS). The process was extended to allow the Independent Review Panel and then the Bridge Expert Review Panel time to evaluate and make recommendations on many aspects of the project. These recommendations also led to project changes (summarized in Chapter 2 of the FEIS). Although Ms. Baker has suggested that we slow the process down and rethink the direction, others comment that the process has gone too slow and we should advance it much faster to construction. All input is considered. At this point, the project is advancing the selected alternative into the final design process. The speed at which it advances through design and to construction will depend on decisions by agency leadership, which are subject to citizen input.

203 West 34th Street
Vancouver WA 98660-1908
October 19, 2011

To: Whom It May Concern
RE: CRC-FEIS comments (Columbia River Crossing-Final Environmental Impact Statement)

P-040-001

I oppose the taking of the Wallis Engineering building for the south-most parking garage, as specified in the FEIS.

I served as a member of the CRC-VTAC (Vancouver Transit Advisory Committee) and alternate on the VWG (Vancouver Working Group). When the VTAC began, plans presented showed the south-most parking garage inside the SR-14 to I-5 cloverleaf, on land already off the tax rolls. Months later, the plans changed suddenly to show it on the now partly vacant "auto dealer" lot east of Columbia and south of 5th. Then, at a subsequent meeting, its footprint expanded to include the block housing Wallis Engineering. The records show one objecting comment to removing these lots from the tax rolls, but the Committee was never asked for input on this, nor were the changes fully explained. VTAC and VWG had no self-selected leadership; agendas were controlled by staff.

The Wallis Engineering building is a historic structure, and I believe it is recognized by the county and/or state as a historic building. It has served a vital function as a business incubator for many small entities, recently including Vancouver Food Cooperative. The FEIS proposal would replace this beautiful historic building paying property tax with an oversized unsightly government-owned garage.

I'd hate to have the CRC proposal or public vote opposed because of this provision; small in terms of the CRC project, but tragic in its ramifications for this now nice mini-neighborhood. Consider how ugly a block in that part of town between 5th and the River could easily be.

If the rationale is, as has been stated, to preserve hotel views when the hotel paid for no such provisions, this is improper bias in favor of one business and against others.

Sincerely,

Kenneth M. Becker

P-040-001

The process that resulted in the Lucky Lager Warehouse being identified as an anticipated acquisition was part of ongoing work between CRC, the City of Vancouver, and C-TRAN. Decisions around the Columbia Park and Ride location and the roundabout at the southwest corner of the block were part of a collaborative process similar to decision-making and design development for the rest of the project. The project development process is dynamic and includes making assumptions, gathering additional information, and sometimes changing designs or assumptions based on new information or analysis. The project will continue to minimize or avoid impacts to properties, including the Lucky Lager Warehouse.

The CRC undertook a study called the Lower Vancouver Urban Design Study with the City of Vancouver, C-TRAN and the public. The major components of this study included vehicle circulation, development opportunities and mixed-uses, pedestrian access and safety, and urban design. Expansion of the park and ride footprint resulted from an analysis of the number of spaces required at this location and the height of the structure as compared to footprint. Four options were explored that resulted in structures that varied anywhere from four to six levels. The City of Vancouver suggested the parking structure be designed with a minimal, practicable height, which requires expansion of the footprint to maintain required number of parking spaces. Additionally the expansion of the footprint had benefits to the project's other transportation modes. Further analysis of the SR 14 terminus indicated the roundabout was the appropriate design for this intersection, preferred by both the CRC and the City of Vancouver. The CRC staff analyzed multiple roundabout alternative designs in order to minimize the footprint. Through that analysis it was determined that more right-of-way was required northeast of the roundabout. The combination of the above mentioned analyses resulted in the current design and impacts.

203 West 34th Street
Vancouver WA 98660-1908
October 19, 2011

To: Whom It May Concern
RE: CRC-FEIS comments (Columbia River Crossing-Final Environmental Impact Statement)

P-040-002

I oppose the inclusion in the FEIS of a parking garage on current WA DOT land in the Lincoln neighborhood, as an alternate location. It was clear from the DEIS that this option was discarded after significant citizen opposition, and it is indeed disturbing to see it remaining in the FEISD, even as an alternative.

The DEIS is filled with many reasons for not having a garage at the Lincoln site, so citizens were unaware that continued opposition was needed to exclude it from the FEIS.

Furthermore, it now appears that VFD (Vancouver Fire Department) will need to relocate their Main Street station now near Safeway, and the WA DOT land would be an ideal location with adequate access.

Sincerely,

Kenneth M. Becker

The FEIS describes the general process for selecting the LPA in the summary on page S-9 and in Chapter 2 starting on page 2-81. The purpose of the FEIS is to disclose the impacts related to the LPA compared to no-build and the DEIS alternatives and describe what has changed since the DEIS. The FEIS does not contain a detailed description of how each design refinement was done; that level of detail is not typical for an environmental document.

Although the Lucky Lager building is listed on the Clark County Heritage Register, it has not been found eligible for the National Register of Historic Places (NRHP). Qualified staff on the CRC project and from the Esther Short Subarea planning process years before, both determined the building modifications to be too extensive for the building to be NRHP eligible. Regardless of the specifics of eligibility and associated protections, the project has attempted to avoid displacement of any building. Buildings listed on the Clark County Heritage Register are given special consideration.

P-040-002

Thank you for your comment. The LPA does not include a park and ride station in the Lincoln neighborhood.

CRC EIS COMMENTS
Todd Boulanger, PO BOX 61542, Vancouver, WA 98666

P-041-001

P-041-002

P-041-003

1. The use of 2005 traffic volumes for the bridge traffic and transit ridership, etc. is inappropriate due to the availability of more current data for a 2011 EIS.
2. The discussion of vehicle crashes (pg 3-23) for the bridge is incomplete, as it includes only motor vehicle crashes and not al vehicles (bicycles).
3. On page 3-26 the discussion is incomplete, as it misses analysis of the adjoining public parking off street.
4. The analysis and discussion of future off street parking is missing the analysis of operation and maintenance cost of the new project park & ride facilities.
5. The analysis of the first and last mile access to transit stations is in complete, as there is no comparison to bike sharing as an option vs. driving SOV, bus transfers, etc.
6. The EIS mentions that bicycle access to future LRT stations/ P+R will be facilitated along a bike route along Columbia Street (pg 3-41) , but this facility is planned but not currently signed as a bike route yet. And the planned bike lane access along Columbia Street (Vancouver TSP/ VCCV) is threatened by addition of double turn lanes from Mill Plain couplet onto Columbia.
7. The EIS (section 3) discusses ADA and pedestrian improvements along the LRT route, but the analysis/ planned improvements is missing for station to station access (east to west across Main Street between Broadway to Washington or north to south on the other sections).
8. The discussion of future bike pedestrian access along/ across Fourth Plain to the north/south road to the Clark P+R (pg 3-42) is missing the proposed bike pedestrian facility from the Rose Village neighborhood along K Street dead end south of 26th St (west side of military graveyard), as discussed by the PBAC.
9. The discussion of future bike pedestrian access along/ across Fourth Plain to the new road to the Clark P+R (pg 3-42) is missing the proposed bike pedestrian facility from the Arnada neighborhood along G, H, & I Streets dead end, as discussed by the PBAC.
10. The discussion (pg 3-42) of future bike pedestrian access to future CRC built facilities (P+R, etc.), is missing the links to the SR500/ Leverich Park/ Discovery Middle School, as discussed by the PBAC.
11. The EIS content (Exhibit 3.1-26)) reporting planned/ proposed CRC bicycle pedestrian facility network to LRT stations in Vancouver is not equitable to that concerning the Portland jurisdiction, especially Hayden Island, given the PBAC input.
12. Page 3-50 analysis misses the option of the CRC project utilizing existing underutilized off street parking structure spaces (Vancouver Centre, etc.) vs. only discussing the hared use of future CRC stalls. The use of existing parking stalls (excess capacity) for the P+R could reduce the construction costs and minimize the loss of historical buildings along Columbia. The Vancouver Centre parking structure was enlarged to over 800 stalls vs. the smaller original structure and the 4th building has not been built nor is it likely to be built.
13. The discussion (pg 3-51) of the of the construction/ workzone impact mitigations does not go into enough detail, especially given the tools used during the Yellow Line construction.

P-041-001

The traffic volume cited in the FEIS (134,000 vehicles per day) was from a specific count conducted in October 2005 when all ramps and the mainline volumes were obtained simultaneously. The day in October 2005, which needed to be selected in advance for the major traffic counting effort, was within one percent of the average weekday traffic volume for the entire year (2005). Traffic volumes fluctuate and did decrease during some years. Traffic volumes obtained from the Oregon Department of Transportation's automatic traffic recorder (ATR) monitoring sites show that traffic volumes have, in fact, been increasing in the last few years. Whether the traffic volumes forecast for year 2030 will actually be achieved in that year should not be the only consideration. In its July 27, 2010 report, the Independent Review Panel expressed concerns about a longer horizon. The IRP commented, "The desirability of living in the Portland/Vancouver region is not going to diminish, so populations will continue to grow…. [T]he IRP believes the greatest risk in the decision-making process is not over-sizing the bridges but not building enough capacity for the next 100 years."

P-041-002

The section of the FEIS discusses vehicle crashes. Page 3-16 of the FEIS mentions the safety problems faced by bicyclists and pedestrians on the bridge.

P-041-003

Analysis of parking facilities will progress following the Record of Decision. There will be more specific assessment of the traffic and bike impacts at each site. The previous analyses have been more than sufficient to enable decision-making appropriate to the planning level of design. The project does not intend to utilize space in existing parking facilities as these have been constructed for other purposes, are not FTA facilities, and will presumably be more heavily utilized, consistent with the design projections which led to their sizing.

CRC EIS COMMENTS
Todd Boulanger, PO BOX 61542, Vancouver, WA 98666

P-041-003

14. Clarify the total effect of the Mill Plain lane closures (pg 3-51), as the text mentions a second turn lane onto Columbia, but this would effect important regional bicycle access to P+R stations (first and last mile).
15. There is no discussion of the work zone mitigations for continued bike lane access (pg 3-61).
16. Pgs 3-62 & 63 include an incomplete analysis of the mitigations for bike and pedestrian access due to parking.
17. There is inadequate discussion of the work zone/ closure mitigations developed during the bridge trunion repair project (Amtrak commuter rail, etc.) (pg 3-66).
18. The report analysis misses discussion of adding bikestation facilities to transit hubs in Vancouver and Hayden Island for the first and last mile access to LRT stations.
19. The EIS does not discuss why the minimum parking stall totals were increased between options and from the DEIS, thus enlarging the property takes.

You have asked about some very specific bike and pedestrian connections. The following details should answer your questions:

- The path between Rose Village and Fourth Plain, and the path between Fourth Plain and McLoughlin are planned project elements.
- The most direct route for the Arnada neighborhood to the proposed station on McLoughlin would be by way of G, H and I Streets directly to McLoughlin.
- No improvements are proposed on 39th Street in the LPA. A future project would complete the interchange at SR 500 by adding the ramps to and from the north, and would include improvements to 39th Street and allow the connections referenced to be made.

Hines, Maurice

From: Sharon Boyle [smboyle518@comcast.net]
Sent: Monday, October 24, 2011 7:38 PM
To: Columbia River Crossing
Subject: FEIS

P-042-001

What happens when The City initiative is presented on the ballot - with no City monies or employee support of the LPA is allowed?

P-042-001

The project is not aware of such an initiative and would need more information to respond. The Cities of Vancouver and Portland coordinate closely with CRC staff, though neither City is responsible for funding the project.

Ted Buehler
105 NE Beech St
Portland OR 97212
503-890-0510

24 October 2011

Comments: CRC EIS

1) **Environmental Justice:**

P-043-001 Section 3.5.5. There is no discussion of the increased congestion on I-5, primarily southbound, though inner N and NE Portland. The Boise, Humboldt, Concordia and Kenton neighborhoods have high poverty and high minority populations. Increasing air pollution through increased gridlock in these neighborhoods should be addressed. Also, increased traffic on Greeley, Denver, Interstate, Vancouver/ Williams and MLK should be addressed, as traffic will divert off I-5 from downtown to the Columbia River to avoid gridlock on I-5.

2) **Bicycle Mitigation during construction**

P-043-002 Page 3-61 should include facility improvements during construction to offset the degradation of the route during construction. This could include pavement improvements, wayfinding improvements, pavement widening, and other things to bring the current route up to ODOT and AASHTO standards during the construction process.

3) **Spillover traffic incorrectly counted as "leaving the I-5 corridor**

P-043-003 Page 3-11 shows 35% of the I-5 bridge traffic leaving the project corridor on the Oregon side of the river. Anyone who has ever observed traffic backing up on N Interstate or N MLK knows that drivers use surface streets to avoid I-5 congestion through North Portland. This graphic should be corrected after data is collected pertaining to how much of the traffic that "leaves" is actually going to or from downtown Portland.

4) **No accounting of increased bicycle travel time with circuitous route**

P-043-004 Page 2-34 shows the bicycle route taking a 4-block long, 360 degree loop to get from the bridge deck to downtown Vancouver. This creates an unjust delay to bicycles relative to cars. They are forced to travel down to the riverbank in a big circle while cars travel directly through past downtown Vancouver. The bike route needs a second "exit" from the bridge facility to Fort Vancouver, at the "Community Connector" feature. This would shorten travel time from most points in Vancouver into Portland by 8 minutes over the current design.

Any civil engineer knows that routes should be designed to be direct. This "loop" will create a permanent penalty of time and energy for every bicycle trip across the river, compared to the equivalent car route. Bicycles should not be penalized for their mode choice with longer, hillier routes.

An analysis should be done comparing the bicycle route to the car route through the project area. The bicycle route should be comparable in terms of distance and topography.

5) **No giant parking garages**

P-043-005 Exhibit 2-2-19 shows three mammoth parking garages. At 400 spaces each, these will cost over a million dollars each to build. How about eliminating these garages, developing the land with mixed

P-043-001

Neither the CRC project nor the Delta Park projects are intended to address the southbound traffic congestion that currently exists near the I-5/I-405 split. However, traffic analyses show the congestion at the split will not be worsened because of the Columbia River Crossing project. The main reason is that fewer cars are expected to cross the river with a project in 2030 than without a project. This is due to the provision of improved transit service and tolling. Furthermore, because the Interstate will provide better mobility with the LPA, cut-through traffic on parallel neighborhood streets will be reduced.

P-043-002

In Section 3.1 of the FEIS, and in the Record of Decision, the project has identified a number of construction-period mitigations for bike facilities. As the project designs are advanced, these mitigations will also advance. The project and construction contractors will work with the community to provide suitable improvements and will refine these throughout the various stages of construction.

P-043-003

The data used in the analysis show that much of the exiting traffic has destinations within the subareas where the exits are. Many of these vehicles are, therefore, actually only using and only needing to use the Interstate for short trips. The Traffic Technical Report provides more details regarding these commute patterns. The project does recognize that many motorists exit the Interstate and use parallel routes in order to avoid the congestion on the Interstate. Many of these trips will return to the Interstate when congestion is relieved.

P-043-005 Use TODs, and using the dollar saved to extant MAX to Clark College and through to the high-density neighborhoods along Fourth Plain and 18th Aves in Vancouver?

6) **Unrealistic assessment of northbound commute benefits**

P-043-006 Exhibits on page 3-153 shows a penalty to southbound Portland commuters for bridge construction. Traffic congestion (caused by Washington State Commuters) is simply shifted from downtown Vancouver to North Portland. But the northbound traffic shows no gridlock anywhere. This is suspect, as there is an equal amount of northbound traffic. It seems that it will be backed up in downtown Portland -- the delays will be on the Morrison Bridge and other I-5 on-ramps. These should be shown in the study.

7) **Bicycle Facilities in the proposal are not "World Class"**

P-043-007 Appendix F
Portland and Metro's endorsements (Portland Resolution No. 36618, July 9, 2008, and Metro's Resolution No. 08-3960B) both call for *World Class Bicycle Facilities* and for bicycle facility improvements *throughout the project area.*

Specifically, Portland calls for
FB 1. "The facility should meet or exceed standards set by "World-Class Facilities."

and Metro calls for
"The project should design "world class" bicycle facilities on the replacement bridge, bridge approaches, and throughout the bridge influence area that meet or exceed standards..."

The Bicycle and Pedestrian Committee did extensive research on their own time to identify what characterizes "World Class" facilities. They presented the material to the Project Sponsors Council, and their recommendations were systematically rejected. The main span is acceptable, but not world class. The approaches are poor, forcing bicycles to wander through all sorts of twists and turns, stopping and starting, and much out-of-direction travel. The facilities in the EIS are decidedly NOT "world class" when compared with the standards developed by PBAC.

Nor do they extend through the bridge influence area. There are no improvements south of Marine Drive in Portland or north of 7th St. in Vancouver. This is far short of the bridge influence area, and leaves bicyclists on outdated, dangerous, third-rate facilities in both Portland and Vancouver while they ride through the project influence area.

The CRC should follow these directives from Portland and Metro and upgrade the planned bicycle facilities.

P-043-004

The project has worked to shorten the bike pathways as much as possible while also keeping the grades (inclines) to a reasonable level and within established standards. Although the landing in Vancouver will require a loop ramp, the existing facility (west of I-5) currently relies on a long loop. The current east side loop, though smaller, requires sharp turns through a driveway and parking lot.

The idea of bringing a multi-use path all the way to the connector has been studied. A bike path from the River Crossing Bridge to the Community Connector will not be built due to geometric constraints through the SR 14 interchange. Standard vertical clearances under and over SR 14 ramps must be achieved and a 5% maximum path running grade is required for ADA compliance. A path through the SR 14 interchange would require excessively steep grades of 10-30%. Additionally, such a path would face complexities at the BNSF overcrossing, potentially enter into the Pearson Airspace and would impact Section 4(f)-protected properties to the east.

Also, the Reserve will be more accessible by bike since Apple Tree Park will be accessible from Main Street.

P-043-005

Decisions over the location and number of parking spaces provided at park and rides were designed to maximize ridership on light rail transit and are not expected to be eliminated. As described in the Indirect Effects Technical Report, transit-oriented development is predicted around transit stations and near the park and rides.

P-043-006

Although the specific reference could not be located, Mr. Buehler's point appears to be clear. The northbound commute will experience less congestion with the LPA, because the major bottleneck at the bridge will

be improved. In the southbound direction, however, there remains a congested bottleneck condition at the Rose Quarter. The LPA will reduce the number of cars entering the Rose Quarter from the north, but an improvement at that location will likely still be needed in the future, regardless of the CRC project outcomes.

P-043-007

As discussed in the DEIS and FEIS, a replacement bridge over the Columbia River will include dramatically improved bicycle and pedestrian facilities by providing:

- A new 16- to 20-foot multi-use pathway over the Columbia River completely separated from vehicle traffic due to the design of the Stacked Transit Highway Bridge;
- Protections from traffic noise, exhaust, and debris for pedestrians and bicyclists on the river crossing;
- More direct connections on each side of the river, consisting of stairs, ramps, and elevators, as well as pathway extensions that connect in with existing or planned facilities and public transit;
- Many new or enhanced sidewalks, bike lanes, and crosswalks near the bridge and throughout the project area.

Since the publication of the DEIS in May 2008, and the selection of the LPA in July 2008, the CRC project team has continued to work with the Pedestrian and Bicycle Advisory Committee and project partners to refine route and facility design. The updated design, as described in Chapter 2 (Section 2.2) of the FEIS, is the outcome of a long collaborative process.

From: Ron Buel [mailto:ronb@donavoncards.com]
Sent: Monday, September 19, 2011 12:23 PM
To: Columbia River Crossing
Cc: 'Nigel Jaquiss'; 'Jeff Manning'; sduin@oregonian.com; smirk@portlandmercury.com; Collette, Carlotta; carlhosticka@metrocouncil.or.us; Joe Cortright; bobstacey@mac.com; Shirley.craddick@oregonmetro.gov; mara@clfuture.org; jimhowell89@hotmail.com; fredtrain@aol.com; Chris Smith; Joe Smith; sharonnasset@aol.com; PerkinsRealty@comcast.net; 'Rep EyreBrewer'; Rep.mitchgreenlick@state.or.us
Subject: FW: [Bridgeteam] CRC's Final Environmental Impact Study

Dear Columbia River Crossing Feedback:

P-044-001 I read more than 200 pages of submitted testimony raising, as Fred Nussbaum says below, substantive comments about the faulty assumptions, analysis and conclusions in the DEIS. I can find **no** response to any of these questions and comments in the FEIS, nor have there been any truly substantive changes in the FEIS from the DEIS on the subjects we commented upon. None of the people who submitted this testimony in writing have ever been contacted by the CRC. Please explain why you have not responded to those of us who testified in writing, spending hours on our efforts. Please explain why there is **no** response to our testimony in the FEIS. Doesn't this make a mockery of the citizen participation process on the Columbia River Crossing?

Ronald A. Buel, 2817 NE 19th Ave., Portland, OR 97212 -- 503-358-8677

From: bridgeteam-bounces@smarterbridge.org [mailto:bridgeteam-bounces@smarterbridge.org] On Behalf Of
fredtrain@aol.com
Sent: Saturday, September 17, 2011 8:26 PM
To: feedback@columbiarivercrossing.org
Subject: Re: [Bridgeteam] CRC's Final Environmental Impact Study

P-044-002 Excuse me. The FEIS isn't only supposed to be another propaganda piece. It's supposed to answer all the comments received on the DEIS. You got a lot of substantive comments about the faulty assumptions, analysis and conclusions in the DEIS and documents leading up to it. Some comments were quite extensive in their scrutiny and suggestions of alternatives.

Fred Nussbaum
6510 SW Barnes Road
Portland, OR 97225
503.292.5549

P-044-001

The FEIS provides a summary of public input, responses to every letter submitted on the DEIS (Appendix P), and a summary of project changes that have occured based on public input (Section 6.4).

P-044-002

Please see the response above.

-----Original Message-----
From: Columbia River Crossing Project <feedback@columbiarivercrossing.org>
To: FredTrain <FredTrain@aol.com>
Sent: Thu, Sep 15, 2011 9:17 pm
Subject: CRC's Final Environmental Impact Study

You're Invited

to learn about plans to address safety and traffic problems on I-5.

Publication of the Columbia River Crossing (CRC) Final Environmental Impact Statement (EIS) brings the project closer to completing the planning phase. The Final EIS contains analyses of the project's potential environmental and community effects. It also describes how a replacement Interstate Bridge, light rail and other project elements will improve safety and relieve congestion.

Drop-In Information Sessions

Wednesday, October 12, 2011
2 – 4 p.m. and **6 – 8 p.m.**
Vancouver Community Library
901 C Street, Vancouver, WA 98660

Thursday, October 13, 2011
2 – 4 p.m. and **6 – 8 p.m.**
Jantzen Beach SuperCenter Community Room
1405 Jantzen Beach Center, Portland, OR 97217

PLAN YOUR TRIP: www.trimet.org or www.c-tran.com

For more information about the FEIS drop-in information sessions please visit our website.

Direct questions or comments tofeedback@columbiarivercrossing.org

Hines, Maurice

From: Ron Buel [ronb@donavoncards.com]
Sent: Monday, October 24, 2011 2:52 PM
To: Columbia River Crossing
Cc: Joe Cortright; mara@clfuture.org; 'Jeff Manning'
Subject: Completely inadequate FEIS for CRC

Dear CRC:

P-045-001

As testimony on the CRC DEIS, Joe Cortright and I submitted a long paper about land-use in Clark County - the 5,000 acres of un-developed farmland in Clark County that is currently zoned for housing. The FEIS, like the DEIS, says there will be 30 years of static land-use - no growth in Clark County. This implies that a new freeway bridge would not make any difference to the rate of development in Clark County in the future. This is not a believable assumption. A new freeway bridge will bring new development, and therefore increased travel across the Columbia on I-5, within the 30 year period covered by the FEIS. Clark County and Vancouver planners assume population growth rates through 2030 - such population increases will be stimulated by perceptions that a new bridge will make travel easier and less congested, and you have not accounted for such growth in automobile travel across the Columbia caused by a new bridge. Nor do your air pollution figures, nor your carbon dioxide projections account for such induced travel.

It is also unrealistic to assume that light rail transit will carry 37% of trips in 2030 or 2035. This is far too high, since people will still have to get in their cars to drive to the park-and-ride garages near the light rail stations, and the trip on the Yellow Line has nine stops between Hayden Island and Portland's central city. Time savings on light rail will not be that great, compared to the automobile, especially if you are adding more freeway capacity. These light rail ridership figures are simply not realistic. Therefore, you have further under-estimated the travel on light rail.

Further, Stantec told Oregon State Treasurer Ted Wheeler that the Metro travel models used by the CRC are not capable of predicting what percentage of trips will use the I-205 Glenn Jackson Bridge instead of paying a toll to use the CRC. Therefore your projectios of what the un-tolled Glenn Jackson usage will be, when compared to toll rates on the CRC that are not yet final, has not been accurately assessed by your FEIS. Nor can you accurately assume what impact such route-changing will have on congestion on I-205, and the resulting impacts on air pollution and carbon from such switching of routes by commuters are similarly rendered inaccurate by this problem.

Your FEIS does not attempt to assess impacts on parallel arterials to I-5, nor on travel on arterials to and from entrances (and exits) on I-5. This is particularly troublesome because this means that you have not accurately assessed net effects on air pollution and greenhouse gas emissions in the nearby neighborhoods from CRC travel. Your work has only assessed the impacts on I-5 within the bridge impact area, leaving you making predictions of air pollution and carbon that cannot, therefore, be accurate on a net basis.

You have not accurately assessed the congestion impacts at Victory Blvd. or Delta Park, when the seven lanes going South coming off Hayden Island and Marine Drive South narrow to three lanes at Victory Blvd. This junction is

1

P-045-001

As described in Chapter 3 (Section 3.4) of the DEIS and FEIS, and in the Indirect Effects Technical Report, highway capacity improvements and access improvements can induce development in suburban and rural areas that were not previously served, or were greatly underserved, by highway access. The DEIS outlines a comprehensive analysis of the potential induced growth effects that could be expected from the CRC project. A review of national research on induced growth indicates that there are six factors that tend to be associated with highway projects that induce sprawl. These are discussed in the Indirect Effects Technical Report. Based on the CRC project team's comparison of those national research findings to CRC's travel demand modeling, Metro's 2001 land use / transportation modeling, and a review of Clark County, City of Vancouver, City of Portland and Metro land use planning and growth management regulations, the DEIS and the FEIS conclude that the likelihood of substantial induced sprawl from the CRC project is very low. In fact, the CRC project will likely support the region's goals of concentrating development in regional centers, reinforcing existing corridors, and promoting transit and pedestrian friendly development and development patterns. The region's goals are reinforced by the project's location in an already urbanized area, the inclusion of new tolls that manage demand, the inclusion of new light rail, and the active regulation of growth management in the region.

In October 2008, the project convened a panel of national experts to review the travel demand model methodology and conclusions, including a land use evaluation. The panel unanimously concluded that CRC's methods and conclusions were valid and reasonable. Specifically, the panel noted that CRC would "have a low impact to induce growth… because the project is located in a mature urban area," and that it would "contribute to a better jobs housing balance in Clark County… a positive outcome of the project". These results are summarized in the "Columbia

P-045-001 going to be at 99% of capacity, stopping traffic and backing it up onto the bridge during every morning commute. As a result, projected improvements in peak Southbound congestion will not materialize from construction of the CRC. This also has air pollution, air toxic and greenhouse gas ramifications - they will be much worse than you projected for the CRC.

You have built a strawman of a No-build which vastly over-states the congestion that will occur in the traffic modeling years of 2030 and 2035 if there are no changes to the existing I-5 bridges. Traffic has been declining on the I-5 bridges over the last decade, especially in response to the increase in gasoline prices which, across the nation, is causing people to drive less. You make your CRC projections look better when compared to this unrealistic No-build strawman. You under-state the congestion that will occur with the CRC (and on the Glenn Jackson Bridge) while vastly over-stating traffic and congestion (and air pollution and carbon) from the No-build outcome.

P-045-002 I do not see in the FEIS projections of impact of construction (nor length of the in-water work window) on endangered salmon runs in the Columbia. The newest bridge design will also have more pillars near the shore, which will also have negative impacts after construction to the salmon run that have not been calculated in the FEIS. Net, net, you have not realistically projected the impact on salmon runs from construction and a completed bridge.

P-045-003 I do not see in the FEIS the impacts fairly assessed on the more than 20 historic sites near the project.

P-045-004 I do not see numbers on losses of jobs from the closing of 39 businesses (approximately 600 jobs) on Hayden Island and 50 businesses in Vancouver.

P-045-005 I do not see assessments of the economic impacts of disruption on businesses not taken by the CRC, from the seven years of construction of the CRC project.

Cordially,

Ronald A. Buel
2817 NE 19th Ave.
Portland, OR 97212

River Crossing Travel Demand Model Review Report" (November 25, 2008).

In 2010, Metro ran the MetroScope model (an integrated land use and transportation model) to forecast growth associated with transportation improvements of a 12-lane river crossing and light rail to Clark College. Even with a 12-lane river crossing, the model showed only minimal changes in employment location and housing demand compared to the No-Build Alternative.

For a more detailed discussion regarding potential indirect land use changes as a result of the CRC project, including the likely land use changes associated with the introduction of light rail, please see Chapter 3 (Section 3.4) of the FEIS. By 2030, the region's population is expected to increase by one million people. This increase will result in more people needing to travel between home, work, school, recreation, etc. In 2005, 135,000 vehicles crossed the Columbia River on the Interstate Bridge, which led to 4-6 hours of congestion each weekday. By 2030, 184,000 are predicted to cross the river, which would lead to 15 hours of daily congestion if no action is taken.

Congestion occurs when vehicle demand is greater than a transportation system's capacity. It results in slower speeds and increased travel times. CRC defines congestion as vehicles traveling less than 30 mph. The Columbia River Crossing project uses information gathered from Metro's nationally-recognized travel demand models to determine the project's effect on congestion. These models predict trip frequency, types or modes of transportation, destination, and time of day. Transportation planners use these models to analyze the effects of such factors as increased population and employment, transportation improvements, and new developments on the transportation system.

Traffic volumes fluctuate and did decrease during some years. Traffic

volumes obtained from the Oregon Department of Transportation's automatic traffic recorder (ATR) monitoring sites show that traffic volumes have, in fact, been increasing in the last few years. Whether the traffic volumes forecast for year 2030 will actually be achieved in that year should not be the only consideration. In its July 27, 2010, report, the Independent Review Panel expressed concerns about a longer horizon. The IRP commented "The desirability of living in the Portland/Vancouver region is not going to diminish, so populations will continue to grow…. [T]he IRP believes the greatest risk in the decision-making process is not over-sizing the bridges but not building enough capacity for the next 100 years."

Based on the Metro model's past ability to predict transportation effects, the CRC project is confident in the data received from Metro and uses it to determine what impact the project will have on congestion. The improvements proposed by the project to the highway and seven interchanges will help better accommodate increased future vehicle traffic. New auxiliary lanes and longer on/off ramps will allow safer and more efficient merging and weaving to enter or exit the freeway. Narrow lanes and shoulders will be widened to current standards. Shoulders will be added where they are currently missing. All of these changes will improve the flow of traffic in the bottleneck area of the Interstate Bridge.

The air quality evaluation presented in the DEIS assessed how emissions would be expected to change by 2030 and how the project would affect emissions of pollutants regulated by state and federal standards as well as vehicle emissions that are not regulated. Oregon and Washington, as well as the federal government, have established ambient air quality standards for criteria pollutants. These standards are based on human health risks. The DEIS evaluation included an analysis demonstrating that the CRC project would allow the region to retain conformity with state and federal air quality standards for relevant criteria pollutants. See the Air Quality Technical Report for a detailed

explanation of the state and federal regulations concerning air quality and the evaluation of how the project complies with relevant air quality regulations. See Section 3.10 of the FEIS for an updated explanation of the pollutants regulated by state and federal law.

The DEIS also evaluated how the project alternatives would affect emissions of mobile source air toxins (MSATs) from I-5 traffic. MSAT emissions from vehicles are not currently regulated. The evaluation in the DEIS found "that future (no-build or build) emissions of all pollutants would be substantially lower than existing emissions for the region and the subareas" (page 3-277). These reductions in emissions are largely the result of on-going reductions in vehicle emissions that will occur with or without the project, and are based on standard assumptions regarding future vehicles and fuel. The anticipated vehicle emission reductions are based largely on regulation-driven improvements in fleet fuel efficiency standards and cleaner gasoline and diesel fuels. Any extraordinary improvements in fleet fuel efficiency or fuels would result in even greater emission reductions. Projected reductions in vehicle fleet emissions would result in a 25% to 90% reduction in I-5 related criteria pollutant emissions over existing conditions, even with the anticipated growth in population, employment and VMT. In addition, the build alternatives would provide small further reductions in vehicle emissions at the regional level and for most pollutants in each of the subareas along I-5. CO and NOx emissions would be slightly higher with the project than with No-Build (but still lower than existing conditions) in the I-5 subarea between the SR 14 and SR 500 interchanges, as discussed in DEIS Chapter 3 (Section 3.10) and FEIS Chapter 3 (Section 3.10). The updated analysis conducted for the FEIS resulted in very similar findings to those in the DEIS.

P-045-002

Page 3-393 in Section 3.16 of the FEIS document provides discussion on the in-water timing of any necessary dredging and cofferdam

placement (November 1 through February 28) and in-water impact pile driving (September 15 through April 15). This page also summarizes the likely impacts to ESA-listed salmonids and eulachon from impact pile driving which was identified as the largest impact to aquatic systems of the project. Total shading from project construction is discussed on page 3-394. Exhibit 3.16-9 provides a summary of project elements' effects on ESA-listed species. Other activities are proposed to occur year-round as discussed in the Ecosystems Technical Report. Exhibit 5-1 in the Ecosystems Technical Report presents a proposed sequencing of in-water structure construction.

The LPA will not have an increased number of piers or pillars near the shore compared to that addressed in the DEIS or during ESA consultation. Removal of the existing bridge after construction of a new bridge will result in an increase in shallow water in the Columbia River and a loss in North Portland Harbor. Quantification of shallow water impacts are discussed on pages 3-390 and 3-391 of the FEIS.

Much more detailed analysis on short-term and long-term effects on listed and other native aquatic organisms is provided in Sections 4 and 5 of the Ecosystems Technical Report. Analyses in the technical report address near-shore and shallow-water effects from temporary structures and shallow-water structures, cofferdams, piers and shafts, shading, etc.

P-045-003

Section 3.8 of the FEIS provides details about each impact. The Archaeology and Historic Built Environment Technical Reports also provide additional information.

P-045-004

Section 3.4 of the FEIS and the Economics Technical Report describe the impacts to local jobs associated with displacements.

P-045-005

The impact of construction activities on businesses is considered in the FEIS. Please see discussions in Section 3.4 (Land Use and Economic Activity), specifically the subsections on Temporary Effects and Mitigation.

Hines, Maurice

From: Bob Clark [elvsy3k@yahoo.com]
Sent: Friday, October 21, 2011 9:43 PM
To: Columbia River Crossing
Subject: Public comment

To whom it may concern:

P-046-001 **I recommend the light rail portion of the Columbia River Crossing Project (CRC) be eliminated in its entirety. My key objections are the link to the existing north portland light rail line is not a practical method for transporting the many bus riders going between Vancouver and central Portland (especially downtown Portland). The existing North Portland light rail commuter line is too slow and has too many stops requiring way too much time for the many folks traveling between these two points currently using the C-Tran bus service. Secondarily, the cost of the light rail portion of CRC is too much considering the small fraction light rail would represent of total trips by all modes.**

Bottom line: Proceed with project but without its light rail component. Keep the C-tran service as is.

P-046-001

Light rail has been endorsed by every local Sponsoring Agency (Vancouver City Council, C-TRAN, RTC, Portland City Council, TriMet, and Metro), whose boards include elected officials from throughout the area.

Annual light rail passenger trips crossing the I-5 bridge in 2030 are projected to be 6.1 million, with daily ridership around 18,700. The travel time for the morning commute by light rail between downtown Vancouver and Pioneer Square in downtown Portland will be approximately 34 minutes. Light rail would travel on a dedicated right-of-way, with more reliable travel times than auto drivers dealing with unpredictable road conditions, traffic congestion, and parking challenges.

The CRC project planning for light rail incorporates and supports the principles of the Vancouver's City Center Vision Plan. Downtown Vancouver has seen recent growth in higher density mixed use projects from three to 12 stories in height. In addition, another 4,000 downtown condominiums are proposed or pending as part of new developments. The core of Vancouver has, along with many of the larger corridors such as Fourth Plain Blvd, medium to high density residential development and an urban mix of uses. Transit demand in these areas is quite high, and ridership will increase with the introduction of light rail.

Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on having a public vote.

Hines, Maurice

From: jcortright [jcortright@gmail.com]
Sent: Monday, October 24, 2011 1:37 PM
To: Columbia River Crossing
Subject: Comments on FEIS
Attachments: Cortright_FEIS_Comments_24Oct2011.pdf; FHWA_NEPA_Guidance.pdf; NEPA Planning Requirements 2-9-11-1.docx; RE_ BRP recommendations and NEPA w attachment.pdf; RE_ FTA_FHWA re-eval checklist.pdf; Williams_Derry_2011_DisappearingCars.pdf; Williams_Derry_2011 _WashingtonVMT.pdf; Williams_Derry_WSDOT vs. Reality 2011.pdf; Williams-Derry 2011 Multnomah County _ Sightline Daily.pdf

P-047-001

Please accept the following letter and attachments as comments on the Final Environmental Impact Statement for the Columbia River Crossing.

Please confirm receipt of this correspondence at your earliest convenience.

Joseph Cortright
1424 NE Knott Street
Portland, OR 97212

503.515.4524

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

P-047-001

This introduction in Mr. Cortright's letter provides a brief summary of a few of the detailed concerns that he expresses in the body of his letter. Please see below for responses to each of his detailed comments that are noted in this introduction.

IMPRESA
ECONOMICS

October 24, 2011

Columbia River Crossing
c/o Heather Wills
CRC Environmental Manager
700 Washington Street, Suite 300
Vancouver, WA 98660

RE: Columbia River Crossing Final Environmental Impact Statement

Dear Ms. Wills:

P-047-001

I submit the following written comments for consideration as the US Department of Transportation reviews the Final Environmental Impact Statement for the proposed Columbia River Crossing.

The Final Environmental Impact Statement (FEIS) fails substantially to meet the requirements of the National Environmental Policy Act (NEPA), and therefore you, and your subordinates at the Federal Highway Administration and Federal Transit Administration, should decline to enter into a Record of Decision, and should instead undertake additional analysis to comply with NEPA.

The FEIS does not disclose either the true nature of the project as it is likely to be built, nor does it accurately disclose the impacts of this project on the region. I have several comments in the text of this letter, but I will highlight three in particular:

1. You do not know what portions of the project will be built, and as a result cannot accurately assess its impacts, because project funding has not been determined, and the project will be broken into phases, and there is no assurance that discrete phases of this project will have the effects presented here.
2. CRC traffic forecasts are wrong, the traffic models used to produce them have been acknowledged by their authors to be incapable of accurately forecasting traffic on tolled facilities, and traffic projections have not been revised since the DEIS to correct acknowledged errors and changes in conditions.
3. The FEIS fails to present any current or historical information on actual traffic levels on the I-5 bridges. Traffic volumes are significantly lower than represented in the FEIS, and are declining, not increasing.

Approval of the Final Environmental Impact Statement is a momentous responsibility: the Department of Transportation's obligation to certify to the citizens of the region and

P-047-001

the nation that it has fully analyzed, disclosed and considered the project's impact on the region's transportation system, its environment, and the region's communities and people. You have an important duty to assure that this information is accurate, complete and fair.

My analysis shows that the FEIS presents an incomplete, inaccurate and deceptive view of the project's impacts, and therefore US DOT ought to postpone proceeding further with this project until the information in the FEIS is corrected.

1. CRC project financing is highly uncertain, making it impossible to know what will actually be built and therefore what will be the actual environmental, social and land use impacts

P-047-002

In order to assess the impacts of the project, you have to know what the project is. It is clear from the record that the scale of the project will be adjusted to fit available financing. But as yet, the project's financing is simply conjectural: none of the sources of funding (federal highway earmarks, FTA transit funding, Oregon and Washington gas tax increases, tolls, and a CTRAN sales tax) have been committed to the project. The Governors have directed that the project be phased, and the CRC has indicated that it is planning to break the project into phases, but as yet, no meaningful action has been taken.

It is apparent from the staff report that the financial plan for the CRC is completely unresolved at this point. We have no idea what kind of project will actually be built, so we have no way of accurately assessing its impacts.

The CRC depends on a complex, multi-part financing plan. None of the parts of the plan have yet been approved by any of the bodies that must approve such funding. There are four key elements to this financing plan: toll bonds, Oregon and Washington appropriations, federal New Starts funding, and federal highway funding.

The CRC financing plan rests on seven key assumptions about decisions that will be made and amounts that will be provided for project funding:

1. Washington legislative approval of facility tolling.
2. Washington legislative approval of funding for the state share of the project.
3. Oregon legislative approval of funding for the state share of the project.
4. Earmarking or Federal Highway Administration approval of funding for the highway portion of the project.
5. Federal Transit Administration approval of New Starts Funding

P-047-002

It is common practice on large public proposals to secure the funds to construct the project after the NEPA phase is complete. In fact, to commit certain types of funds prior to issuing the ROD would violate federal law. Some types of federal funding commitments are considered "federal actions" and therefore cannot be made until after the ROD is issued.

Regarding phasing, the FEIS evaluates the full impacts of the entire project and evaluates how those impacts may differ if three elements were to be constructed at some later date. This is described on page 2-86 of the FEIS and the likely impacts are discussed in each section of Chapter 3 and in Chapter 5. As the FEIS notes (page 2-4), a wide range of possible cash flow scenarios and construction phasing scenarios are possible. Phasing a project can change the timing of impacts but does not generally make a significant difference in the character or magnitude of impacts. Prior to the ROD, it is not possible to know how much funding the project will receive or when it will receive it and therefore it is also not possible to know how it will be phased. Following the ROD, as commitments to funding are secured and the timing of funding becomes known, the effect of phasing or sequencing can be reviewed to determine if it would change the existing NEPA evaluation of environmental impacts and/or mitigation in a meaningful way. Any changes could be assessed through a NEPA re-evaluation, as appropriate, and a determination would be made at that time if any additional NEPA review would be needed.

This is consistent with NEPA and with Transportation Planning requirements. As described in an FHWA Guidance Memorandum[1], a major project that does not identify project phases in the ROD can decide at a later date to construct the major project in phases.

[1] This is from Question and Answer #28 of the 2/9/2011 Supplement to

the “January 28, 2008 Transportation Planning Requirements and their Relationship to NEPA Process Completion Distribution Memo”.

P-047-002

6. Oregon and Washington Treasurers' approvals for the authorization of toll-backed revenue bonds
7. Voter approval in the CTRAN district or a portion thereof of operating funds for light rail.

In order to construct the project as currently described by the Project Sponsors Council, all of these financial approvals must be made, and made at the full amount budgeted. If any of these sources of funds or approvals is not made, or if funding is provided at less than the budgeted amount or if funding or approval is delayed, there is no assurance that all of the component parts of the project will be constructed.

There are major risks that one or several of these assumptions are incorrect and that expected sources of funding will not materialize, and additional risks that they will not materialize in the amounts budgeted or on the schedule currently planned.

In addition, it now seems certain that the project will need to be broken into a series of separate phases. The timing and the ultimate scope of the Columbia River Crossing project will depend upon the amount of funds received for project construction. There is no assurance at this time that any given component of the project will be completed.

At the present time, it is highly likely that funding will not be available to construct the entire project as described. Acknowledging this fact, on July 20 of this year, Governor John Kitzhaber directed CRC to develop a “sequencing” plan for the project (Kitzhaber 2011):

> The Treasurer also identified potential replacement revenue strategies, which I appreciate and am willing to explore. But I believe that if we are going to get the CRC done, it is time to start planning for a project that adapts to the available resources and fits into today’s economic reality. To that end, I am going to ask the Oregon Department of Transportation and the CRC to prepare a sequencing plan that accommodates anticipated cash flow.
> (Kitzhaber 2011)

The need to sequence or phase the project to fit available funding is likely to result in major changes to the project's scope, timing and ultimate impacts. More than a year ago, the Independent Review Panel appointed by then-Governor Kulongoski and Governor Gregoire concluded that the project would need to be broken into phases because of the low likelihood of all of the projected funding materializing. The IRP recommended the project be broken into three phases each of 1 to $1.5 billion (Independent Review Panel 2010, page 186). The IRP is particularly significant because the Directors of the Oregon and Washington Department’s of Transportation both said that they accepted the report and agreed to implement its findings (Garrett and Hammond 2010). The IRP also recommended that phases be constructed to be independent and self-standing, so that the

P-047-002

project would be functional regardless of whether funding for subsequent phases was ever realized.

The IRP warned that there may not enough money to complete the whole project and that it ought to be designed so that it could be built in phases, and that if subsequent funding did not become available—which it specifically identified as a possibility—that the project would be functional.

> There is a possibility that despite best efforts to assemble funding, the Project Sponsors may encounter a significant shortfall in funding to complete all of CRC as currently envisioned. There is also a possibility that a number of current uncertainties in design and schedule will adversely affect the total cost of the project. Projects of this size and scope are often planned and developed assuming a phased construction effort. Phasing (as opposed to staging) refers to the completion of some major portion of a total project, with such completion having meaningful value, yet deferring subsequent construction till later, often uncertain, dates when additional funding can be obtained.
> Independent Review Panel 2010, Page 185

Because the project will be phased or sequenced, and that phasing plan has not even been presented, much less adopted, no one has any assurance as to what portion of the project will actually be built. Because the project consists of a diverse array of components, some of which increase traffic (new bridge lanes, new intersection capacity), and others which reduce or divert it (light rail transit, tolling), not knowing which phases will actually be built means that the FEIS fails to disclose what will be the net environmental, economic and social impacts of this project. This means the FEIS does not comply with the requirements of NEPA.

2. CRC traffic and toll revenue forecasts are inaccurate, meaning traffic and traffic related impacts are not accurately assessed.

P-047-003

Assessing the environmental, social and land use impacts of the Columbia River Crossing project depends on accurate estimates of future traffic levels. The FEIS purports to offer very detailed estimates of traffic flows across the I-5 bridge and related roadways, through the year 2030.

The traffic and toll revenue forecasts prepared for the Columbia River Crossing are not accurate. The original forecasts were prepared based on 2005 base year data, and were published in 2007, and incorporated in the May 2008, Draft Environmental Impact Statement. The language in the FEIS and DEIS is virtually identical in many cases. The Columbia River Crossing has not produced new forecasts of travel since that time.

P-047-003

This comment has four main elements, each addressed below.

“Actual traffic data show that CRC traffic projections are wrong.”

The methodology used for the CRC project is based on regional growth plans and uses the same models used for all transportation projects undertaken for the Portland-Vancouver region. CRC did not assume uniform growth of traffic from year to year. Estimating future traffic volumes requires a dynamic model with inputs on land use, socioeconomics, trip origins and destinations, and travel mode and route choice. The traffic forecasts used for the CRC project are based on the regional transportation forecasting model developed and operated by Metro and the Southwest Washington Regional Transportation Council (RTC). A multi-jurisdictional team, including all the local partners, has reviewed CRC traffic modeling forecasts. In addition, an independent review panel composed of national experts in the field of traffic modeling conducted an independent analysis in 2008 and validated the methods and results. The panel found that the travel demand model used for CRC is an advanced trip-based tool and that it was a valid tool for a project of this type.

See also the January 21, 2011 memorandum from ODOT Director Matt Garrett to members of the Oregon legislature.This memo responds to comments that Mr. Chris Gerard sent to members of the Oregon legislature in October 2010. Memo is located on CRC website at: http://www.columbiarivercrossing.org/FileLibrary/Memorandums/PlaidPantry_Response.pdf

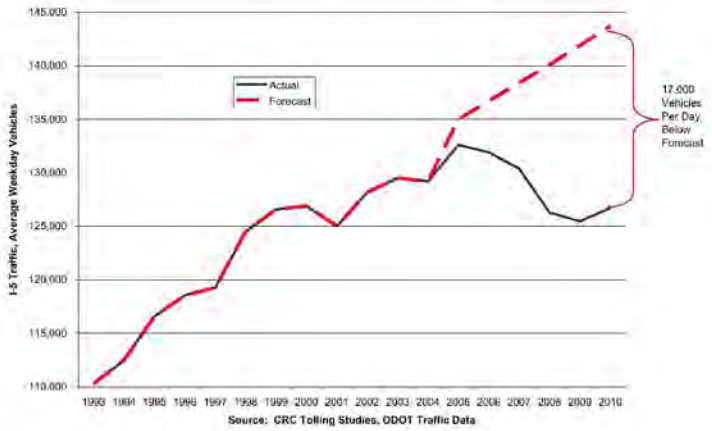
“Independent review confirmed flaws in CRC traffic forecasts”

The Oregon Treasurer contracted with two independent transportation specialists to review the traffic forecasts used for the EIS, from the

P-047-003

Actual traffic data show that CRC traffic projections are wrong. The CRC projections are that traffic on the I-5 bridges should have reached 143,700 vehicles per day in 2010. Actual traffic levels were 126,700 vehicles per day in 2010, 17,000 vehicles per day below the CRC forecast. These figures are based on our analysis of ODOT's data on traffic levels on I-5, through November 2010.

CRC Forecast v. Actual



In addition, the question is not merely whether traffic is increasing again now, but whether they will recover to the previous levels, and whether they will grow at anything close to the rate CRC projected in the DEIS. The evidence shows the growth rate is much slower than forecast, raising serious questions about the project's financial viability.

The Treasurer's independent review of the traffic forecasts confirmed the flaws in CRC traffic forecasts. In 2011, the Oregon State Treasurer retained Robert Bain of RB Consult to review the CRC finance plan and traffic projections. Bain concluded that:

- Traffic and revenue analyses prepare for the CRC were unsuitable for credit analysis
- CRC traffic projections were confusing and outdated
- Authors of the traffic projections failed to examine historical data or verify their models against actual trends

perspective of how they would be used for revenue forecasting. These independent reviews did not evaluate the suitability of the traffic forecasts for NEPA purposes. The RB Consult report includes the following statement regarding the intent of their review, "… the (CRC traffic forecast) reports to date have been prepared primarily to feed into an Environmental Impact Statement process. Others will be better placed to comment on their suitability in that particular context." [1] This statement clarifies that RB Consult did not review the traffic forecasting for its use in NEPA, nor did they consider themselves in a suitable position to provide such a review. Their comments to the Oregon Treasurer were in the context of revenue forecasting, and those comments were addressed by the project in the financial chapter of the FEIS (Chapter 4).

The other report: "Desktop Review of Traffic and Toll Revenue Forecasts" by C&M Associates, Inc. dated June 2011 provides additional perspective. C&M Associates' report explains the differences between the forecasting performed in support of the environmental process and the the future "investment grade" analysis. C&M states "the Desktop Review Team of C&M Associates, Inc. concurred with the statement of the Traffic and Revenue Study in that the purpose of the DEIS documents were to develop traffic forecasts for environmental assessment purposes." Also, C&M states "Based on peer reviews of the work to date and based on the initial review of the documents, the approach appears sound and reasonable for the purposes of the DEIS. The documents show a high level of scrutiny by peer review panels and a high level of coordination among project stakeholders during the DEIS process."[2] Another statement in the C&M Associates' report supports the adequacy of the approach used for the CRC project. The report states, "For the purposes of the DEIS, the generalized cost approach in the travel demand model with the post-processing utilizing VISSIM micro-simulation appears adequate for the forecast of traffic and revenues." [2]

P-047-003

- Diversion estimates to I-205 were "worrying."
- Overall, the CRC appears to have overestimated traffic.
- Toll revenue appears to be over-estimated by 25 percent.

(Bain 2011)

"Both ODOT and CRC consultants have concluded the models used to estimate CRC traffic do not produce valid, accurate estimates of traffic for tolled facilities."

This comment is based on a misunderstanding of the Tolling White Paper 3: Travel Demand Model Sufficiency. This white paper provided some useful suggestions, but it was developed to assess all of the transportation demand models currently used in the state of Oregon. This larger scale assessment provides comments about all models used throughout the state; not all statements are directed at Metro's model.

The white paper had several recommendations to improve modeling, some of which have already been implemented for the CRC project. The recommendations implemented include the CRC project team's use of Metro's Metroscope tool for assessing land use impacts and the VISSIM traffic simulation tool used for corridor analysis. In addition, the project conducted a stated preference survey to help assess the impact of imposing a toll on I-5. The fact that Metroscope and VISSIM have been used specifically for the CRC project and the data obtained from the stated preference survey addresses some of the alleged short-comings of the transportation demand model if it were used alone. This white paper also does not account for the detailed post-processing that was done by CRC. This step involves adjusting the raw transportation demand model outputs for the future to account for the imperfect match between model outputs and actual traffic volumes in the base year condition. This necessary and critical step helps increase the validity of corridor volumes. The post-processing procedures used for the CRC project are consistent with the National Cooperative Highway Research Program (NCHRP) Report 255 – Highway Traffic Data for Urbanized Area Project Planning and Design published by the National Academy of Science's Transportation Research Board.

P-047-003

Both ODOT and CRC consultants have concluded that the models used to estimate CRC traffic do not produce valid, accurate estimates of traffic for tolled facilities. In February 2009, the Oregon Department of Transportation received a report prepared by Parsons Brinckerhoff, David Evans and Associates Inc., and Stantec Consulting Services Inc. The authors of this report all happen to be contractors for the Columbia River Crossing project. The report is entitled *Tolling White Paper 3: Travel Demand Model Sufficiency*. This document is available on the Internet at the following address: http://www.oregon.gov/ODOT/TD/TP/docs/LRPU/twp3.pdf

ODOT's report finds that the current models used to forecast traffic in Oregon, and specifically in the Portland Metropolitan Area, including the Metro model, are inadequate to accurately predict traffic volumes on tolled facilities, such as the proposed Columbia River Crossing. Consider ODOT's summary of this report:

> Existing models in Oregon are rated as excellent for the purposes they were designed, and some are internationally recognized. However, Oregon models have not been specifically designed to evaluate toll projects, so **planners are not able to confidently forecast travel patterns for projects that are considering tolling/pricing. Existing models are not able to determine how travelers would change their mode, route, travel time, or destination in response to tolling/pricing.**
> Oregon Department of Transportation, Tolling and Travel Demand Model Sufficiency, Highlights of Tolling White Paper 3, March 2009, page 1, http://www.oregon.gov/ODOT/TD/TP/docs/LRPU/Highlight3.pdf#Tolling_White_Paper_3
> (Emphasis added)

As the ODOT study shows, the Oregon Department of Transportation and the principal contractors for the Columbia River Crossing concur that the traffic forecasting methods used by the CRC are not accurate or reliable. Accurate estimates of future traffic levels are central to assessing the need for this project, justifying its size, evaluating its environmental impacts, and most crucially, determining the viability of its financial plan.

The recession does not explain the decline in I-5 traffic, and in any case, CRC has not revised its traffic projections or impact analysis to reflect the much slower rate of growth. It has been claimed that the decline in traffic since 2005 is attributable to the economic recession which began in December 2007. The current staff report alludes to this same argument, claiming that the traffic projections and financial documents need to be "recalibrated to reflect stalled economic growth." (Staff report, PDF page 30). Robert Bain, the consultant to the Oregon State Treasurer conclusively disposed of this argument in his report:

> Traffic volumes using the I-5 Bridge have flattened-off over the last 15-20 years; well before the current recessionary period. This is highlighted by the red dotted

The Oregon Modeling Steering Committee (OMSC) provided a more detailed response to the Tolling White Paper 3, refuting a number of the details of the paper and its conclusions (http://www.oregon.gov/ODOT/TD/TP/docs/LRPU/Report.pdf).

"CRC has not revised its traffic projections to reflect the much slower rate of growth."

Traffic forecasts are not based simply on projecting recent trends, but on developing future forecasts of transportation use based on other variables including population and employment forecasts. Metro's transportation demand model relies on the adopted land use plans of the region's cities and counties including the areas identified for residential, commercial, and industrial development. The approach used to develop traffic volume forecasts for the EIS is summarized on page 3-27 of the FEIS and is detailed in the CRC Traffic Technical Report. In its July 27, 2010 report, the Independent Review Panel expressed concerns that too much focus on the 2030 planning horizon could lead to undersizing the bridge. The IRP commented "The desirability of living in the Portland/Vancouver region is not going to diminish, so populations will continue to grow…. [T]he IRP believes the greatest risk in the decision-making process is not over-sizing the bridges but not building enough capacity for the next 100 years." As noted in the FEIS (page 3-27), it is important to remember that a delay in meeting the 20 year traffic forecasts would have little meaningful effect on the design of a facility intended to serve long-term needs and to last for many decades.

[1] Bain, Robert. (2011). Columbia River Crossing Review of Traffic & Revenue Reports and Related Material, Summary Report, RBConsult Ltd., London, 4 July 2011.

[2] Vargas, Herbert. (2011) Columbia River Crossing Desktop Review of

P-047-003

trend line in the chart below which was estimated up to and including the year 2006 (i.e. it omits the recent 2007 – 2010 period characterised by fuel price hikes and economic recession). The clear inference is that the flattening-off is a long-term traffic trend; not simply a manifestation of recent circumstances. (Bain 2011, page 3)

And even though CRC financial plans now concede that DEIS projections are wrong, the traffic estimates in the FEIS—which form the basis of the claims about the project's environmental, social, traffic and economic impacts—have not been revised to reflect this new reality—they are essentially the same traffic figures given in the DEIS.

Most of the impact analysis in the FEIS is based, directly or indirectly, on comparisons of traffic levels between the no-build alternative and the proposed project, and these traffic level estimates are drawn from data that has been shown to be wrong, from models that are not even designed forecast traffic for tolled facilities like the CRC, and which have not been updated to reflect the acknowledged changes that have occurred since the DEIS was published. Consequently, the FEIS does not constitute a fair and reasonable analysis or disclosure of the environmental, social, and economic impacts of the CRC.

3. The FEIS fails to meet US DOT's own requirement that funding be reasonably available in the region's fiscally constrained transportation plan.

P-047-004

U.S. DOT policy requires that US DOT not approve a Final Environmental Impact Statement for any project for which reasonably available funding has not been identified in the region's approved fiscally constrained transportation plan. The US DOT's transportation planning requirements provide:

Table 2. Fiscal Constraint Requirement before Approving the NEPA Decision

Before a Final Environmental Decision (ROD, FONSI, CE) is approved in:	Fiscal Constraint must be demonstrated by:
Metropolitan Areas	• Entire Project is in the MTP • At least one subsequent phase of the Project is in the TIP (more if within TIP timeframe) • Full funding is reasonably available for the completion of the entire Project

Source: U.S. Department of Transportation, Office of Planning, Environment, and Realty, Supplement to January 28, 2008 "Transportation Planning Requirements and Their Relationship to NEPA Process Completion" February 9, 2011

Traffic and Revenue Forecasts, Final Report, C&M Associates, Inc., Dallas, June 30, 2011.

P-047-004

While US senators and members of congress, as well as federal agency officials, have expressed a variety of opinions regarding the potential for CRC to obtain different types and levels of federal funding, the current project finance plan identifies reasonably foreseeable funding sources for the completion of the project (chapter 4 of the FEIS). The CRC project is in the Metropolitan Transportation Plan (MTP), the Regional Transportation Plan (RTP) and the State Transportation Improvement Programs (STIP).

The current adopted State Transportation Improvement Programs (STIPs) for Oregon and Washington include funding for the I-5/Columbia River Crossing project. The Oregon STIP covers the years 2010 to 2013 and provides $83,854,000 from a variety of sources which is slated for preliminary engineering design. The Washington STIP covers the years 2011 to 2014 and provides a total of $52,001,000 for preliminary engineering design. The Washington STIP also includes $200,000 to fund preliminary engineering design of interim safety improvements on I-5 in the CRC project area.

The draft Oregon STIP for 2012 to 2015 is currently under development and will be adopted over the next few months. This document identifies $58,853,000 for the I-5/Columbia River Crossing project, all of which is earmarked for preliminary engineering. The Metropolitan Transportation Improvement Program (MTIP) for the Portland MPO also includes the same dollar amount for CRC and is designated for preliminary engineering.

The draft Washington STIP for 2012-2015 is currently under development and will be adopted over the next few months. This

P-047-004

Nearly all of the elements of the financial plan for the CRC are speculative or un-approved.

A cornerstone of the CRC finance plan is the claim that $400 million will be available from the federal government as a result of an earmark or other discretionary funding, over and above funding that would otherwise come to the region, because of the alleged special character of this project. (The latest version of the plan actually assumes a $500 earmark in some scenarios).

For years, CRC advocates have traded on the idea that the CRC is a special project that will get funding from "a special pot" that wouldn't otherwise be available to the region, and that it wouldn't compete for dollars that could go to other projects, like federal formula funds. For example, earlier this year, Matt Garrett, ODOT director said:

> "Federal highway funds are being sought from a category known as Projects of National Significance. Very few projects in the country and no other projects in the region can compete for these funds . . . . These sources are unique to the CRC project and do not affect other Oregon projects."

Notice in particular three things about Mr. Garrett's statements. First, the passive voice and indefinite form "funds will be sought." Second, Mr. Garrett is silent on what would happen if these discretionary funds either aren't available, or fall short of the amounts being "sought." And third, Mr. Garrett in no way rules out seeking funding for CRC from other sources.

The just released FEIS Financial Plan, however, opens the door to using funding the CRC using federal formula allocations that are available for a wide range of projects in the region and the state. The financial plan tries to downplay the likelihood that these funds will be used.

"Federal Revenue and Financing Options"

Federal Formula Funds

ODOT, WSDOT, C-TRAN, TriMet, Portland's Metro Regional Government (Metro), and the Southwest Washington Regional Transportation Council (RTC) receive transportation funding from a variety of federal formula grant programs. In an urban area, the metropolitan planning organizations (MPOs) program these funds to specific eligible uses. In the Portland-Vancouver region, this is accomplished through Metro's or RTC's Metropolitan Transportation Improvement Program (MTIP) processes. State and federal funds are also programmed in ODOT's and WSDOT's State Transportation Improvement Programs (STIPs). While federal formula funds potentially could be used for the CRC project, many of these funds are currently programmed for other uses, and the finance plan for the CRC

document identifies $38,548,000 for the I-5/Columbia River Crossing project, which is designated for right-of-way acquisition. The MTIP for the Vancouver MPO, which was adopted on October 4, 2011 by the Regional Transportation Council's Board of Directors acting as the MPO, includes the same project and dollar amount as the draft STIP.

P-047-004

project does not anticipate reprogramming of these funds.
(Final Environmental Impact Statement, Finance Plan, Section 4.3.1, page 4-7)

It is clear from this wording that there is no definitive determination of whether any funds are actually available or committed for the CRC. The wording of the FEIS Financial Plan makes it clear that everything about the plan is effectively hypothetical, and will change later.

> As stated earlier, the financial plan scenarios discussed above are illustrative of the financial tradeoffs between the alternatives. The finance plan will be refined during final design, and the final plan may differ from the scenarios discussed above.
> (Final Environmental Impact Statement, Financial Plan, page 4-18)

The current illustrative financial plan scenarios are valid if, and only if, the CRC could obtain a $400 million to $500 million earmark or discretionary allocation. That was always at best just a speculation. Recent developments in Washington DC make it clear that it is a virtual impossibility.

ODOT Director Matt Garrett conceded there was currently no evidence that there would be any such funding available as part of the transportation reauthorization process:

> We thought there might be a specific project of national significance. At least with the language we have right now, the discretionary money is not really clear where that's going to present itself.
> Matt Garret, Metro LUFO Hearing August 11, 2011

More recently, Peter DeFazio, a key legislator, whose support is vital to any federal funding, has repeatedly expressed his dismay about the size and cost of the CRC. On August 7, DeFazio told the Associated Press that the outlook for funding for the Columbia River Crossing is now "very, very, very, very grim." (Fought and Cooper 2011).

In the Oregonian on August 14, DeFazio said:

> "I kept on telling the project to keep the costs down, don't build a gold-plated project," a clearly frustrated DeFazio said. "How can you have a $4 billion project? They let the engineers loose, told them to solve all the region's infrastructure problems in one fell swoop... They need to get it all straight and come up with a viable project, a viable financing plan that can withstand a vigorous review."
> (Manning, Jeff. "Columbia River Crossing could be a casualty of the federal budget crunch", The Oregonian, August 14, 2011).

P-047-004

Later, DeFazio told Oregon Public Broadcasting:

> "I said, how can it cost three or four billion bucks to go across the Columbia River? . . . Now with the proposed Republican cuts in transportation . . . they want to cut this [transportation spending] by 35 percent, that means minimally we lose 600,000 to a million jobs and projects like this don't go forward. . . . Right now it's very problematic. . . . The Columbia River Crossing problem was thrown out to engineers, it wasn't overseen: they said solve all the problems in this twelve-mile corridor and they did it in a big engineering way, and not in an appropriate way.
> "Think Out Loud," Oregon Public Broadcasting, August 18, 2011.

Federal transportation funding faces major cutbacks. There are no earmarks or projects of national significance. As a result, CRC's funding strategy is tantamount to "bait and switch": advocates tell everyone that the federal money for the CRC will come from a "special pot" of earmarks that won't compete with other local projects, and but it should be increasingly clear that when this doesn't materialize, they will seek funding from all of the other sources of funds listed in the FEIS.

When they do, this will reduce the amount of money available for other projects in the region. Because the CRC is such a large project with a high risk of cost overruns, and because it faces revenue shortfalls from other funding sources, it would likely be a drain on the region's transportation financing capacity the next decade. Indeed, the recently released project schedule—which does not include phasing—extends the construction period to 2023. No one in the region has identified, approved, or committed funds for the construction of the CRC. Therefore, to move forward with this project would be a violation of US DOT's own policy requiring that the reasonable availability of funds for a project in a fiscally constrained plan be in place prior to approving the FEIS.

4. Historical data show that traffic levels on I-5 are declining, and prove that FEIS traffic estimates are inaccurate

P-047-005

The levels of traffic crossing the I-5 and I-205 bridges are the central issue raised by this FEIS. The need for the project is predicated on the claim that traffic levels are steadily increasing, and that additional capacity is needed. The Environmental Impact Statement's claims hinge on a comparison of predicted future traffic levels with, and without the bridge.

P-047-005

There are six needs behind the proposed CRC project. Highway congestion, which is already substantial in this section of I-5 and is projected to grow worse as the region's population increases, is among those needs, as described in Chapter 1 of the FEIS.

The traffic volume cited in the FEIS (134,000) was from a specific count conducted in October 2005 when all ramps and the mainline volumes were obtained simultaneously. The October 2005 day, which needed to be selected in advance for the major traffic counting effort, was within one percent of the average weekday traffic volume for the entire year. Average weekday volumes for August 2005 exceeded 140,000. Traffic volumes do fluctuate and decreased between 2006 and 2009. Traffic volumes obtained from the Oregon Department of Transportation's automatic traffic recorder (ATR) monitoring sites show that traffic volumes have been increasing in since 2009. The most recent data available from ODOT's ATR sites on I-5 indicate that the AWDT for 2010 is 1.12% above the 2009 volumes. For the first six months of 2011, the ODOT data showed a 1.00% increase over 2010. During the peak hours of travel, the return to higher volumes has been even more pronounced. For example, in the northbound direction on I-5, between 3:00 pm and 7:00 pm, volumes increased by 8.6% between 2008 and 2009 and another 8.6% between 2009 and 2010. These data are from Portland State University's Portal data, the official transportation archive for the Portland-Vancouver metropolitan region, data set for MP 307.9 (the Interstate Bridge).

It's also important to put the relationship between the 2030 forecasts and the project design into perspective. Whether the population and traffic forecasts are met by 2030 or 2035 makes no meaningful difference to the design of a facility intended to last for many decades and to serve long-term needs.

P-047-005

Even though traffic is at the heart of the need for this project, and is central to evaluating and disclosing its environmental impacts, the FEIS contains a paucity of actual data on traffic levels. The baseline traffic levels reported in the FEIS are purported to represent 2005 "base year" conditions.

The FEIS contains no actual data on current traffic levels over the I-5 bridges. The most recent data are from 2005.

According to the FEIS, the levels of reported traffic in 2005 was 134,000 vehicles per day. That figure is, in fact, not accurate. According to ODOT's published data, traffic in 2005 was 132,600 vehicles per day. If the FEIS does not even contain correct data about so-called "base year" traffic six years ago, how can anyone put any faith in the project's projections of traffic levels two decades hence?

We are a significant way (more than 20 percent) through the forecast period, and the FEIS contains no information that would enable one to validate the estimates contained in traffic projections. Actual data on traffic levels over the I-5 and I-205 bridges between 2005 and 2011 are omitted from the FEIS. The FEIS actually contains no historical time series data on traffic levels.

The CRC predicts sustained rapid growth in the no-build scenario, but has done nothing to validate its predictions, even though we have six years of actual experience since the base year of their projections. The base year for the forecasts of future traffic for the Columbia River Crossing is 2005, with a stated level of 134,000 vehicles per day. The CRC forecasts that traffic in the no-build scenario on the I-5 bridges will be 184,000 vehicles per day in 2030.

We now have nearly six years of experience—more 20 percent of the planning period--since the base year of the CRC traffic forecasts. CRC has done nothing to test whether their estimates have been borne out by actual experience.

The Oregon and Washington Departments of Transportation collect data that track the average level of traffic volumes on I-5 across the Columbia River. These data are reported by the Southwest Washington Regional Transportation Council. Data are from the council website: http://www.rtc.wa.gov/data/traffic/brdgawd.asp "Columbia River Bridges." The following table shows average annual traffic over the I-5 Columbia River Bridges for the past 15 years. It also displays the annual growth rate of traffic each year, compared to the preceding year, and the average annual growth rate for three five-year periods.

P-047-005

Average Daily Traffic, I-5 Bridges,

Year	Average Daily Traffic	Annual Growth Rate
1994	112,988	
1995	116,589	3.2%
1996	118,558	1.7%
1997	120,644	1.8%
1998	124,516	3.2%
1999	126,589	1.7%
2000	126,903	0.2%
2001	125,652	-1.0%
2002	128,162	2.0%
2003	129,657	1.2%
2004	130,279	0.5%
2005	132,603	1.8%
2006	131,916	-0.5%
2007	130,389	-1.2%
2008	126,278	-3.2%
2009	125,436	-0.7%
Annual Average Growth (Five-year Periods)		
1994-1999		2.3%
1999-2004		0.6%
2004-2009		-0.8%

This data shows several key trends. First, for the past four years, average traffic levels on the I-5 bridges have been declining, not increasing. Second, the growth rate in traffic on the I-5 bridges has been decelerating for the entire period shown in this table. Growth rates averaged 2.3 percent per year during the late 1990s, only 0.6 percent per year in the next five-year period through 2004, and traffic decreased at an average rate of 0.8 percent per year for the past five years. Third, the slowdown in traffic growth rates and the annual decline in traffic clearly preceded the recession that began in December 2007.

It is apparent that the baseline forecast for growth of I-5 traffic included in the Final Environmental Impact Statement assumed a very dramatic acceleration in traffic growth from historical trends. To grow from a 2005 level estimated at 134,000 to a projected 2030 level of 184,000 in the FEIS base case, I-5 traffic would need to increase 1.3 percent per year over the 25-year period, 2005 to 2030. That would require more than doubling the rate of growth actually observed in the 1999-2004 period (0.6 percent). And as illustrated above, the historical data show that the rate of traffic increase has been decelerating (and now declining) and not increasing, as forecast in the FEIS. The FEIS and the traffic projections offer no explanation as to why the rate of increase of traffic should more than double from this long term trend.

P-047-005

Figure 1 shows the actual level of traffic reported by the Regional Planning Council (from the table above), and the forecast level of traffic growth required to achieve the 2030 projection of 184,000 vehicles per day. The actual level of traffic recorded in 2009 was roughly 14,000 vehicles less than the more than 140,000 vehicles per day implied by the CRC traffic forecasts. Whereas the CRC forecast implied that traffic over the I-5 bridges (in the no build scenario) would increase by almost 7,000 vehicles per day; in reality, the number of vehicles crossing the bridge declined by 7,000.

Figure 1: I-5 Bridge Traffic: Actual v. Predicted

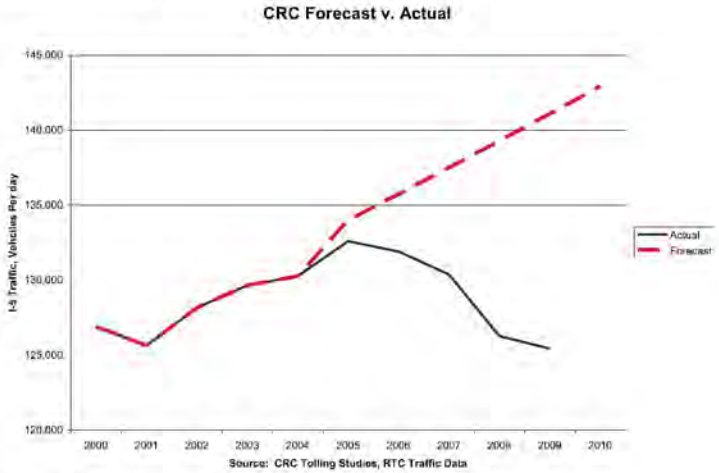
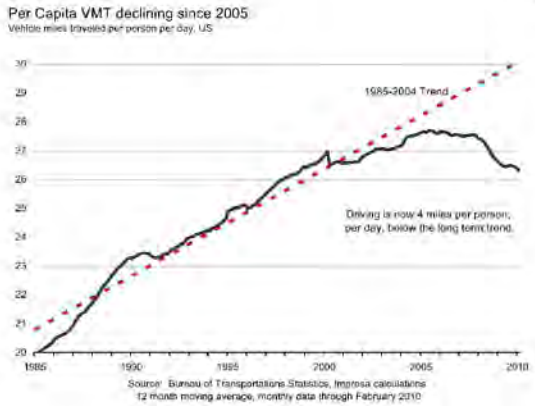


Figure 2: National Trends in Vehicle Miles Traveled

P-047-005



As Figure 2 makes clear, travel demand estimates based on pre-2005 trends are very likely to overestimate travel demand growth. Following the big increase in gas prices after 2004, American citizens began driving less. That trend has persisted over the past five years.

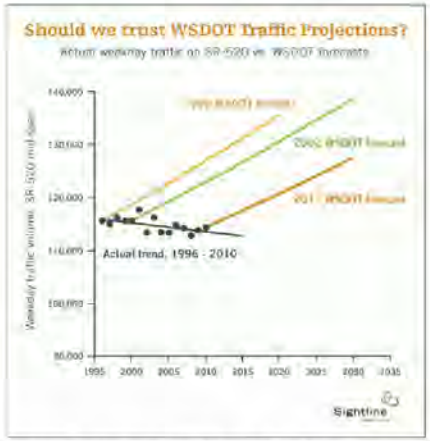
It might be argued that the past four years of declining traffic are a temporary aberration, and that in the longer term, forecast growth will make up for these declines. This is unlikely to be true for three reasons. First, as noted above, the trend has been for a decelerating rate of growth over the past 15 years. Second, as discussed below, changes in gas prices and consumer behavior that are very long term in nature are behind the decline in CRC traffic. And third, the departure from forecast experienced so far means it is likely impossible to make up the shortfall over the remaining time in the forecast period. In order to reach the expected No-Build 2030 traffic volumes of 184,000 from the actual 2009 level of traffic, traffic would have to increase by 1.85 percent per year for each of the next 20 years. That is a growth rate about forty percent faster than the 1.30 percent forecast in the DEIS, and two and a half times faster than the 0.7 percent growth rate actually observed over the fifteen year period 1994 to 2009. The CRC project materials provide no basis for believing such a dramatic increase in driving will occur.

The tendency to overestimate future traffic levels in mature travel corridors is also apparently an endemic problem with the current methodology used to predict future transportation demand. After a careful review of the literature, the Government Accountability Office found:

P-047-005

> . . . current travel demand models tend to predict unreasonably bad conditions in the absence of a proposed highway or transit investment. Travel forecasting, as previously discussed, does not contend well with land-use changes or effects on nearby roads or other transportation alternatives that result from transportation improvements or growing congestion. Before conditions get as bad as they are forecasted, people make other changes, such as residence or employment changes to avoid the excessive travel costs.
> (Government Accountability Office, 2005)

This pattern—of overestimating future growth is a regular and repeated characteristic of the models used by the sponsoring agencies. For example, consider the Washington Department of Transportation's models of traffic levels on the 520 Floating Bridge in the Seattle area. They invariably predict increasing levels of traffic—which are not realized in practice. In fact, rather than increasing, traffic levels have generally declined.



Source: Williams-Derry, 2011 "WSDOT vs. Reality" www.sightline.com

The weakness of transportation models in accurately predicting future traffic levels is a continuing problem. So it is not merely the CRC traffic projection model that is problematic; rather the entire class of four-step (trip generation, assignment, mode, routing models) have proved inaccurate in practice. After an exhaustive review of the state of the art, the Transportation Research Board of the National Academies wrote:

P-047-005

> "In 2005, as has been true for the past four decades, these models could not provide accurate information to inform decision making on many transportation and land use policies or traffic operation projects."
> (Committee for Determination of the State of the Practice in Metropolitan Area Travel Forecasting, 2007)

While technology has allowed for faster computation, and more detailed mapping, they conclude:

> "The practice of metropolitan travel forecasting has been resistant to fundamental change. Every 10 years or so there begins a cycle of research, innovation, resolve to put innovation into practice, and eventual failure to affect any appreciable change in how travel forecasting is practiced."
> (Committee for Determination of the State of the Practice in Metropolitan Area Travel Forecasting, 2007) pages 123-124.

This FEIS document is predicated on the belief that models and their results somehow trump reality. Traffic levels across the I-5 bridges have never been as high as asserted in the base case (2005) modeling for the FEIS. And they are not increasing, nor increasing at a rate more than double any time during the past twenty years, they are in fact declining. There are serious reasons to doubt the reliability of these models, especially given the dramatic changes in gas prices, and observable, non-transitory changes in travel behavior. It is especially egregious that the FEIS omits any presentation of actual trend data on traffic levels, and instead relies entirely on its own unverified models. As a result, the FEIS is not a factual or scientific document: it is a fairy-tale. Such a document cannot possibly be construed to comply with the requirements of the National Environmental Policy Act.

5. An "Investment-grade traffic forecast" would show substantially different traffic and pollution effects

P-047-006

CRC has not prepared an investment-grade forecast. Investment grade forecasts use more realistic assumptions about travel behavior on tolled facilities. While in public statements, CRC officials have claimed that the investment grade forecast is a mere "refinement" of the forecasts contained in the FEIS, that is untrue. The investment grade forecasts show that traffic may be much more sensitive to tolls that allowed for in the FEIS models. For example, the Investment Grade Forecast prepared for the Washington State Department of Transportation showed that traffic levels on the 520 Floating Bridge would fall by almost half when tolls were introduced, because drivers would shift to the parallel and un-tolled I-90 bridge. (Wilbur Smith & Associates, Wilbur Smith Associates, "SR 520 Bridge Investment Grade Traffic and Revenue Study," Washington

P-047-006

There are a variety of modeling and forecasting tools and each has its particular uses, functions and limitations. The federal, state and local CRC partners fully recognize that an "investment grade" traffic forecast will need to be made at the appropriate time, for a particular purpose.

Investment grade forecasting has a particular purpose – primarily to manage financial risk associated with repayment of bonds through toll revenues. This differs from the travel demand forecasting that is done for the purposes of planning and designing a facility. This latter type of modeling is intended primarily to understand how the alternatives would be likely to affect transportation system operations and related environmental impacts. It is used to help determine the size and character of the project, and to understand its impacts. Neither type of modeling can be said to be more accurate than the other. Each type has its own primary purpose and function. See the response to Mr. Cortright's previous comment regarding independent review of the traffic forecasts. That response includes an explanation of the difference in purpose of investment grade forecasting versus NEPA forecasting, as quoted from the C&M report.

P-047-006

State Department of Transportation, August 29, 2011, http://www.wsdot.wa.gov/NR/rdonlyres/A3B026EC-C9AF-4B43-BA31-4CB30FFD2CEB/0/SR520InvestmentGradeStudy.pdf.)

The situation is nearly identical for the Columbia River Crossing. While the I-5 bridge is proposed to be tolled, the parallel I-205 bridge is not. Consequently, more traffic may be diverted from I-5 to I-205, producing much higher levels of congestion than estimated in the FEIS. The failure to accurately estimate traffic effects means that the FEIS does not comply with NEPA because it doesn't reveal what the actual patterns of traffic will be under the LPA. CRC should be required to disclose the actual patterns of traffic than can be expected by undertaking an "investment grade" analysis prior as part of the NEPA review.

6. Metroscope estimates of induced demand effects are implausible and contradict FEIS travel estimates

P-047-007

The FEIS relies for validation of its minimal impacts on land use on the Metro "Metroscope" model. The results of the Metroscope model are not plausible, and are not consistent with the literature on induced demand. The Metroscope forecast predicts that the existing 6 travel lanes on the I-5 bridge would accommodate 18,067 trips in the afternoon peak in 2030 under the No-Build alternative. In contrast, the LPA is predicted without tolls--with 10 lanes of traffic—is predicted would accommodate just 18,643 trips in the two hours of the afternoon peak in 2030. There is no reasonable basis for estimating that a 66% increase in capacity (3 lanes to 5 lanes) would produce only a 3% increase in traffic over the next decade compared to the no-build.

The Metroscope model is based in part on the Metro transportation forecasting model, which the Oregon Department of Transportation and CRC consultants have determined are not capable of accurately predicting traffic on tolled facilities.

In addition, there is no evidence that the Metroscope models are consistent with, or support the traffic forecasts contained in the FEIS. The FEIS claims that automobile traffic during the PM peak hour would be 33% higher under the LPA than under the No-build (FEIS, Summary, Exhibit 18). The Metroscope model claims that automobile traffic during the PM peak hour would be 10% lower under the LPA than under the No-Build (Metroscope, Figure 3.3-1 2030 PM 2-Hour Travel Time Histograms by Alternative, page 25). Far from confirming the findings of the FEIS, the Metroscope model contradicts them. With plainly contradictory evidence that is unexplained by the FEIS, no one can reasonably assume that the FEIS accurately characterizes the environmental impacts of the LPA.

P-047-007

Metroscope's principal use for the EIS was to test the indirect or induced land use effects of the CRC project, including its added highway capacity, light rail transit, and tolling. Metroscope provides an estimated projection of how the project might indirectly affect land use (household and job location) over time. The results of various model runs are intended to be assessed against each other.

While Metroscope modeling is used to test the potential indirect land use effects from the project, it is not used to predict the project's direct effects on traffic operations, ridership or other performance metrics. Both tools start with the results of Metro's regional travel demand model but then take different steps in order to address the particular analytical questions that each is intended to answer. As a result of these different steps, the results of the volumes reported from the VISSIM model will never exactly match those of the regional travel demand model. However, the FEIS traffic demands illustrate similar patterns to the Metroscope traffic demands when comparing the No-Build and Build-with-Tolls scenarios. As for comparing the volumes shown in the FEIS, Summary, Exhibit 18 (traffic throughput) and volumes shown in Metroscope Figure 3-1.1 (traffic demand) this is an apples-to-oranges comparison. As stated on Page 3-9 of the FEIS the terms traffic demand and traffic throughput have different meanings. Traffic demand refers to the total number of motorists attempting to access the transportation system, including those caught in congestion. Traffic throughput is the total number of motorists actually able to travel through the transportation facility. When traffic demand exceeds traffic throughput, congestion occurs and some motorists are forced to take alternative routes or experience delays.

See also the response to comment P-047-010 below.

7. Projections grossly over-estimate base case traffic, and under-estimate induced demand, thereby biasing estimates and concealing the project's true environment impacts.

P-047-008

It is evident that the FEIS creates a fictitiously high level of predicted no-build traffic for two reasons. First, this creates a justification for the project. Second, it enables the project to claim that the traffic volumes created by the LPA will be less than the artificially inflated "no-build" scenario, and will therefore have fewer impacts.

8. Models fail to adjust for changing gasoline prices and dramatic shift in traffic trends.

P-047-009

The modeling for the CRC is based on 1994 vintage regional transportation surveys, and implicitly assumes that gasoline prices will be low and stable. It does not reflect the tripling of gasoline prices in the past decade or their effects on travel behavior, mode choice, and land use development patterns.

CRC traffic forecasts appear to be badly out of date, and there is no evidence that they have been adjusted to deal with current gasoline prices or development trends. The CRC traffic forecasts are poorly documented, and don't indicate what baseline data were used, what assumptions were made, and what error and uncertainty factors are associated with these estimates. It appears from the documents included in the Draft Environmental Impact Statement that traffic projections were made in 2007, based on 2005 data. The key measures of traffic activity (184,000 crossings of the I-5 bridge in the no-build, and 178,000 in the build alternatives), have remained essentially unchanged for several years. (See for example, Draft Environmental Impact Statement, Summary, Exhibit 26 Summary of Transportation Effects and Cost for Each Alternative, Page S-30). The forecast documents, including those released in 2010, use the same numbers (184,000 in the no-build, and 181,000 for the LPA) as the project has publicly quoted since the DEIS was released in 2008. The forecast documents refer to the "current year" for traffic purposes as "2005." The modeling was based on Metro's transportation model (Columbia River Crossing, 2010f). The Metro model was calibrated based on behavioral data collected in 1994 and assumes that real gasoline prices would not increase at all, i.e. that gasoline prices increase no faster than the rate of inflation (Higgins, 2008).

P-047-008

Mr. Cortright's assertion that the No-Build Alternative's traffic forecasts are overestimated and that the effect of induced demand are underestimated is addressed in responses to his other comments, above and below.

P-047-009

Metro's regional travel demand model uses the total auto operating cost (on a per-mile basis) of a vehicle as an input into the model's forecast of travel demand and resulting roadway volumes. The total auto operating cost of a motor vehicle is based upon an annual calculation made by AAA. The total operating costs include gas, oil, maintenance and tires. For future year forecasts (i.e., 2030), the model assumes that this auto operating cost per mile will rise with inflation.

Fuel costs within the Metro travel demand model are considered as part of the auto operating cost, which consists of gasoline and oil, tire, and general vehicle maintenance costs on a per mile basis. In reviewing historical data, the cost to operate a vehicle has increased almost exactly the same as the inflation rates for nearly two decades, even during times of fluctuating fuel prices. This is partly a result of consumers' responses, both in the short term and longer term. Travelers reaction options to rapidly changing fuel prices are somewhat limited in the short term, but over the long term many consumers tend shift to more fuel efficient vehicles. Changing technologies and policy actions are expected to further improve fuel efficiencies.

The Travel Demand Review Panel, which conducted its review in late 2008, assessed the project's approach with regard to vehicle operating costs. One of the specific questions asked of the Panel was "Are fuel price and vehicle operating cost assumptions used in the model reasonable?" The Panel's response was unambiguous. It states "The Panel concluded that the vehicle operating cost assumptions, of which

P-047-009

There is clear evidence that the persistently much higher level of gas prices since 2005 has produced a sea change in consumer behavior. Nationally, per capita driving has been in decline since 2004, and is now at 1999 levels.

Consumers are not only driving less, but are scrapping cars faster than they are buying new ones. Nationally, the number of vehicles in operation declined by four million in 2009 (Brown, 2010). In Oregon, vehicle registrations have declined by 30,000 compared to the previous year (Har, 2010).

The rise in gasoline prices and a growing interest in alternatives to car-dependent living has triggered a shift in housing markets within metropolitan areas. The biggest price decreases in housing and the highest foreclosure and default rates have been recorded in outlying suburban locations (Cortright, 2008).

The CRC's transportation model is based on observations made in 2005, and assumes the consumers will continue to behave as they did in 1994 (when gasoline cost $1.10 gallon). As a result CRC predicts the rate of increase of vehicle travel will be double that of the previous decade. This is highly suspect in a world where gasoline prices have more than doubled, where driving is in decline, and consumer behavior patterns are obviously changing.

A wealth of evidence shows that car ownership is declining, the number of young drivers is declining, that vehicle miles traveled are declining, and that gasoline sales are declining, both nationally and in Oregon and Washington. The FEIS contains no analysis of these trends. See for example articles by Williams-Derry, 2011.

9. FEIS claims about induced demand are incorrect and the FEIS summary of induced demand literature distorts the professional consensus.

P-047-010

The FEIS misrepresents the academic literature on induced demand and distorts the findings of its own literature review.

The FEIS report on Indirect Effects (Appendix A, page A-1) reports that the predecessor of the CRC commissioned Parsons Brinckerhoff to conduct a literature review of 75 studies of the effect of transportation facilities on demand. While the text of the report purports to summarize the findings of the report, the FEIS neither includes quotations from the actual report or the report itself. I obtained a copy of the report. Among its conclusions:

> 1.5. Households reinvest travel time savings in longer trips and more travel.

fuel costs are a component, used in the model for the primary travel demand forecasts were reasonable. The Panel confirmed that vehicle operating costs (which consists of gasoline and oil, tire, and general maintenance costs on a per mile basis) is the appropriate measure to use as it reflects the long-term relationship between fuel price and vehicle fleet fuel efficiency. In the Panel's opinion there was an adequate stratification of fuel cost, other costs and buildup of auto operating costs in the modeling process."[1]

Recent traffic count data fluctuations are discussed in other responses to Mr. Cortright's letter.

[1] Outwater, Maren. (2008) Columbia River Crossing Travel Demand Model Review Panel Report, Travel Demand Model Review Panel, Vancouver, November 25, 2008

P-047-010

The citations from the academic literature noted in the Mr. Cortright's comment do not contradict the literature referenced in the CRC FEIS. The main difference between the citations is that Mr. Cortright did not include the more detailed findings about induced demand from the academic literature as discussed in the FEIS. While some reports noted that increased highway capacity tends to have an effect on induced growth, the literature provides much more information on the specific variables that are associated with induced growth. These variables are important in evaluating the potential induced growth effects of any specific proposal, including the proposed CRC project. They are discussed in the Final EIS (pages 3-116 through 3-119) and further detailed in the CRC Indirect Effects Technical Report.

P-047-010

> Household location choice is influenced by many factors including: housing costs, access to jobs, access to goods and services, type of community, amenities/quality of life, public services/schools and property tax rates. The more numerous non-work trips for personal, family, civic, education, and recreation, may prove to be equally as significant as the work trip in housing location choice, especially for multiple worker households. Evidence suggests that households do not locate so as to minimize their travel distance from work; rather, they tend to keep their overall travel time within a certain amount, Despite differences in travel conditions and opportunities across US cities over the past 20-year, people spend the same amount of time per day, on average, in travel. The stability in commuting travel times suggests that transport accessibility improvements will allow households to locate further away from jobs, and that that any travel time savings may be used for more travel. (In the Vancouver-Portland region it may lead to household locations in outlying cities, rather than in the "rural sprawl" that typifies most other metropolitan areas.) The development shift to the suburbs in the past few decades initially reduced commute travel times as housing and jobs co-located along previously uncongested freeways. However, the increased traffic congestion of suburban areas has led to larger increases of late in suburban commute times.
> Parsons Brinckerhoff, Land Use-Transportation Literature Review For the I-5 Trade Corridor Regional Land Use Committee, September 17, 2001, page 12

The latest literature on induced demand—which is not addressed in the FEIS or DEIS—takes the very strong view that additional transportation capacity directly induces additional travel. One paper published by the National Bureau of Economic Research, elevates the proposition to a "fundamental law"—finding that for interstate highways in metropolitan areas distances traveled increase one for one with interstate highway lane miles. (Duranton & Turner, The Fundamental Law of Road Congestion: Evidence from US Cities, National Bureau of Economic Research, 2009, No. 15376).

Moreover, the FEIS too narrowly defines induced demand to be demand resulting from changes in land use patterns due to changes in accessibility. This is only one of several sources of induced, or generated demand. Additional transportation system capacity can cause more and longer trips even without changes in land use patterns. See for example Litman:

> Traffic congestion tends to maintain equilibrium. Congestion reaches a point at which it constrains further growth in peak-period trips. If road capacity increases, the number of peak-period trips also increases until congestion again limits further traffic growth. The additional travel is called "generated traffic." Generated traffic consists of diverted traffic (trips shifted in time, route and destination), and induced vehicle travel (shifts from other modes, longer trips and

P-047-010

new vehicle trips). Research indicates that generated traffic often fills a significant portion of capacity added to congested urban road.
Litman, Todd, Generated Traffic and Induced Travel, Implications for Transport Planning, Victoria Transport Policy Institute, 8 June 2011,

10. The results of regional travel demand models were manually adjusted by CRC advocates to shift additional traffic to I-5.

P-047-011

The models used to predict traffic are purported in the FEIS to be robust, verifiable, and scientific. But in fact, the Metro travel model is a black box, with the key factors driving predicted outcomes not accessible to outside scrutiny. In addition, the CRC officials concede having manually adjusted the outputs of the model to produce different results.

While the CRC traffic forecasts based their initial estimates on the regional transportation model, they adjusted these estimates to shift some forecast traffic from I-205 to I-5. The authors of the study labeled this manual adjustment "post-processing"—but it simply means that they used their own judgment to select higher values for I-5 than those produced by the regional transportation model. The reasonableness of this adjustment is debatable. The CRC claims that an analysis of 2005 actual traffic data shows that actual traffic on I-5 was underestimated, relative to I-205 by the regional model. The authors made no apparent attempt to see if their adjustment was supported by data in any subsequent year. But each year after 2005, traffic volumes have been proportionately higher on I-205 than I-5, undercutting the stated basis for this "post-processing" adjustment.

According to the report, the effect of the "post-processing" adjustment was to increase traffic volumes assigned to the I-5 bridges by 6 percent over the levels predicted by the regional transportation model without this modification.

The report concedes:

> However, the post processing methodology forecasts less traffic diversion from I-5 to I-205; forecasted 2030 average weekday volumes on the I-5 Bridge are about 6 percent higher with the post-processing methodology than with the regional travel demand models.
> (Columbia River Crossing, 2010b).

P-047-011

"Post processing" is the technique used to improve the results of future traffic volume forecasts by adjusting for the differences in traffic volumes between the observed base year traffic volumes and the travel demand model. Post processing is a comprehensive, systematic approach to account for the fact that the results of a traffic forecasting model, which may be highly accurate on a regional basis, may not be accurate for individual facilities, ramps, or intersections. The procedures used for the CRC project are consistent with the National Cooperative Highway Research Program (NCHRP) Report 255 – Highway Traffic Data for Urbanized Area Project Planning and Design published by the National Academy of Science's Transportation Research Board.

In its report to the Oregon State Treasury, C&M Associates commented on the traffic forecasting process. Its report states "Traffic and revenue were forecasted for a range of options considering the Metro model and a post-processing method utilizing the results of the VISSIM model that considered operational constraints." C&M Associates also explained "All the (sic) three models, the regional Metro model, the VISUM model and the VISSIM microsimulation model were validated." It should be clear that this independent, outside expert found the methods to be appropriate and that accepted techniques were used.

P-047-011

The effect of this adjustment is to understate the amount of diversion that will occur to I-205, even with the relatively high value of time estimates used in the travel demand model.

Despite its technical sounding name "post-processing" really represents a judgment on the part of the CRC to disregard the outputs of the Metro travel demand model, and to manually choose the values for traffic.

11. CRC has failed to disclose visual impacts.

P-047-012

The Columbia River Crossing will have an enormous impact on the views from downtown Vancouver and on Hayden Island. The project will cross the river approximately 70 to 80 feet in the air, and touch down up to a quarter mile away. Almost nothing in the Final Environmental Impact Statement reveals how this massive structure will affect the views and light of human beings standing on the ground anywhere near the structure.

The project's visual impact technical report contains only a handful of computer simulated images of the bridge. Nearly all of them are taken from distant points floating in the air (where no human being will ever actually perceive the structure). For example, Figure 4-8 shows the bridge from a point somewhere along Hayden Island riverfront, several hundred feet east of the bridge, using a "wide angle" perspective that diminishes the perceived height of the structure. Figure 4-12 shows the bridge from a point hovering several hundred feet above downtown Vancouver. Figure 4-13 shows a portion of the structure relatively close up, but again, from the perspective of someone floating somewhere in the air, and not on the ground. Figure 4-13 also depicts the now discarded open-web design, rather than the truss currently proposed.

The decision to present such a limited and artificial set of perspectives represents a conscious attempt on the part of the sponsoring agencies to conceal the project's visual impacts. It is a decades-old gambit: Robert Moses used the same scheme to try to sell a proposed Brooklyn-Battery Bridge in the 1930s. He concealed the fact that the bridge would have obliterated views from the ground (and the lower ten stories of buildings) in Lower Manhattan, by showing the bridge as it might be viewed, in the words of Robert Caro "by a high flying and myopic pigeon." (Caro, Robert. 1976. The Power Broker. Page 464). It was exactly this kind of chicanery that NEPA was designed to prevent.

Under NEPA, the sponsoring agencies have an affirmative responsibility to disclose the impacts the project will have on the environment, including the viewshed. The presented FEIS not only fails to do so, but presents evidence that conceals and distorts the bridge's visual impacts. As such, the FEIS fails to comply with NEPA, and the agencies should

P-047-012

The project has followed current guidance and methods for assessing visual impacts. The visual analysis is described in detail in the CRC Visual and Aesthetics Technical Report. These methods were approved by the local, state, and federal sponsoring agencies. Though there are not many computer simulations in the FEIS, the analysis is based on not just simulations but also plan and profile drawings, photographs, view corridors and view sheds. These all contribute to understanding and considering visual impacts, and they are referenced or included in the FEIS. These means were sufficient for the public and decision makers to select a locally preferred alternative including bridge type. As the project enters final design, there will be continued effort to engage the community in design and aesthetic issues. The project will be charged with maximizing the aesthetic opportunities with the composite truss bridge. This will include developing new simulated views to inform the decisions to be made during final design.

P-047-012

be directed to present a fair and accurate set of renderings disclosing the visual impact as it will be perceived by humans standing on the ground near the structure.

12. Despite making major changes to the project, the CRC did not undertake a supplemental environmental impact statement, as required by NEPA.

P-047-013

The FEIS claims:

> Both agencies concluded from these determinations that these changes and new information would not result in any new significant environmental impacts that were not previously considered in the DEIS. These changes in impacts are described in Appendix O of this FEIS. (FEIS, page 2-86.)

The implication is that the standard is "new significant environmental impacts." But this is not the standard that triggers the need for a supplemental environmental impact statement. The standard is whether there are significant changes to the project.

The project is changed is from the project described in the DEIS in several ways: The footprint on Hayden Island is significantly different. An arterial bridge is being built to Hayden Island. The bridge will be a composite truss, not an open-web. The number of lanes on the bridge will be different. At least one of the garages in downtown Vancouver is proposed to be built partially underground, and not entirely above ground as in the DEIS. The size of the Clark College park and ride lot has been more than doubled. Moreover, because the project is likely to be phased, and there is no certainty as to which phases will actually ever be completed, the project as completed may be very different than the one described in the FEIS, with different environmental impacts.

CRC proponents have implied that the full build FEIS represents the envelope of maximum impacts, and that any smaller project would have lesser impacts, but that is not correct. Some aspects of the project have environmental benefits (tolling, transit), and others have negative environmental effects. Implementing just a portion of the project would likely divert traffic to different locations, with different effects. Prior to issuing a record of decision, DOT should prepare an FEIS that reflects the actual project proposed to be built, and not one that may include many components or features that may never be constructed.

The sponsoring agencies cannot know whether there are "significant impacts" from these changes without undertaking a supplemental environmental impact statement. Moreover,

P-047-013

The test of whether or not a supplemental DEIS is required is not whether or not there have been changes to project. Revisions after the DEIS are common. The CEQ NEPA regulations (40 CFR 1500) describe two basic situations in which agencies are required to prepare a supplemental EIS:

"Agencies shall prepare supplements to either draft or final environmental impact statements if:

- *The agency makes substantial changes in the proposed action that are relevant to environmental concerns;*
- *There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts." (1502.9(c)(1))*

Applying this to FTA and FHWA projects is further clarified in Title 23, Part 771 of the United States Code of Federal Regulations:

(a) … An EIS shall be supplemented whenever the Administration determines that:

(1) Changes to the proposed action would result in significant environmental impacts that were not evaluated in the EIS; or

(2) New information or circumstances relevant to environmental concerns and bearing on the proposed action or its impacts would result in significant environmental impacts not evaluated in the EIS. (23 CFR S 771.130)

The design refinements made after the DEIS were considered and reviewed by FTA and FHWA, consistent with 40 CFR 1502.9(c)(1) and

P-047-013

the objectives of NEPA—giving the public the opportunity to review and comment on this analysis of impacts—is thwarted if the sponsoring agency is allowed to make substantial changes to a project after the DEIS.

The DOT claim that these changes don't cause significant impacts, is in fact, not the appropriate legal standard for determining whether a supplemental EIS should be prepared. The standard, according to the Council on Environmental Quality, is whether the project is substantially different than proposed in the DEIS. CEQ NEPA regulations (40 CFR 1500) describe two basic situations in which agencies are required to prepare a supplemental EIS, one of them is that:

> "Agencies shall prepare supplements to either draft or final environmental impact statements if:
> o The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or ***

Conclusion

P-047-014

The purpose of the National Environmental Policy Act is to assure citizens that all of the important economic, social, and environmental impacts of investment and policy decisions are carefully assessed and fully disclosed *before* the decisions are made. The version of the Final Environmental Impact Statement before you today falls far short of meeting that standard. Because of acknowledged funding uncertainties, and an abject failure to develop a phasing plan that everyone acknowledges will be needed, you really have no idea what project will actually be built, and therefore no way to assess its impacts. The project's traffic projections—which are utterly central to most of the key claims about the project's environmental, energy, social and traffic effects—are not only simply and demonstrably wrong, they are based on a model that the project's sponsors and consultants have acknowledged is incapable of accurately predicting traffic levels on tolled facilities. And despite acknowledging that their projections are wrong, CRC advocates have made essentially no changes to the traffic figures presented years ago in the DEIS. Finally, it is apparent the prospects for a massive $400 million to $500 million earmark for this project, which were always at best speculative, are now virtually impossible. The financial element of the FEIS is not even available in final form, and even then it not really a plan, but rather an "illustrative scenario"—as the project sponsors concede in a candid moment.

The Columbia River Crossing Final Environmental Impact Statement fails to accurately assess these important impacts and disclose their consequences to the people of the region. The U.S. Department of Transportation and its constituent agencies should reject

23 CFR 771.130(a). See discussion on page 2-86 and Appendix O of the FEIS. None of the project refinements made after the DEIS would result in new significant environmental impacts that were not previously evaluated in the DEIS.

P-047-014

Mr. Cortright's conclusion is a summarized restatement of some of the detailed comments in the body of his letter. Please see the responses above to these comments.

P-047-014 this Environmental Impact Statement, refrain from undertaking a Record of Decision, and insist that these issues be addressed.

Very truly yours,



Joseph Cortright

Attached files provided electronically are an integral part of these comments.

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P-047-014

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Supplement to January 28, 2008 "Transportation Planning Requirements and Their Relationship to NEPA Process Completion" February 9, 2011

Background

P-047-014

The Office of Planning, Environment, and Realty issued an informational memorandum on January 28, 2008, explaining the relationship between certain Transportation Planning and Air Quality Conformity regulations and the timing of a final NEPA decision (Record of Decision (ROD), Finding of No Significant Impact (FONSI), or Categorical Exclusion (CE)). However, in clarifying the requirements, additional questions arose from the field after the memorandum's release. In response to the questions, this document clarifies and simplifies information on what transportation planning requirements must be addressed before FHWA can make a final National Environmental Policy Act (NEPA) decision.

A project must meet various planning and NEPA requirements. The procedures of the different requirements, direct the project sponsors to meet all the following:

- All Projects requiring Federal action or that are to be implemented with Federal-aid must come from a fiscally constrained Metropolitan Transportation Plan (MTP) and Transportation Improvement Program (TIP) or from a fiscally constrained Statewide Transportation Planning Program (STIP) [23 CFR Part 450].
- The TIP and STIP shall include a project or a phase of a project, only if full funding can reasonably be anticipated to be available for the period contemplated for completion of the project. [23 U.S.C. § 135(g)(4)(E) and § 134(j)(3)(D)].
- NEPA project approval can only be given when the NEPA documents meet all applicable environmental laws and Executive Orders or reasonable assurances of compliance are provided in accordance with 23 CFR § 771.133.
- In air quality nonattainment and maintenance areas, additional Clean Air Act and EPA requirements apply. [42 U.S.C. § 7506(c) and 40 CFR Part 93]. See Questions 25-27 for more information.

Requirements

The purpose of this document is to identify primary terminology, promote consistency, and to better explain the requirements discussed in this section. The definitions are reflected below in Table 1 and also in the Glossary.

Before the FHWA [1] can sign the final NEPA decision (i.e., ROD, FONSI, or CE), the proposed Project ("Project") as defined in the NEPA document must meet the following specific criteria:

- **For Metropolitan Planning Areas (within a MPO):**
  - The Project or phases of the Project within the time horizon of the MTP must be included in the fiscally constrained MTP, and other phases of the Project and the associated costs beyond the MTP horizon must be referenced in the Plan.

[1] For those States that have programmatic agreements with FHWA, all of the requirements in this section apply.

P-047-014

Table 1. Terms and Definitions

Terms	Definition
Project *(capital P)*	In this document, the term "Project" (*capital P*) refers to a specific proposed facility or other action as defined in the NEPA document (e.g., a bridge or a new highway) and includes every "phase of a Project", from Highway Planning and Research, Preliminary Engineering, Right-Of-Way (ROW) acquisition, through Construction.
project *(small p)*	The term "project" (*small p*) is used here as a reference to a phase of a Project, or a component of such a phase (e.g., bridge piers or highway landscaping related to a Project).
Fiscal Constraint	The MTP, TIP and the STIP have sufficient financial information for demonstration that a Project in the MTP, TIP and STIP can be implemented using committed, available, or reasonably available revenue resources.
Available Funds	Funds derived from existing sources dedicated to or historically used for transportation purposes. For example, apportioned/authorized Federal-aid dollars or toll revenues for the next 2- 4 years. [23 CFR § 450.104]
Committed Funds	Funds that have been dedicated or obligated for transportation purposes. For example, funds obligated for a Federal-aid Project or toll revenues for the next 2 years. [23 CFR § 450.104]
Reasonably Available	The term "reasonably available" in this guidance is synonymous with "reasonably anticipated to be available" and "reasonably expected to be available". Determining whether a future funding source is "reasonably available" requires a judgment decision. Two important considerations in determining whether an assumption is "reasonable" are (a) evidence of review and support of the new revenue assumption by State and local officials and (b) documentation of the rationale and procedural steps to be taken with milestone dates for securing the funds. For example, a new tax for transportation purposes requiring local and/or State legislation and/or support from the Governor is reasonable if there is clear evidence of sufficient support (both governmental and public) to enact the new tax, and a strategy exists for securing those approvals within the time period for implementing specific projects.

- The Project or phase of the Project must be in the fiscally constrained TIP, which includes:
  - At least one subsequent Project phase, or the description of the next Project phase for information purposes only in unusual instances[2].
  - All Federal-aid Projects or Project phases and State/locally funded, regionally significant projects that require a Federal action. [23 CFR § 450.324(d)]
  - Full funding is reasonably available for the completion of all the phase(s) of the Project within the time period anticipated for completion of the Project.[3] [23 CFR § 450.324(h)-(i)]

[2] "Unusual instances" may include anticipated lengthy permitting delays (such as § 404) or likely Project litigation. Please refer to Question 15 for more information.

[3] "The term "phase of a Project" refers to activities such as design, acquisition of right-of-way, and construction. For a discussion of the distinction between "phase of a Project" and "phased Projects", see Question 22. See also the definition of "Project" and "project" in Table 1 and in the Glossary.

P-047-014

- **For Non-metropolitan Areas:**
  - The Project must be consistent with the Long Range Statewide Transportation Plan (also referred to as SLRP).
  - The Project or phase of the Project must be in the fiscally constrained (STIP), which includes:
    - If the completion of the Project is beyond the timeframe of the STIP, the STIP must contain at least one subsequent Project phase, or a description of the next Project phase for informational purposes.
    - All Federal-aid projects or project phases and State/locally funded, regionally significant projects that require a Federal action [23 CFR § 450.216(h)]
    - Full funding is reasonably available for the completion of all phase(s) of the Project. [23 CFR § 450.216(l)-(m)]

Table 2 describes the fiscal constraint actions that must be in place before a final environmental decision is taken (see the attached Questions and Answers for more detail).

Table 2. Fiscal Constraint Requirement before Approving the NEPA Decision

Before a Final Environmental Decision (ROD, FONSI, CE) is approved in:	Fiscal Constraint must be demonstrated by:
Metropolitan Areas	• Entire Project is in the MTP • At least one subsequent phase of the Project is in the TIP (more if within TIP timeframe) • Full funding is reasonably available for the completion of the entire Project
Non-Metropolitan Areas (Outside MPO)	• Project is consistent with the SLRP • At least one subsequent phase of the Project is in the STIP (more if within STIP timeframe) • Full funding is reasonably available for the completion of the entire Project

P-047-014 Table 3 details the Federal planning and environmental requirements that must be met whether or not the environmental process is funded with Federal-aid (see the attached Questions and Answers for more detail).

Table 3. Federal-aid Eligibility and the Associated Environmental /Planning Requirements

If the Environmental process is funded with:	NEPA process can start:	Required actions before the Final Environment Decision can be approved:
Federal Funds	• Corridor/feasibility (Planning and Environment Linkages - PEL) studies: the study does **not** need to be in the fiscally constrained MTP or SLRP and can start at any time, but the study must be in the Unified Planning Work Program (UPWP) or State Planning and Research (SPR) work program when funded with Metropolitan Planning (PL)/SPR funds. If the study is using capital funds (National Highway System (NHS) and Surface Transportation Program (STP), then it needs to be identified in the UPWP or SPR work program, and/or in the TIP or STIP. • Tier I – Environmental Impact Statement (EIS) can start prior to being in the fiscally constrained MTP or SLRP if the scope is for corridor planning or feasibility study and will not include decisions directly resulting in Project implementation activities of any kind (e.g., ROW purchase)	
	• NEPA study must be in the MTP or consistent with the SLRP • NEPA phase of the Project must be in TIP or STIP	• One subsequent phase of Project is in the STIP/TIP
If the Environmental process is funded with:	**Environmental process can start:**	**Required actions before the Final Environment Decision can be approved:**
Non Federal Funds	• After the planning level purpose and need has been identified • Project does **not** need to be in the fiscally constrained MTP Project does **not** need to be fiscally constrained STIP/TIP	• Project is amended into the fiscally constrained MTP • NEPA phase of the Project is amended into the TIP or STIP • One subsequent phase of Project is in the STIP/TIP • Project must meet all NEPA requirements

Questions and Answers

General

P-047-014

1. What is a Project?

Title 23 defines a project as an undertaking to construct a particular portion of a highway, or the particular portion of a highway so constructed or any undertaking eligible for assistance under Title 23. [23 U.S.C. § 101(a)(21)]

In the regulations, 23 CFR § 1.2(b), the term is defined as an undertaking by a State highway department for highway construction, including preliminary engineering, acquisitioning of ROW and actual construction, or any highway planning and research, or for any other work or activity to carry out the provisions of the Federal Laws for the administration of Federal aid for highways.

This document uses "Project" (capital 'P') when referencing a specific undertaking described in the NEPA document (e.g., a bridge replacement), including all phases through construction. The term "project" (small 'p') is used here as a reference to a phase of a Project, or a component of such a phase (e.g., bridge piers or highway landscaping related to a Project) (*see* a more detailed definition in the Glossary).

2. What is a phase of a Project?

A Project phase is defined as separate portion of a Project such as Preliminary Engineering (PE), environment/NEPA, final design, ROW, utility relocation, construction, and/or partial construction (i.e, a component or "project"). [23 CFR § 1.2(b), § 450.216(i) and § 450.324(e)] There may be a project agreement for an individual phase of a Project.

3. What is Fiscal Constraint?

Fiscal constraint means that the MTP, TIP, and STIP include sufficient financial information to demonstrate that Projects in the MTP, TIP, and STIP can be implemented using committed, available, or reasonably available revenue sources, with assurance that the Federally supported transportation system is being adequately operated and maintained. Additionally, Projects in non-attainment and maintenance areas can be included in the first two years of the TIP and STIP only if funds for those Projects are "available" or "committed". [23 CFR § 450.216(m) and § 450.324(i)]

4. What is the NEPA decision?

NEPA decisions occur when the FHWA approves a Project location or selects a Project alternative by signing a ROD or FONSI, or approves a CE after it has determined that the Project has satisfied the planning and environmental requirements. [23 CFR Part 771]

5. What are the planning requirements?

They are the statutory requirements included in 23 U.S.C. § 134 and § 135. The implementing planning regulations are in 23 CFR Part 450. The most applicable sections on this subject can be found in the following:

- 23 CFR § 450.214 - Statewide Transportation Plan
- 23 CFR § 450.216 – Statewide Transportation Improvement Program
- 23 CFR § 450.322 – Metropolitan Transportation Plan

P-047-014

- 23 CFR § 450.324 – Metropolitan Transportation Improvement Program

6. What is the difference between an "action" defined in 23 CFR Part 771, and the term "action" used in the planning regulation?

In 23 CFR Part 771, the term "action" means a Project (highway or transit) proposed for FHWA funding or approval, which may or may not involve a commitment of Federal funds. Further, "Administration action" is approval by the FHWA of the applicant's request for funds for construction, or other activities which may or may not involve a commitment of Federal funds. [23 CFR § 771.107(b)-(c)]

In planning, we have not provided a formal definition for "action"; however, when we refer to Projects "… that require actions by FHWA," the meaning is similar to the definition of "Administration action" as stated above. [23 CFR § 450.216(h)] An action in a planning context is a step taken to advance Projects to implementation whether or not the Projects will be receiving Federal (Title 23 or 49) funds.

7. What are "regionally significant" projects?

Regionally significant projects, which may or may not be funded with Title 23 or 49 funds, are Projects anywhere in the State that have direct impact on a regional transportation system or those Projects that serve regional transportation needs (e.g., major activity centers, major planned developments such as major retail malls, sport complexes, or employment centers, or transportation terminals) and are normally part of the metropolitan or regional transportation network model. For example, these Projects can include actions such as granting access to Interstate Highways or principal arterial system, which require Federal approval, but not necessarily Federal funds. [23 CFR § 450.104]

Fiscal Constraint of Plans, TIPs, and STIPs

8. Is the term "fiscally constrained" different as it applies to the Transportation Plan, STIP, and TIP?

No, the methodology and standards for developing and assessing fiscal constraint for the Transportation Plan, STIP and TIP are the same.

However, the fiscal constraint information in the STIP and TIP should be more refined than that found in the transportation plan (MTP or SLRP). The STIP and TIP require a 4-year fiscal constraint demonstration that indicates the resources committed and/or reasonably expected to be available to carry out the programs. This means that the STIP and TIP must demonstrate and balance their revenue forecast with their expected expenditure forecast (total estimated project costs) for the near term (4-year) period while adequately operating and maintaining the federally supported transportation system. [23 CFR § 450.216(m) and § 450.324(h)]

It is more challenging for the transportation plan to forecast future revenues/costs for a 20-year time frame and to predict the exact nature of funding sources. Although near term MTP financial information is expected to be fairly accurate, the estimates for the outer years (10+ years) of the plan may be less precise. If cost ranges or bands are used (which are allowable in the outer years of the plan), associated revenues should be reasonably expected to be available to cover Project expenditures, including the upper limit of those bands or ranges. Over time, more current financial

P-047-014

data and forecasts can be developed as the MTP is updated every four to five years (or more frequently).

For outer years beyond the timeframe of the TIP and STIP, project sponsors must identify reasonably available source of funding for their Project, which should include a defined funding strategy for the completion of their Projects.

Table 4 provides information on the funding requirements and type of revenue resources that are associated with the planning documents and timeframe.

Table 4. Planning Documents and the Application of the Fiscal Constraint Funding Requirements

Planning Documents	*Project Fiscal Constraint Funding Requirements*		
	Year 1 - Year 2	Year 3 – Year 4	Year 5 – Year 20+
Metropolitan Transportation Plan (MTP)	Committed Funds	Available Funds	Reasonably Available
Statewide Long-range Transportation Plan (SLRP)	Fiscal Constraint is not required for the SLRP, but the State may want to develop, as an option, a financial plan to demonstrate what funds are reasonably available for the State project implementation.		
Transportation Improvement Program (TIP)	Committed Funds	Available Funds	For projects in the TIP and STIP that go beyond the 4 year life of the TIP/STIP, funding for Year 5 and beyond to project completion must be reasonably available.
Statewide Transportation Improvement Program (STIP)	Committed Funds	Available Funds	

9. Does full funding have to be shown in the TIP or STIP, or is it only in the Transportation Plan?

When Projects are programmed in the STIP/TIP, it is with the understanding that full funding can reasonably be anticipated to be available for the Project within the time period contemplated for the completion of the Project. That is, the estimated total cost of an entire Project and how that cost is expected to be covered, must be shown in the STIP or TIP (or in the financial element of an associated transportation plan) through the Project's anticipated year of completion. As allowed in the MTP, reasonable strategies for ensuring the availability of proposed funding sources to cover the estimated total cost of Projects may be identified to demonstrate fiscal constraint in a STIP/TIP. [23 U.S.C. § 135(g)(4)(E), 23 CFR § 450.216(i) and (m), 23 U.S.C. § 134(j)(3)(D) and 23 CFR § 450.324(e) and (i)]

For Projects in the metropolitan planning areas, estimated full Project costs need to be shown in the Metropolitan Transportation Plan. Besides demonstrating currently available and reasonably anticipated revenues to cover those costs, the financial element of a MTP may recommend strategies to ensure the availability of additional funding sources to cover the costs of all Projects and programs described in the MTP. For more discussion on this issue, see Question 13 below.

Non-metropolitan Projects do not need to be specifically identified or have their costs shown in the Long-Range Statewide Transportation Plan, but the Projects do need to be consistent with that plan.

P-047-014

10. Are non-metropolitan Projects exempt from meeting the fiscal constraint requirements?

Although there are no Federal requirements for the SLRP to be fiscally constrained, some States have instituted this as a State requirement. In those States, non-metropolitan Projects and the SLRP should be fiscally constrained as determined by State rules and procedures.

Also, within the environmental analysis for a non-metropolitan Project or corridor study, much of the information concerning cost, Project schedule, source of funds, and commitments by Project sponsor are documented. In most cases, the fiscal constraint demonstration or other financial information is included in the environmental documents.

When rural Projects are programmed, the key is to secure available funding and correctly list it in the fiscally constrained STIP prior to the ROD/FONSI/CE being approved. The Project sponsor should document Project funding and demonstrate fiscal constraint in the financial plan portion of the STIP. The STIP's financial plan is a good practice and should be used to fully document the STIP's fiscal constraint determination. Further, the financial information can subsequently be used in the Financial Plan required for Projects costing $500 million or more.

11. Do corridor or feasibility studies need to comply with the fiscal constraint requirement?

Planning studies must be listed either in the work programs, STIP/TIP, or both. [23 CFR § 420.119(e), 23 CFR § 450.216(g)(2) and (4)]

For those studies funded with NHS, STP, or other Federal-aid, the State should list the cost for these planning studies in the STIP/TIP to meet fiscal constraint requirements, unless the State and the MPO(s) have choosen to exclude them from the STIP/TIP [23 CFR § 450.216(g)(4)].

However, the majority of corridor and feasibility studies are funded with PL or SPR funds. The PL/SPR funded projects should be listed in the UPWP or SPR Work Program as appropriate, but do not need to appear in the STIP. [23 CFR § 450.216(g)(3)]

12. Does the fiscal constraint requirement apply to a Tier I EIS?

A Tier I EIS, a corridor study, or a feasibility study may be initiated prior to any resulting Project being fiscally constrained in the MTP.

A Tier I EIS can be a broad study that is based on early decisions made in the planning process, such as the type of project, the general location, and the major design features. In cases where a Tier I EIS is similar to a major corridor and/or investment study described in 23 CFR § 450.212 and § 450.318, the Tier I ROD may be signed without demonstrating fiscal constraint. In cases where the purpose of the Tier I is only to be a corridor or similar study, there should be a discussion as to why this type of documentation is being used. A Tier I EIS is a NEPA document, and a corridor study is more effectively carried out as a planning document.

When the scope of the Tier I document is clearly defined to include a decision that could result in a Federally-funded action (such as the purchase of ROW), the Project must be listed in the MTP and STIP/TIP, with one subsequent phase listed in the existing STIP/TIP before the Tier I ROD can be signed. The subsequent phase (Tier II) will be the continuation of the NEPA process. In the case of a "No Build" decision, the ROD can be signed without a subsequent phase of work listed. Because of the nature of the Tier I decision making, Tier I Project cost estimation may be broader (e.g., use of banding) than for the regular projects.

P-047-014

As provided in Appendix A of 23 CFR Part 450, the option of linking the transportation planning and NEPA process may be the most appropriate vehicle for corridor/feasibility study rather than the Tier I EIS. Linking Planning and NEPA connects the environmental analysis with the analyses that are used to develop the MTP, STIP/TIP, or planning-level/corridor/subarea/feasibility studies. When done in accordance with Appendix A, these analyses or studies are still within the scope of the planning process and are not subject to the fiscal constraint requirement. [23 CFR § 450.212, § 450.318, and Appendix A]

13. Does the MTP need to include a Project phase that is planned for future years, beyond the 20-year horizon?

Yes, regulations require that the entire Project described in the ROD, FONSI, or CE shall be consistent with the MTP. In the metropolitan areas, only the Project phases within the 20-year time horizon of the MTP must be fiscally constrained, but other phases and associated costs need to be referenced in the plan. [23 CFR § 450.322(f)(10)] Illustrative Projects are not part of the fiscally constrained MTP, and are listed only for informational purposes, until such time as additional resources beyond those identified in the MTP are to become available. [23 CFR § 450.322(f)(10)(vii)]

14. What assurance is needed to determine if a Project meets fiscal constraint?

Within the NEPA documentation, a discussion should be included on the planning information that was used to develop the Project. It should provide information about the Project and its relationship with the current MTP and TIP, including corridor or feasibility study information, a comparison of design concept and scope, and specific references in the current transportation plan and the TIP to assist in identifying the Project.

15. If the majority of the Project implementation is beyond the four year time frame of the STIP/TIP, does the full Project cost information still need to be in the STIP/TIP?

For Projects scheduled to start within the existing STIP/TIP years, if the majority of the work will be conducted in years beyond the STIP/TIP time frame, only the Project costs within the next four years must be in the STIP/TIP. [23 CFR § 450.216(m), § 450.324(e)] For portions of the Project that are beyond the STIP/TIP years, the Project must be in the fiscally constrained MTP and the estimated total Project cost must be described within the financial element of the MTP, STIP, and/or applicable TIP. For more information about this, please review Questions 8, 9, and 10. [23 CFR § 450.216(m), § 450.322(f), § 450.324(h)-(i)]

16. Can the environmental decision be signed if the next phase of the Project (e.g. PE, final design, ROW, utility relocation, construction, or construction phase) is beyond the horizon of the STIP/TIP and is not included in the STIP?

Generally at least one subsequent phase of the Project must be included in the approved STIP/TIP before the FHWA can sign the ROD or FONSI, or approve the CE. However, in the unusual instances where no subsequent phase of the Project falls within the STIP/TIP timeframe, then a description of the Project must be included in the STIP/TIP for informational purposes and identified as being beyond the horizon of the STIP/TIP. "Unusual instances" refers to situations where an agency can expect lengthy Project delays after the final NEPA decision.

P-047-014

17. What happens to a Project when the revenue situation changes and the Project may or may not be in the fiscally constrained Metropolitan Transportation Plan?

In cases where the FHWA finds a MTP to be fiscally constrained and a revenue source is subsequently removed or substantially reduced (i.e., by legislative or administrative actions), the FHWA will not withdraw the original determination of fiscal constraint; however, in such cases, the FHWA will not act on an updated or amended MTP until such time that it reflects the changed revenue situation.

However, if the MPO expects that the revenue situation has changed and projects identified in the plan cannot be financially supported to completion, we recommend the MPO revise its revenue numbers and amend the plan.

Further, when the MPO updates its MTP, we suggest the MPO request that project sponsors revisit their current projects that are in the existing fiscally constrained plan to ensure that the Project description (e.g. project scope, location, and purpose and need) and associated cost estimates are still valid and that funding resources are still available for the completion of the Project. Also, Project sponsors should advise and update the MPO with current information for the MTP if their Project cost estimates have been revised due to NEPA document re-evaluation or a supplemental EIS.

18. Can the ROD/FONSI/CE be approved when the funding in the environmental documentation does not match what is in the MTP or STIP/TIP?

No. As the final environmental review is completed, it is important to ensure that the cost estimates are consistent with costs described in the MTP and STIP/TIP. If there is a significant difference between the Project cost estimates in the final environmental document compared to the MTP and/or STIP/TIP, this potentially may impact the overall fiscal constraint demonstration and the mix of future projects selected for funding in the MTP and STIP/TIP if the Project is underfunded. In this case, a plan and/or STIP/TIP amendment is necessary prior to the final NEPA decision.

Note: We recommend that environmental documentation and planning documents use Year of Expenditure (YOE) dollars for the cost estimates. *See* Question 21.

19. Does the Long-Range Statewide Transportation Plan (SLRP) have to be fiscally constrained?

No. The planning regulations do not require the Long-Range Statewide Transportation Plan to be fiscally constrained, although some States have found it beneficial to include a statewide financial plan. The financial plan can show how longer-range statewide transportation projects can be implemented, indicate the resources that are reasonably available (i.e., reasonably available public and private funds), and identify revenue shortfalls and potential financial strategies to fund the needed projects and programs. [23 CFR § 450.214(l)]

20. How does a State monitor all the non-metropolitan Major Projects and ensure that there is adequate funding in the future years in absence of a statewide financial plan?

A Project with a total estimated cost of $500 million or more that is receiving Federal financial assistance is designated as a Major Project. Section 106(h)(3) of Title 23 states a Finance Plan shall be produced for a Major Project and should demonstrate the Project's fiscal constraint and also document all the existing on-going future commitments such as required for Major Projects. Since most Major Projects are multi-year projects, the Major Project information will appear in the STIP and will be carried over to future STIP(s). This information is not only critical to ensure that the current STIP meets the fiscal constraint requirement, but also to ascertain that there is adequate

P-047-014

future funding to complete the Major Project. Furthermore, the financial plan for the STIP could capture the anticipated funding commitments for all Major Projects in one document.

In addition, a Project with a total cost between $100 million and $500 million, while not classified as Major Project, requires the preparation of Finance Plans that must be made available to FHWA upon request. [23 U.S.C. § 106(i)]

Year of Expenditure (YOE) Funds

21. What is Year of Expenditure (YOE)?

Year of Expenditure dollars are dollars that are adjusted for inflation from the present time to the expected year of construction. By using YOE dollars, this ensures that the more accurate cost estimates are used in planning, programming and implementation of the Project.

The planning regulations require that revenue and cost estimates in the MTP, STIP, and TIP, must use inflation or growth rate(s) to reflect "year of expenditure dollars," based on reasonable financial principles and information, developed cooperatively by the State, MPOs, and public transportation operators. [23 CFR § 450.216(l), § 450.322 (f)(10)(iv), and § 450.324(h)] Year of expenditure cost estimates should also be used in NEPA documentation.

In addition, the Major Project Guidance requires financial information associated with the Project (NEPA phase through final construction) must be included in the Major Project financial plan, regardless of the source of funding. These costs must be expressed in YOE dollars and estimated using a risk based approach.

See Major Project Financial Guidance:
http://www.fhwa.dot.gov/ipd/project_delivery/resources/financial_plans/guidance.htm.

Environmental Studies and Planning Process

22. One of the examples (Colorado: I-25) in the January 28, 2008, memorandum described a phased NEPA decision-making process, sometimes described as "phased RODs/FONSIs". Is this allowed as a mechanism to break-up a larger Project to deal with limited available Project funding and fiscal constraint or for political reasons?

A Project that will be built over time with multiple work phases based on one NEPA decision document is not a phased ROD/FONSI. it is a *phased Project.* A phased ROD/FONSI occurs when there is one NEPA evaluation document but from that evaluation document, a NEPA decision document (ROD/FONSI) is issued for only a section or portion of the proposed Project (e.g., construction of a two mile section of a proposed 10 mile long highway).

The FHWA acknowledges some Projects that are currently in the midst of a lengthy NEPA process anticipate use of phased decision making. It is expected that these Projects will proceed, but the FHWA expects the future use of the phased ROD/FONSI concept will be limited to situations where there are unanticipated changes in circumstances after the planning process, or where the phased nature of the decision making on a corridor or project is fully discussed and defined in the context of the NEPA study on which the phased decision will be based (including agency and public

P-047-014

involvement). This approach should be considered only after consultation with both the Office of Project Development and Environmental Review and the Office of Chief Counsel.

23. How should the planning process be used to determine Projects, needs, and priorities?

Statewide and Metropolitan transportation planning should be the foundation for highway and transit Project decisions, emphasizing public involvement, and consideration of environmental and other factors. The planning process identifies the transportation system needs and the Projects that will address these needs. With the fiscal constraint requirement, the planning process can recommend and advance only those Projects that a State/MPO/local agency can afford to implement.

In the overall planning process, corridor, subarea, or other focused planning studies should clearly identify the purpose and need of proposed Projects and weed out those that are not environmentally and/or financially feasible unless new or additional revenue sources are identified. Transportation agencies need to consider methods to improve linkages between planning and environmental issues in order to focus subsequent NEPA review on a more limited list of Project options. In this manner, agencies can better evaluate Project feasibility and costs before launching into what can be a long and expensive NEPA review process.

24. Does starting the environmental analysis process for a Project (even with State or local funds) ensure future Federal-aid funding?

No, starting the environmental analysis process does not ensure future Federal funding commitments. If however, a Project sponsor wants to advance a Project that is not in the fiscally constrained plan or STIP/TIP, it may do so with its own funds. In this case, Federal funds are not to be used to conduct the environmental analysis process. The project sponsor assumes the risk that the Project may not be eligible for or receive Federal funds, if later requested. By not being part of the broader transportation planning process, this Project still has to compete for the available limited Federal funds that have not been assigned to other Projects. A final NEPA decision for the Project will not be made until all appropriate elements listed in the "Requirements" section" of this document have been met.

Nonattainment and Maintenance Areas

25. What Projects are subject to the project level transportation conformity requirements?

Project level conformity applies to nonexempt (those projects not listed in 40 CFR § 93.126) FHWA/FTA projects. For purposes of conformity, an FHWA/FTA project is any highway or transit project which is proposed to receive funding assistance and approval through the Federal Aid Highway program or the Federal mass transit program, or requires FHWA or FTA approval for some aspect of the project, such as connection to an interstate highway or deviation from applicable design standards on the interstate system.

26. What are the transportation conformity requirements that must be addressed before the NEPA decision can be signed?

Before the NEPA decision (ROD, FONSI, or CE) can be signed by the FHWA, regulations require that a project level conformity determination be made for all nonexempt FHWA/FTA projects that are subject to transportation conformity. [40 CFR§ 93.104(d)]

P-047-014

In the metropolitan areas, conformity for a nonexempt FHWA/FTA project can be demonstrated if the Project is part of a conforming metropolitan transportation plan and TIP, and meets all the project level conformity requirements. [40 CFR § 93.104(d) and § 93.109]

For a nonexempt FHWA/FTA project in a "donut" area (part of the nonattainment and maintenance area that lies outside of the metropolitan planning area boundary), the Project must be included in the regional emissions analysis that supported the conformity determination of the associated metropolitan transportation plan and TIP and meet all applicable project level conformity requirements. [40 CFR § 93.109]

In an isolated rural non-attainment and maintenance area, Project level conformity must meet all the requirements in 40 CFR § 93.109(l) prior to the FHWA signing or approving the ROD, FONSI, or CE.

For more information, please see http://www.fhwa.dot.gov/environment/conformity/feis_rod.htm.

27. How do transportation conformity requirements apply in tiered EIS documents?

The transportation conformity regulation (40 CFR § 93.126) states that "specific activities that do not involve or lead directly to construction, such as planning and technical studies" are exempt from the requirement to determine conformity. Therefore, project-level conformity requirements, including any relevant hot-spot analyses, do not apply for the Tier 1 EIS. However, should a named Tier 1 analysis transition into a Tier 2 product and the project sponsor decides to seek a decision leading to a selected alignment, with the ROD allowing acquisition of right of way and authorization of final design, P,S &E, etc., then project level conformity would be required.

In the Tier 2 EIS, the preferred alternative would be selected from the shorter list of alternatives identified in the Tier 1 EIS. All requirements for project-level conformity apply for the preferred alternative selected in the Tier 2 EIS. Project-level conformity must be determined before the Tier 2 ROD can be signed.

Major Projects: Phased Construction and Operational Independence

28. For a Major Project, if the Project phases are not identified in the approved environmental decision, can the state decide at a later date to construct the Major Project in phases?

Yes, on a case-by-case basis, the scope of work described by the ROD, FONSI, or CE can be divided into a phased Project that corresponds to operationally independent increments of work (as described in question below and Question 22 above) which will be built non-concurrently. The FHWA Division Office will need to consult with the FHWA Project Delivery Team (formerly the Major Projects Team) prior to making this determination. In cases where the scope of the work is divided into a phased Project after the NEPA decision, Major Project requirements will apply only to the individual Projects meeting the Major Project designation requirements.

29. What requirements need to be met before determination of operational independence and non-concurrent construction is approved by the FHWA (HQ and Division)?

"Operational independence" is a project management and financial planning concept that applies to Projects that are subject to 23 U.S.C. § 106(h). An operationally independent phase of the Project is a component of the overall Project that can be built and can function as a viable transportation facility even if the rest of the Project described in the environmental document is never built.

P-047-014

Multiple contracts developed for bidding by the Owner for contract administration purposes or due to funding shortfalls are generally not considered to be operationally independent.

Operational Independence is further defined and discussed in the guidance on operational independence and non-concurrent construction[4] and in FHWA Major Project guidance[5].

Note that "operational independence" is not the same as NEPA "independent utility" and the two concepts are used for different purposes. In 23 CFR § 771.111(f), the FHWA's assessment of independent utility and logical termini occurs during the NEPA review in order to ensure a meaningful evaluation of alternatives and to avoid commitments to transportation improvements before they are fully evaluated. This includes considering whether the Project will result in a usable facility and will be a reasonable expenditure even if no additional improvements in the area are made. Given the extensive record of such NEPA determinations, distinguishing the Major Project Review requirements from the environmental review requirements helps avoid unintended consequences in implementing 23 U.S.C. § 106(h).

FHWA Division Office's Roles and Responsibilities

30. Whose job is it to make sure that all planning requirements are in place before final NEPA decision is made?

Under the Federal-aid program, it is the role of the FHWA Division Office to help the State, MPO(s), and Project sponsors navigate through and meet these requirements. The Division Office should have all environmental and planning information at hand. The planners and environmental specialists should work closely and develop a process or system that can help track all the relevant information as the environmental documents are being completed.

31. Why is fiscal constraint requirement critical now?

Fiscal constraint has been a critical part of the planning and project development processes since the passage of ISTEA in 1991. In today's limited fiscal environment, it is critical that we provide due diligence as to how public funds are expended. When making NEPA decisions, including the decisions whether to initiate the NEPA process, it is incumbent on the Division Office to consider the broader context of fiscal stewardship. Fiscal stewardship is a critical role and responsibility for the FHWA and is engrained throughout the transportation decision making process: from fiscal constraint requirements in the transportation planning process, to reasonable cost estimates of alternatives in project development and the NEPA process, to financial plans and Major Project requirements during design and construction.

The FHWA must actively encourage transparency, consistency, and reasonableness with regard to planned expenditures of public resources, and attempt to ensure that consistent messages are being provided throughout the planning, project development, NEPA, design, construction, operation, and environmental mitigation follow-up processes.

[4] http://www.fhwa.dot.gov/ipd/project_delivery/resources/operational_construction/memo_operational_independence.htm
[5] http://www.fhwa.dot.gov/ipd/project_delivery/resources/general/mpg_memo.htm

P-047-014

32. . How do we ensure that environmental studies are for real and viable projects?

An effective transportation planning process requires the MPOs and the States to make the appropriate decisions that will benefit the transportation system and the region. A robust planning process that includes planning/corridor/subarea/feasibility studies, environmental analysis, and financial planning will help project sponsors, the MPOs, and the States to determine if completing all of the proposed Projects is achievable, given the anticipated revenues and the relative priorities of these Projects. The planning process, when appropriately used as a screening mechanism, ensures that only those "viable" Projects that meet funding and priority requirements will advance. These "viable Projects" will be limited in number and with the smaller number of Project commitments, the FHWA can better leverage its staff resources in reviewing and providing oversight of the NEPA process.

P-047-014

Appendix A

STATUTORY AND REGULATORY REQUREMENTS FOR FISCAL CONSTRAINT / FINANCIAL PLANNING IN THE FEDERAL TRANSPORTATION PLANNING PROCESS

Type of Plan/Program/ Project	Fiscal Constraint requirement?	Financial Plan Required?	Update Schedule/Notes
Metropolitan Transportation Plan	Yes	Yes	Plans must have at least a 20-year time horizon and be updated every 5 years in attainment areas and every 4 years in non-attainment and maintenance areas. Also, for nonattainment and maintenance areas, the financial plan shall address the specific financial strategies required to ensure the implementation of TCMs in the applicable SIP.
Metropolitan Transportation Improvement Programs (TIPs)	*Yes – must be fiscally constrained by year	Yes	Must be updated at least every four years; MPO must develop Annual Listing of Obligated Projects consistent with the categories identified in the TIP. Also, in nonattainment or maintenance areas, projects included for the first 2 years of the TIP shall be limited to those for which funds are available or committed.
Statewide Transportation Improvement Programs (STIP)	Yes – must be fiscally constrained by year	Not mandatory, but if not included, financial issues should be addressed in some other way	Not less than 4-year time horizon; must be updated at least every four years; funding shown in STIP must be consistent with funding shown in the TIPs for the metro portions of the statewide program. Also, in nonattainment or maintenance areas, projects included for the first 2 years of the STIP shall be limited to those for which funds are available or committed.
Statewide Transportation Plan	Not required	Not required, but must reference or contain information on the availability of financial and other resources needed to carry out the plan	No mandatory update schedule. Not less than 20-year horizon.
FHWA Major projects (>$500 Million cost)	Yes, near term phases must be part of fiscally-constrained TIP and STIP	Yes. NOTE: this is a project-specific financial plan that is different than the region's financial Plan for the Long Range Transportation Plan	Single project plan.
FTA Major Capital Investments (Mainly New Starts)	Yes, must be in fiscally constrained TIP and STIP	Yes	Project level plan. Projects entering the FTA New Starts process also require Alternatives Analysis pursuant to 49 U.S.C. §5309(e)(2).

16

Glossary

P-047-014

Air Quality Attainment areas
An area considered to have air quality that meets or exceeds the U.S. Environmental Protection Agency (EPA) health standards used in the Clean Air Act. An area may be an attainment area for one pollutant and a nonattainment area for others.

Air Quality Maintenance areas
Any geographic region of the United States previously designated nonattainment pursuant to the CAA Amendments of 1990 and subsequently re-designated to attainment subject to the requirement to develop a maintenance plan under section 175A of the CAA, as amended.

Air Quality Non-attainment area
A geographic region of the United States that the EPA has designated as not meeting a given national ambient air quality standard (NAAQS).

Banding
For the outer years (i.e., beyond the first 10 years) of the MTP, the financial plan may reflect aggregate cost ranges/cost bands, as long as the future funding source(s) is reasonably expected to be available.

Categorical Exclusion (CE)
A Project may be categorically excluded from a detailed environmental analysis in an Environmental Assessment (EA) or Environmental Impact Statement (EIS) if it meets certain criteria that a Federal agency has previously determined as having no significant environmental impact and does not involve unusual circumstances that require evaluation. Types of actions typically considered by FHWA to be categorically excluded are described in 23 CFR § 771.117.

Conformity
A process to assess the consistency of any transportation plan, program or project with State air quality implementation plans. The transportation conformity process is defined by the Clean Air Act as amended and implemented by 40 CFR Part 51 and Part 93.

Donut area
Geographic areas outside a metropolitan planning area boundary, but inside the boundary of a nonattainment or maintenance area that contains any part of a metropolitan area(s). These areas are not isolated rural nonattainment and maintenance areas.

Final NEPA Decision
A final NEPA decision is documented in a ROD, FONSI, or CE determination.

Finding of No Significant Impact (FONSI)
A Federal agency prepares a written environmental assessment (EA) to determine whether or not a project would have significant impacts on the environment. If the answer is no, the agency issues a finding of no significant impact (FONSI). The FONSI may address measures which an agency will take to reduce (mitigate) potentially significant impacts.

Independent Utility
Project must be usable and be a reasonable expenditure even if no additional improvements in the area are made , as described in 23 CFR § 771.111(f).

Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA)

P-047-014

ISTEA (Public Law 102-240) is a Federal law that made major changes to transportation planning and policy as embodied in Title 23 of the United Stated Code.

Isolated rural nonattainment and maintenance areas

Areas that do not contain or are not part of any metropolitan planning area as designated under the transportation planning regulations. Isolated rural areas do not have federally-required metropolitan transportation plans or TIPs and do not have Projects that are part of the emissions analysis of any MPO's metropolitan transportation plan or TIP. Projects in such areas are instead included in statewide transportation improvement programs. These areas are not donut areas.

Long-range Plan (LRP)

This is a 20-year horizon plan that identifies facilities that should function as an integrated transportation system, and are developed pursuant to Title 23 and 49, U.S.C. (United States Code). It gives emphasis to those facilities that serve important national and regional transportation functions, and includes a financial plan that demonstrates how the long-range plan can be implemented. Both the SLRP and MTP are examples of long-range plans.

Long-Range Statewide Transportation Plan (also referred to as SLRP)

Long-range Statewide Transportation Plan means the official, statewide, multimodal, transportation plan covering a period of no less than 20 years developed through the statewide transportation planning process.

Major Project

Federal-aid Project funded under Title 23 with an estimated total cost of $500 Million or more. Major Projects are requires to submit a project management plan and an annual financial plan to FHWA for review.

Metropolitan Planning Organization (MPO)

The organizational entity designated by Federal law with lead responsibility for developing transportation plans and programs for urbanized areas of 50,000 or more in population.

Metropolitan Transportation Plan (MTP)

This is the official multimodal transportation plan addressing no less than a 20-year planning horizon that is developed, adopted, and updated by the MPO through the metropolitan transportation planning process.

NEPA and NEPA Process

The National Environmental Policy Act (NEPA) (42 U.S.C. § 4321 et seq.) requires Federal agencies to integrate environmental values into their decision making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. There are three NEPA classes of action: categorical exclusions (CEs), which may apply if an action meets established criteria and has no significant environmental impacts individually or cumulatively; environmental impact statements (EISs), which are required for actions with significant environmental impacts; and environmental assessments (EAs), which are used to evaluate an action when the significance of environmental impacts is not certain. An EA may result in a finding of no significant impact (FONSI) if analysis shows there are no significant environmental impacts or the action includes mitigation for potentially significant impacts, or an EA may result in the preparation of an EIS.

Non-metropolitan Area

The term "non-metropolitan areas" means all areas of a State that are outside the MPO planning boundary areas.

P-047-014

Operational Independence

This is a term unique to Major Project Guidance, which describes conditions under which a component of the overall Major Project may proceed if the component can be built and can function as a viable transportation facility even if the rest of the Project described in the environmental document is never built.

Project

A Project is an undertaking by a State highway department or local agency for highway, transit, or other action eligible for Federal funding or requiring Federal approval. In this document, the term "Project" (capital 'P') refers to a specific proposed facility or other action as defined in the NEPA document and includes every "phase of a Project", such as preliminary engineering, acquisition of rights-of-way and actual construction, unless otherwise stated. The term "project" (small 'p') is used here as a reference to a phase of a Project, or a component of such a phase (e.g., bridge piers or highway landscaping related to a Project).

Record of Decision (ROD)

A ROD presents the environmental decision by the Federal agency for a Project, the basis for the decision, identifies the selected alternative, and summarizes any mitigation measures that will be incorporated in the Project. The ROD can only be signed once the Project final EIS meets all the requirements in 23 CFR Part 771.

Regional Transportation Plan (RTP)

Some states refer to their MTP as RTP. They are the same document.

Statewide Transportation Improvement Program (STIP)

This is a statewide prioritized listing/program of transportation projects covering a period of four years that is consistent with the long-range statewide transportation plan, metropolitan transportation plans, and TIPs, and required for Projects to be eligible for funding under title 23 U.S.C. and title 49 U.S.C. Chapter 53.

Transportation Improvement Program (TIP)

Also known as a transportation program, a TIP is a prioritized listing/program of transportation projects covering a period of four years that is developed and formally adopted by an MPO as transportation plan, and required for Projects to be eligible for funding under title 23 U.S.C. and title 49 U.S.C. Chapter 53.

Year of Expenditure (YOE)

Year of expenditure dollars are dollars that are already adjusted for inflation. For example, if two identical items each have a current value of $1,000, it may in fact, cost $1,000 to purchase one of them in the first year of a Project, while it is estimated to cost $1,200 to purchase the other in the fourth year of a Project.

From: james.saxton@dot.gov
To: Wills, Heather; Ted.Uyeno@dot.gov; Gehrke, Linda; McAvoy, John
Cc: Heilman, Jeff
Subject: RE: BRP recommendations and NEPA
Date: Monday, March 14, 2011 2:57:08 PM
Attachments: CRC supplemental evaluations and BRP 2.3.14.11 ss suggested edits.docx

P-047-014

Heather,

FTA has made some suggested edits. Overall, the paper is reflective of previous discussions. Please keep in mind that while we anticipate that a re-eval appears sufficient for the composite truss based on the information we have at this time, without the current benefit of the re-eval, we cannot commit that a re-eval is all that will be needed. Thanks for the opportunity to review.

Steve

From: Wills, Heather [mailto:WillsH@columbiarivercrossing.com]
Sent: Monday, March 14, 2011 10:45 AM
To: Saxton, James (FTA); Uyeno, Ted (FTA); Gehrke, Linda (FTA); McAvoy, John
Cc: Heilman, Jeff
Subject: BRP recommendations and NEPA
Importance: High

Good morning!

Attached is a draft document that outlines the implications of the BRP recommendation related to NEPA, and specifically the need to do a supplemental EIS. We have outlined that a composite truss bridge type on the same alignment would not require a supplemental EIS because any impacts have already been disclosed in the DEIS. Further, we outline why the high level bridges would likely require an SEIS based on the environmental impacts that have not been disclosed.

This weekend I went back and reviewed all the screening documents to see how we documented the rationale for dismissing the high level bridges, and it was because they would cause safety impacts to aviation. The high bridges were not dismissed because of permitting issues, which I think is an important point. Furthermore, the screening criteria, as well as the dismissed alternatives, were adopted by the task force, InterCEP and discussed with the public in various venues.

We would greatly appreciate your review of the attached document that comprehensively discusses all of these issues. It would be helpful to have your feedback by tomorrow if possible. I know that is quick. Just let me know what you are able to do.

Thanks!
Heather

Heather Wills | Environmental Manager
p. 360.816.2199
willsh@columbiarivercrossing.org

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

P-047-014

Implications of the BRP report on the NEPA process

This paper addresses the key questions regarding the BRP report and its effect on the NEPA process:

1. ~~Does~~ Do the new information and recommendations in the BRP report~~,~~ warrant the preparation of a supplemental DEIS (SDEIS)?
2. Would a SDEIS be required to advance either the cable-stayed or tied arch bridge to an FEIS?
3. Would a SDEIS be required to advance the composite truss bridge to an FEIS?

Based on NEPA regulations, case law, and conversations with the federal lead agencies, the consideration of the information and recommendations in the BERP report do not require preparation of an SDEIS. Similarly an SDEIS is not needed to screen out the high level bridges and advance the composite truss to an FEIS. However, an SDEIS would likely be required before one of the high-level bridges could be included in an FEIS or ROD. The difference between the process required for the different bridge types hinges primarily on the variance in impacts. The high level bridges would result in new, likely significant impacts that were not evaluated for the range of alternatives in the DEIS. The composite truss bridge type is nearly identical in character and in all issues bearing on environmental impacts to one or more of the alternatives evaluated in the DEIS. Furthermore, the composite truss would be the environmentally preferable option for the river crossing.

NEPA Regulations

CEQ NEPA regulations as well as FHWA and FTA NEPA regulations are clear that a supplemental EIS is not required merely because there is new information or new ideas. The expectation is that a DEIS cover a reasonable range of alternatives. At any point in the NEPA process, any person or group can suggest new ideas or provide new information, and the lead agencies should consider that information. However, that such ideas or information arise is not an inherent cause for preparing a supplemental EIS. A supplemental EIS is required only if the proposed action would result in significant environmental impacts that were not evaluated in the previous EIS (the new impacts could be the result of changes in the project itself or through changes in environmental information relevant to the proposed action's impacts). The key issue is that, in this situation, a SDEIS is required only if the proposed action itself changes, or environmental circumstances change, such that the proposed action would have new, significant impacts not evaluated in a previous EIS.

If the CRC proposed action for the river crossing bridge type is revised to the cable-stayed design, there would be new, potentially significant impacts not evaluated in the DEIS. If the proposed action for the river crossing is revised to the composite truss, there would be no new significant impacts that were not previously evaluated in the DEIS.

CEQ NEPA regulations (40 CFR 1500) describe two basic situations in which agencies are required to prepare a supplemental EIS:

- *"Agencies shall prepare supplements to either draft or final environmental impact statements if:*
  - *The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or*

P-047-014

- *There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts."* (1502.9(c)(1))

This aspect of the CEQ regulations is essentially mirrored and supplemented in the FHWA and FTA NEPA regulations. The following is from Title 23, Part 771 of the United States Code of Federal Regulations. This regulation prescribes the policies and procedures of the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) for implementing the National Environmental Policy Act.

(a) A draft EIS, final EIS, or supplemental EIS may be supplemented at any time. An EIS shall be supplemented whenever the Administration determines that:

(1) Changes to the proposed action would result in significant environmental impacts that were not evaluated in the EIS; or

(2) New information or circumstances relevant to environmental concerns and bearing on the proposed action or its impacts would result in significant environmental impacts not evaluated in the EIS. (23 CFR S 771.130)

The following describes how these parallel elements of the CEQ and the FTA/FHWA NEPA Regulations regarding supplemental EISs relate to the current situation for the CRC project.

When the Proposed Action Changes

The following is the language from CEQ and FTA/FHWA NEPA regulations regarding when changes in the proposed action would require preparation of a supplemental EIS. Agencies are to prepare a supplemental if:

- *The agency makes substantial changes in the proposed action that are relevant to environmental concerns* (40 CFR1502.9(c)(1))
- *Changes to the proposed action would result in significant environmental impacts that were not evaluated in the EIS* (23 CFR 771. 130 (a)(1))

As noted previously, the mere presence of new design or project ideas does not trigger the need for an SDEIS. There must be actual changes to the proposed action, and those changes must result in new, significant environmental impacts not previously evaluated in an EIS. Merely considering new information and considering new ideas does not constitute a change in the proposed action.

If the composite truss is advanced there would be no substantial changes in the proposed action relevant to environmental concerns; there would be no significant environmental impacts from the proposed action that were not evaluated in the DEIS. Environmental impacts would be essentially the same as those evaluated for the open web box and well within the scope of impacts evaluated and disclosed in the DEIS. The composite truss bridge would not require an SDEIS before advancing to an FEIS. The current process to gather public and agency input, evaluate impacts and conduct a "re-evaluation" has indicated that the composite truss design could advance directly to an FEIS.

For the high-level bridges, however, because of their additional and potentially significant environmental impacts that were not evaluated in the DEIS, an SDEIS would likely be required

P-047-014

before they could advance to an FEIS and ROD. The primary concern is that these bridge types were evaluated by the project (with public and agency input) in 2006-07 and were dropped from further consideration, primarily because of aviation-related concerns. That evaluation and conclusion were communicated to the public and agencies in 2007 and these bridge types were referenced in the DEIS as options that had been evaluated but were no longer being considered.

To change that conclusion at this point in time would introduce potentially significant impacts and regulatory issues that were not evaluated in the DEIS, including substantial above-deck structures on the river crossing, substantial intrusion into Pearson Field airspace, the likelihood of a hazard determination from FAA, impacts on airfield operations and safety, and potential liability associated with any such impacts. Changing to this bridge type introduces new, potentially significant issues that were not evaluated or proposed in the DEIS. Bridges that would have these kinds of impacts were eliminated before the DEIS was published.

In addition, the cable-stayed or tied arch bridge would have greater impacts to threatened and endangered species due to the need for more in-water construction. They have fewer but larger bridge pier foundations than the composite truss, thus requiring 10 - 20% more temporary pile driving than the composite truss bridge and potentially the need for additional, larger coffer dams. The cable-stayed or tied arch bridge would also have three to four more acres of impervious surface area and therefore more storm water runoff, requiring more upland area to treat the runoff.

When New Information Arises

The following are the parallel excerpts from the CEQ and FTA/FHWA NEPA regulations regarding when new information or new circumstances require preparation of a supplemental EIS. Agencies are to prepare supplements if:

- *There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.* (40 CFR 1502.9(c)(1))
- *New information or circumstances relevant to environmental concerns and bearing on the proposed action or its impacts would result in significant environmental impacts not evaluated in the EIS.* (23 CFR 771. 130 (a)(1))

These conditions clearly do not indicate that the mere presence of new information, even significant information, requires the preparation of a supplemental EIS. The new information has to both significant and relevant to the environmental concerns of the proposed action or its impacts. As 23 CFR clarifies, the new information has to result in significant environmental impacts from the proposed action not evaluated in the EIS. This condition refers to the situation in which the proposed action itself may not have changed since the DEIS, but new information, for example regarding environmental conditions, has come to light such that significant environmental impacts not previously evaluated in the existing DEIS, will now result from the proposed action.

The BERP report clearly provides some new information that was not available during the DEIS. The BERP report recommends not advancing the open web design and instead recommends that the project advance either the composite truss, cable-stayed or tied arch bridge type. The BERP made these recommendations based on new analysis they conducted regarding cost and

P-047-014

schedule risks; they did not evaluate environment impacts and their recommendations were not based on environmental concerns.

The BERP report also provides information regarding aviation safety and FAA regulatory standards. However, this information is not fundamentally different from what was used in 2006-7 to evaluate conceptual bridge types (low, mid, and high level bridges). That evaluation led the project and CRC Task Force to drop "high-level bridges" (including cable-stayed and tied arch designs) from further consideration. The "Draft Components Step A Screening Report" (CRC 2007) documents the criteria that were used to evaluate and either advance or drop bridge options in that phase of project development.

As documented in the 2007 report, this screening criterion was based on impacts to safety, including aviation, traffic and navigation safety. The airspace-related safety question was based on encroachment; it did not rely on the outcome of any reviews or approvals from FAA. Rather, the screening criteria were built off of the project's Problem Statement and the Purpose and Need, and they were adopted by the 39-member CRC Task Force. The aviation safety criterion stated that in order for a component to be advanced for further consideration, it:

- *Must not create a significant new encroachment into the Pearson Airpark airspace, and*
- *Must not encroach into PDX airspace.* (p. 3-16)

The 2007 report notes that all of the high level bridges failed the first part of this criterion and some might also fail the second part. Failing either part of this criterion was rationale for dropping that option from further consideration. Through this evaluation and following input from the public and recommendations from the Task Force, high level bridges were dropped from further consideration.

The 2010 BERP study and recommendations do not change this basic finding from the 2007 analysis and report – both the cable-stayed and tied arch bridge designs recommended by the BERP would fail to meet the first half of this adopted criterion. The BRP suggested that impacts on the airspace might be allowed by FAA, but that is irrelevant to the adopted criterion that eliminated these bridge types in 2007. While there is no prohibition against changing screening criteria at this time, nothing in the BERP report provides new information that would reverse or negate the fundamental rationale upon which the 2007 criteria were based. Therefore, the 2010 BERP report does not provide significant new information regarding aviation issues or the reasoning used to eliminate high level bridges from further consideration. It also does not provide new information bearing on significant environmental impacts from the proposed action. As noted above, an SDEIS would likely be triggered only if the high-leveled bridges become part of the proposed action. Changing the proposed action to the composite truss would not.

When it is unclear if a Supplemental is required

When the conditions that require agencies to prepare a supplemental EIS are absent, then agencies can conclude that a supplemental EIS is not required. The FTA and FHWA NEPA Regulations also provide a process that agencies can follow if they are uncertain about the significance of new impacts that would result from changes in the proposed action (23 CFR § 771.130):

P-047-014

(c) Where the Administration is uncertain of the significance of the new impacts, the applicant will develop appropriate environmental studies or, if the Administration deems appropriate, an EA to assess the impacts of the changes, new information, or new circumstances. If, based upon the studies, the Administration determines that a supplemental EIS is not necessary, the Administration shall so indicate in the project file.

The "environmental studies" cited in the above text are not synonymous with "supplemental EIS". The regulation clearly states that the "studies" would be used to determine whether or not a supplemental EIS is needed. The more appropriate instrument to accomplish this would be a NEPA "Re-evaluation" – the purpose of a NEPA re-evaluation is precisely to determine if, based on changes that have occurred since the previous EIS, a supplemental is required. CRC project staff, ~~together~~ after discussions with FTA and FHWA, has evaluated the environmental impacts of the BERP recommendations based on currently available information and have provided this information to elected officials, the public and other stakeholders for review and comment. Following the public outreach process, and direction from the governors regarding bridge type, the lead agencies will conduct a NEPA re-evaluation on whichever bridge type(s) is/are advanced. As previously described, the cable-stayed and tied arch bridge types would likely require an SDEIS, while the composite truss very likely would not.

Would the purposes of NEPA be furthered by preparing a Supplemental EIS on the BERP recommendations?

In addition to specifying when agencies must prepare supplemental EISs, the CEQ NEPA regulations also indicate when agencies may prepare one but are not required to.

- *Agencies may also prepare supplements when the agency determines that the purposes of the Act will be furthered by doing so.* (1502.9(c)(2)).

The two main purposes of NEPA are to ensure environmental information is available to decision makers and the public before actions are taken, and to have better informed decisions based on environmental ~~consequences~~implications.[1] New information is continually developed during the NEPA process, but that doesn't mean that an SDEIS is needed to ensure that it is available to decision makers and the public, or to better inform decisions based on environmental consequences. The environmental consequences of the BERP recommendations have been and are continuing to be made available to the public and agencies for comment, and to decision makers before actions are taken. A Supplemental EIS on the BERP recommendations would not add meaningful opportunities for public / agency involvement that the project has not already made available in the past or currently.

In fact, a SDEIS on the full range of BERP recommendations would be contrary to elements of CEQ NEPA regulations that require agencies to reduce excessive paperwork (40 CFR Section 1500.4) and to reduce delay (40 CFR Section 1500.5). While an SDEIS would likely be needed before advancing either of the high level bridges to an FEIS or ROD, an SDEIS is not needed or appropriate for merely considering and screening the BERP recommendations.

Following the release of the BERP report, the project reviewed the comments received during the preparation of the DEIS, the DEIS comment period and comments received while the bridge panel was convened. It was clear that the public, both through the CRC Task Force meetings and open houses during the 2006-2007screening process had several opportunities to comment

P-047-014

on high level bridges, including the elimination of them from further consideration. Also, there was opportunity in the summer of 2008 to comment on the DEIS discussion of "alternatives eliminated from further consideration", which included all high level bridges. Finally, during the BERP process and subsequent to publication of the report in 2010 and early 2011, the public was invited again to comment on this issue and the BERP report and recommendations.

The project team evaluated the new information presented in the BERP report to explore how the information might affect the findings in the DEIS and if the bridge type should be changed from the open web to one of the recommendations in the report. Impacts cannot be precisely measured without more detailed designs, but the magnitude of the additional impacts associated with the high level bridges is high enough to clearly conclude that the composite truss is environmentally preferable to either the cable-stayed and tied arch bridges.

Case Law Regarding when a Supplemental EIS is or is not needed

The court decisions listed below reinforce the above conclusions drawn from the regulations, including:

- Changes in the proposed action only require a supplemental EIS if they result in significant impacts not previously evaluated in an EIS.
- The availability of new information or new ideas does not trigger the need for a supplemental EIS; new circumstances only require a supplemental EIS if they result in significant impacts from the proposed action not evaluated in a previous EIS.

Two of the court decisions below also clarify that new economic/cost information, and changes that improve environmental impacts of the proposed action, do not require preparation of a supplemental EIS. The following case law references are from Robinson (2006).

- A supplemental EIS is not necessary *"every time new information comes to light after the EIS is finalized."* – Marsh v Oregon Natural Resources Council, N 94 supra, 490 US at 373.
- *"The new circumstance must present a seriously different picture of the environmental impact of the proposed project from what was previously envisioned."* – Sierra Club v. Froehlke, 816 F.2d 205, 210 (5th Cir. 1987)
- *"The key to whether a SEIS is necessary is not whether the area has undergone significant change, but whether the proposed road work will have a significant impact on the environment in a manner not previously evaluated and considered"* – South Trenton Residents Against 29 v FHWA, 176 F.3d 658 (3rd Cir. 1999)
- *"The test is whether the new information so alters the project's character that a new 'hard look' at the environmental consequences is necessary."* – Sierra Club v. Froehlke, 816 F.2d 205, 210 (5th Cir. 1987)
- Economic recalculations do not require a supplemental EIS if the initial environmental conclusions need not be changed accordingly - Native Ecosystems Council v. United States Forest Service, 54 Fed. App. 901, 2003 US App. LEXIS 353 (9th Cir. 2003)
- The US Army Corps of Engineers changed some aspects of a proposed regional water project after the FEIS. These changes made a difference in the environmental consequences, and plaintiffs argued that a supplemental EIS was needed given these changes. The court said that the changes actually resulted in a reduction in

P-047-014

environmental impacts and upheld the agency's determination that no SEIS was needed. – Arkansas Wildlife Federation v. US Army Corps of Engineers, 431 F.3d 1096 (8th Cir. 2005)

CEQ NEPA Regulations regarding the purpose of NEPA process (40CFR Sec. 1500.1).

(a) The National Environmental Policy Act (NEPA) is our basic national charter for protection of the environment. It establishes policy, sets goals (section 101), and provides means (section 102) for carrying out the policy. Section 102(2) contains "action-forcing" provisions to make sure that federal agencies act according to the letter and spirit of the Act. The regulations that follow implement section 102(2). Their purpose is to tell federal agencies what they must do to comply with the procedures and achieve the goals of the Act. The President, the federal agencies, and the courts share responsibility for enforcing the Act so as to achieve the substantive requirements of section 101.

(b) NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA. Most important, NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail.

(c) Ultimately, of course, it is not better documents but better decisions that count. NEPA's purpose is not to generate paperwork--even excellent paperwork--but to foster excellent action. The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment. These regulations provide the direction to achieve this purpose

From: Wills, Heather
To: "John.McAvoy@dot.gov"
Cc: Saxton, Steve
Subject: RE: FTA/FHWA re-eval checklist
Date: Tuesday, March 29, 2011 8:33:28 AM

P-047-014

I would really rather just use the one we already did and add two signature blocks. Since there is no prescribed format for re-evaluations I think this will work.

Heather Wills | Environmental Manager
p. 360.816.2199
willsh@columbiarivercrossing.org

-----Original Message-----
From: John.McAvoy@dot.gov [mailto:John.McAvoy@dot.gov]
Sent: Tuesday, March 29, 2011 7:55 AM
To: Wills, Heather
Cc: Saxton, Steve
Subject: FTA/FHWA re-eval checklist

Heather-

Steve had a FTA/FHWA re-evaluation template. I think we only need minor revisions to reflect the CRC's role (in place of WsDOT) as the local official. Transfer the data to this template, send it back to me, and I think we might be in a good position.

-John

John McAvoy, PE
Major Project Manager
FHWA-Oregon Division
610 E. 5th Ave.
Vancouver, WA 98661
Office: (360) 619-7591
Cell: (503) 949-5980

-----Original Message-----
From: Saxton, James (FTA)
Sent: Tue 3/29/2011 7:33 AM
To: McAvoy, John (FHWA)
Subject: RE: NEPA Experts

We can certainly craft a reply that limits the decision to the narrow question at hand. I think Ted will insist.

I've attached a joint form. Below is a link.

http://www.fta.dot.gov/regions/region10/regional_offices_7747.html

-----Original Message-----
From: McAvoy, John (FHWA)
Sent: Tuesday, March 29, 2011 7:27 AM
To: Saxton, James (FTA)
Subject: RE: NEPA Experts

P-047-014

Steve-

This morning I got an email from our NEPA experts stating, "I think the answer to the narrow question of whether the composite truss on the same alignment, assuming no other changes, is fairly easy and agree that a supplemental DEIS is not necessary." There is still concern that this narrow question will provide the CRC with an opening for interpretation and application to other decisions. For now, I think this provides what we need to complete the re-evaluation.

I still think we can craft the signature blocks with a little revision to reflect a co-federal lead decision process. (You know, turn the FTA document into a FTA/FHWA document). I'll work with Heather on that if it's OK with you.

-John

John McAvoy, PE
Major Project Manager
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610 E. 5th Ave.
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Cell: (503) 949-5980

-----Original Message-----
From: Saxton, James (FTA)
Sent: Tue 3/29/2011 7:03 AM
To: McAvoy, John (FHWA)
Subject: NEPA Experts

Any resolution with your NEPA experts?

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

Sightline Daily
News & Views for a Sustainable Northwest

Sightline Institute

Disappearing Cars, Circa 2002



Northwest traffic started leveling out long before the recession began.

Clark Williams-Derry on August 8, 2011 at 12:03 pm

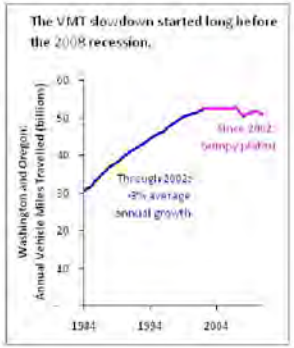
This post is 15 in the series: Dude, Where Are My Cars?

P-047-014

For months now, we've been tracking the fact that vehicle travel in the Northwest—both in general, and on specific urban highways—has been surprisingly flat for years, even decades.

One of the most common reactions to this news has been: *well, duh, there's a recession on.* A few folks have argued that once the recession lifts we'll see vehicle travel resume its steady ascent.

I think that misses the point of what we're finding. **The slowdown in vehicle travel started long, long before the current recession began.** In fact, it started back when the economy appeared to be humming along quite nicely.



The graph to the right shows it best. Total annual vehicle travel in Washington and Oregon grew steadily for many years. Then, in about 1999, growth started to moderate. And after a few years of slower-than-average increases, traffic volumes essentially plateaued in 2002.

Since 2008 we've seen driving dip, tick upward, and then dip again—which is perfectly consistent with what's happened with the economy and fuel prices.

But the interesting part of the story isn't the recent trends. It's what happened *about a decade ago* to make the VMT curve flatten out.

Remember, there was a bit of a recession in 2002—the year of the VMT plateau. But from 2002 through 2007, unemployment in the Northwest fell steadily, even as the population of Oregon and Washington grew at a steady clip.

But still, despite increases in both population and economic activity, VMT in the two states barely budged from 2002 until the recession began.

I'll leave it to some future PhD student to figure out precisely what caused the shift in VMT trends in the late 1990s and early 2000s. I have lots of theories:

Major urban highways hitting **capacity constraints**;

Increases in gas prices, coupled with a growing belief that gas prices wouldn't ever hit the lows of the late 1990s again;

Demographic changes, with more senior citizens and smaller families leading to less driving per person;

Land use shifts that let more people walk, bike, or take shorter, chained car trips for daily errands;

Possibly, declines in **new road construction**;

An increase in **flexible work schedules**, with more people working from home on some days;

The **internet** cutting back on shopping and/or work trips;

Cultural shifts that substituted tech toys for cars as objects of desire; and

Economic shifts, with fewer teens working (or looking for work) and widening income disparities that made it hard for some folks to pay for cars and gas.

Those are just theories; some are probably wrong. But regardless of the precise reasons, the trends themselves are clear enough. The

P-047-014 Where are my cars?" story doesn't simply follow the trajectory of the recession. It's a more complex story, with older roots.

Previous post in series:
« Washington's 700 Million Gallon Diet

Next post in series:
A Generational Shift In Driving? »

Read more in Land Use & Transportation

Comments

Eugene Wasserman says:
August 10, 2011 at 10:29 am

The major increase in the 1980's for vehicle miles traveled was from the increase of women moving in to the work force. That shows the step increase in vehicle miles traveled.

In the 2000 to 2010 years the City of Seattle lost 40,655 jobs, while the region outside Seattle gained 51,130 which would cause a plateau on urban highways.

Seattle's population growth was below the region's growth.

The plateau in the urban highway BMT's traveled are probably the result of the plateau of Seattle's population's growth and the major decrease in Seattle's employment.

Reply



Eric de Place says:
August 10, 2011 at 11:10 am

Eugene,

I don't follow your reasoning. The chart shows total VMT for Washington and Oregon combined, not for Seattle by itself.

If employment and population really did shift outside of Seattle (or other city centers) during the 2000s one would assume that would have exerted an upward pressure on VMT. So, in other words, the plateau in VMT starting in 2002 is even more remarkable.

Reply



SpencerPDX says:
August 11, 2011 at 1:48 am

In your list of potential reasons for declining VMT you might also consider adding a bullet point for environmental concerns.

The early 2K's is about when I started paying serious attention to troubling information about the impact of formerly fossilized carbon on climate. I imagine I'm not the only one.

Not that most of us (myself included) totally stopped driving because of this concern.

But where in the early nineties I saw driving as a fairly guilt-free activity that was a form of recreation in and of itself, now I tend to look at it as something I only do when the destination warrants it. And that mainly comes down to the fact that in the intervening years the burning of fossil fuels started to seem like an all-around bad idea, a thing to be avoided if possible. (Especially if an alternative like biking or walking is easy and pleasant.)

So while environmental concern might not lead to major behavior changes for most of us, it could contribute to a trend away from driving. This in much the same way that high gas prices won't entirely stop people from driving, but might make them think twice about it.

Reply



Clark Williams-Derry says:

[redacted] August 11, 2011 at 7:09 am

P-047-014 That's a good point, Spencer! And I suppose we could add national security concerns as another possibility. After 9/11, a lot of folks who never think twice about the environment started thinking hard about the security implications of oil imports.

Reply

Eugene Wasserman says:
August 11, 2011 at 7:05 am

VMT's generally follow employment growth. So I cannot totally explain the plateau except to guess the as people and jobs move to the suburbs people are actually closer to their jobs. The other guess would be that as people sit in traffic they are driving less miles.

The decline would be the impact of gas prices which if I remembered correctly occurred before the recession.

Reply



Clark Williams-Derry says:
August 11, 2011 at 7:18 am

For the Northwest, I think it's fair to say that VMTs used to follow employment growth. But since the late 1990s they haven't – or at least, not consistently.

I agree that road capacity constraints in urban areas may be part of the story. But again, the trends are statewide, and not all roads in the major metro areas of the NW are clogged at rush hour. And besides, some roads started becoming capacity constrained long before 2002.

My sense is that the biggest determinant of the trends has been gas prices – which hit all time inflation-adjusted lows in about 1999, and have followed a bumpy upward path since then. A lot of those other trends may have their roots in gas prices.

Reply

Eugene Wasserman says:
August 12, 2011 at 9:25 am

It is important to take into account the increasing consultants and workers working out of their homes and the probably reduction of in store retailing because of Amazon.

Reply



SpencerPDX says:
August 19, 2011 at 9:40 pm

Another theory to add to the pile, this one from Ezra Klein:

"What could explain this cultural shift? Maybe more young people are worried about the price of gas or the environment. But—and this is just a theory—technology could play a role, too. Once upon a time, newly licensed teens would pile all their friends into their new car and drive around aimlessly. For young suburban Americans, it was practically a rite of passage. Nowadays, however, teens can socialize via Facebook or texting instead—in the Zipcar survey, more than half of all young adults said they'd rather chat online than drive to meet their friends"

http://www.washingtonpost.com/blogs/ezra-klein/post/why-are-americans-driving-less/2011/08/18/gIQALv7tNJ_blog.html

Reply

Sightline Daily
News & Views for a Sustainable Northwest

Sightline

Washington's 20 Billion Mile Diet



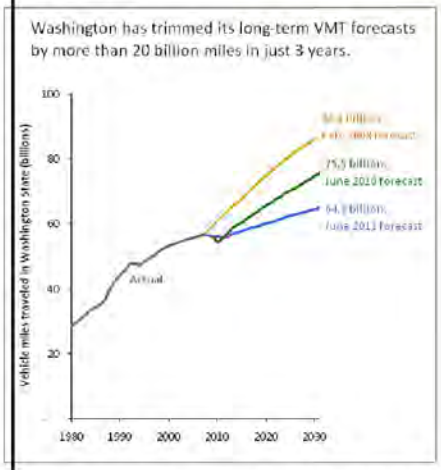
State traffic forecasts have changed radically in just three years.

Clark Williams-Derry on August 2, 2011 at 11:32 am

This post is 13 in the series: Dude, Where Are My Cars?

P-047-014 According to the most recent forecasts from the Washington State Office of Financial Management, drivers in Washington State will rack up about 65 billion miles on the highways in 2031.

I have no idea if that number is anywhere close to accurate. Nobody does. But what I do know is that the current estimate is 21 billion miles *lower* than the forecast that OFM made 3 years ago, and more than 10 billion miles lower than their forecast from just last year. The chart has the details:



It's awfully tempting to suggest this chart shows that OFM is gradually groping towards more realistic traffic projections.

But does it, really? To be honest, I don't actually know if the blue line is more "realistic" than the orange line. Sure, the blue line is more consistent with the actual traffic trends over the last decade—a period when annual VMT growth slowed to a crawl. But I don't have a crystal ball that tells me which of the three lines is the most "realistic" depiction of the future.

Instead, I think the real lessons of the chart lie elsewhere.

The first lesson is this: *nobody has any special insight into the future*. Future VMT trends aren't a feature of objective reality that smart people can sit in a room and puzzle out. They're just ***guesses***. Sometimes new information comes in, and the guesses change. Sometimes they change radically, enough to make the best guesses from a year earlier look ludicrous. So it's important to remember that even if particular forecast matches up with your world view, *it's still just a guess*.

Which leads to a second lesson: *nobody should take official VMT forecasts too seriously*. Three years ago, the "official" guess was that

P-047-014

here would be lots of new demand for road space, and lots of new gas tax revenue to pay for it. Today, the "official" guess is that statewide gas consumption peaked in 2002 or 2003, never to rise again; that gas tax revenues are going to decline unless the state ramps up the tax rate; and that the demand for new road space is going to slow to a crawl. Those are two completely contradictory views from the same agency in the same political administration. So all the hot air that was spewed about the dire need for new transportation megaprojects to avoid the near-certainty of a trafficopalypse showed nothing more than hubris, overconfidence, and a dismal understanding of how forecasting actually works.

And there's a third lesson here: *forecasts can be dangerous*. People have a tendency to take official forecasts awfully seriously. But the decisions we made three years ago that we "had" to put lots of new megaprojects into the pipeline, based on forecasts of massive gridlock in 20 years, could very easily turn out to be dreadfully costly mistakes. When we place too much confidence in any one forecast, we can wind up making terrible decisions.

To me, the rapid change in traffic forecasts argues for a new way to think about transportation investments: that we make them smaller, more versatile, more nimble, more creative, and less likely to lock us into huge long-term expenses for projects that we might not actually need. In short, it argues for an approach that's the *exact opposite* of all the multi-billion dollar bridges, tunnels, and highway expansions that are on the docket in the Northwest.

Previous post in series:
« WSDOT vs. Reality

Next post in series:
Washington's 700 Million Gallon Diet »

Read more in Land Use & Transportation

Comments

Southender says:
August 2, 2011 at 11:50 am

Great post as usual.

As a side note to actual state VMT, the most conservative estimate of the unrecovered costs of driving is $0.15/mile (source: FHWA) (a subsidy by any other name, but anyway...). If we were to asses just the most direct costs, Washington state and its communities would receive $9.75bn every year. That money would go a long way toward dealing with pavement condition, structurally deficient bridges, and even Sen Haugen's beloved ferries -- and would reduce a bit of VMT to boot.

Reply

Jim says:
August 2, 2011 at 10:14 pm

I've seen this graph before and it used to justify why we don't need the vast road infrastructure that the state is planning. I take the point that the WSDOT estimates are based on models and are just projections, but the obvious point hasn't been made. I don't know whether its justifiable, but I'll make the point anyway.

Doesn't the "rapid change in traffic forecasts" seem to correspond nicely to the drop in our economy and the shedding of jobs? Would it therefore suggest that these traffic improvements are not unnecessary when the economy returns, jobs return, and people begin commuting to work again?

Reply



Clark Williams-Derry says:
August 3, 2011 at 8:51 am

Jim-

The economy is definitely a major force in the trends from 2008.

It's possible that forecasters are feeling gloomy, and their long-term GDP growth forecasts have been affected by the short-term

P-047-014

economic woes.

But reading the numbers, VMT growth slowed WAY before the economy cratered. As I read things, it looks like the forecasts are moving towards a belief that "things in the future will look like they did from 2001-2007, rather than from 1992 through 2000." In some ways, what's happening is that an OLD vintage of super-over-optimistic forecasts that seemed reasonable in the 1990s is going away, and a NEW vintage of semi-optimistic forecasts that match the early 2000's is coming into force.

Here's what I think has changed in the models:

1) Forecasters now think that oil prices are going to remain high. As recently as 2008, ALL of the major oil forecasts showed oil prices at ~$30/barrel and roughly flat/declining as far as the eye can see. The runup that started in 2005 was seen as a temporary blip. But even though the economy is still struggling mightily, oil prices are high -- so high & ascending oil prices are now built into the models. (Incidentally, from what I've seen the models are based on assumptions that gas will be ~$3 per gallon).

2) Forecasters now better understand how consumers react to high gas prices. For a couple of decades, gas price blips had no appreciable effect on demand. When gas prices went from $1 to $1.20, nobody batted an eye everyone kept buying. So the "professional" opinion was that gas price elasticity was incredibly low -- people would continue to drive no matter how high prices got. But it seems that gas at $4 a gallon has really made a dent in people's appetite for travel. Elasticity is higher than people thought. Couple that with higher than expected gas prices, and you get a significant dampening effect on driving.

3) The understanding of demographics -- seniors driving less, fewer teens and young people working -- may have changed, altering long-term estimates of trip generation.

There are probably other factors. The important thing, though, is that the long-term projections now show that the future will be like 2001-2007, not like the roaring 1990s. That may still be too optimistic! But it's not *just* that the sour economy in 2011 is changing expectations for economic growth in 2030; it's also that the models are catching up to the reality of what was happening in the early 2000s.

Reply

Steve Erickson says:
August 3, 2011 at 10:25 am

These sorts of grossly inflated forecasts have disastrous consequences for long term planning and economics. Right now there are two different sewer projects being planned on Whidbey Island that are based on straight line projections of 10 year old OFM "high-mid" population forecasts that are demonstrably way higher than has actually occurred. This is the result of a combination of the lag in updating the County's GMA population forecasts, attributable to the lack of planning dollars available right now, and the boomers previously in power consistently choosing from the high end of OFM population forecasts, despite hindsight consistently showing that the reality was different. So, now Oak Harbor (current population: about 23,000) is planning a $60 million new sewage plant and the non-municipal urban growth area of Freeland (current population: about 4,000) is planning a $40 million sewer.

Looking at census data since 1970 reveals that since 1980 the rate of population increase has dropped by about 50% for each succeeding decade. If this long term trend continues the 2010-2020 population increase rate will be close to 0%. In fact, Island County has actually lost population (a bit over 3%) in the last 3 years. So, Whidbey and Camano Island may be about to achieve a steady state population or decline. This is something boomers just can't comprehend.

Reply

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WSDOT vs. Reality



Puget Sound traffic forecasts don't even pass the laugh test.

Clark Williams-Derry on July 13, 2011 at 1:15 am

This post is 12 in the series: Dude, Where Are My Cars?

P-047-014 I wish I were making this up. The Washington State Department of Transportation continues to insist that traffic volumes on the SR-520 bridge across Lake Washington are going up up up—even though actual traffic volumes have been flat or declining for more than a decade! Here's a chart that makes the point.



In a charitable mood, you could forgive the 1996 projections. Back then, rapid traffic growth on SR-520 was a recent memory: up through about 1988, traffic growth was both steady and rapid.

By 2011, however, it should have been perfectly obvious that the old predictions were proving inaccurate. Yet WSDOT just kept *doubling down on their mistakes*—insisting that their vision of the future remained clear, even as their track record was looking worse and worse. So now they've wound up with an official traffic forecast, in the final Environmental Impact Statement no less, that doesn't even pass the laugh test.

It would be funny—if the state weren't planning billions in new highway investments in greater Seattle, based largely on the perceived "need" to accommodate all the new traffic that the models are predicting will show up, any day now.

In case you don't believe me about the numbers, feel free to check out the sources directly. I'd be happy to be corrected.

The data on recent traffic volumes—the dark green dots—come from three sources. I start with WSDOT's biennial Ramp and Roadway Report. Then, to add in the missing years I factor in data from the Annual Traffic Report series and Seattle's Traffic Flow Data. The blue trend line is just the basic linear regression of the blue dots, as calculated by Excel.

The light orange line is based on a projection that dates back to 1996, which was mentioned in WSDOT's 1999 Trans-Lake Washington

P-047-014

udy. Since that report is only available on CD-ROM, but not online, I'll quote the report directly:

> Under the No Action solution set, Trans-Lake travel [on SR-522, SR-520, and I-90] is expected to increase by about 168,000 daily person-trips...in the year 2020...because capacity is limited on SR 520, only about 20,000 additional vehicle...trips are expected there.

(If current trends hold, the projections of 20,000 additional vehicle trips will be off by about 20,000 additional vehicle trips.)

The green line is from the 2002 Trans-Lake Washington Project report, also available on CD-ROM, which projected that traffic under the "No-Action Alternative" would grow by 20 percent through 2030.

The dark orange line—127,400 cars by 2030—is from the recently released Final Environmental Impact Statement for the SR-520 bridge replacement project. It's based on the projections described in part 1 of the "transportation discipline report" (see Exhibit 5-3 on p. 92 of the pdf, and the projections for SR-520 at Midspan under the 2030 No Build Alternative: 127,400 vehicles by 2030).

I could have included another projection from the 2006 Draft Environmental Impact Statement—127,860 vehicles per day by 2030, as claimed in Exhibit 10-8 in Appendix R part 6. But it was getting hard to fit all the wrongness on a single chart.

Now, I know that total traffic volumes aren't the only traffic trends worth paying attention to. The traffic models make projections about peak-hour delays as well, which are probably what commuters care most about. But given that the models have proven so stubbornly and preposterously wrong about traffic volume trends, it's hard to believe that they have much of value to say about future traffic delays.

[Thanks to Jake Kennon and Pam MacRae for help with the numbers!]

Previous post in series:
« The Tolled Tunnel: Almost An Earthquake?

Next post in series:
Washington's 20 Billion Mile Diet »

Read more in Land Use & Transportation

Comments

Cheryl dos Remedies says:
July 13, 2011 at 11:36 am

This is WSDOT's reality: a 12-lane highway cutting through the Arboretum's wetlands, from Montlake to Foster Island.

It breaks down like this: 3 lanes of traffic + 2 lanes of ramps + 1 lane of shoulder x 2 = 12.

I'm not sure how to reconcile the traffic data above with what I know about this project, so Clark, I could use your help.

During peak hours, my understanding is that I-5 cannot handle the increased traffic of a 6-lane bridge, so WSDOT is planning 4 lanes of ramps in the Arboretum's wetlands to store cars as they try to merge onto I-5. This will prevent back-ups into the Montlake neighborhood and at the I-5 interchange itself.

Word on the street is that the "ramps will be removed from the Arboretum," but this just isn't true. It is true that the existing ramps that peel off and connect to Lake Washington Boulevard (LWB) will be eliminated, yet the negative impacts to the Arboretum increase. Here's how: WSDOT is planning for the new ramps placed in the wetlands to connect back into LWB, just at a point that is technically outside of the Arboretum. WSDOT expects highway traffic to increase through the heart of the Arboretum along LWB.

Under current federal regulations, we should not be able to bisect a historic park with highway traffic at all, but WSDOT leans on the site's "pre-existing conditions."

Watch this video and please pay especially close attention to 3:40 - 3:50 and 4:14 - 4:30: http://www.youtube.com/watch?v=mCY7COUSs0k

And next time you are on I-5, count the lanes and imagine that swath pavement cutting through the Arboretum. Imagine kayaking in the Arboretum with 12 lanes of highway overhead.

12 lanes of highway to store idling cars in Seattle's most pristine wetlands. . . this is WSDOT's reality? This is insane.

Reply

Randy says:
July 13, 2011 at 1:01 pm

P-047-014 Bottom line, Seattle and WSDOT have no clue what they're doing. If you think effective traffic management is creating HOV lanes in on ramps and going from 6 lanes to 2 lanes downtown is effective, you're high. Even the express lanes aren't express any more. When it takes 45 minutes to get across either the 90 or 520 bridge, it is obvious there is no planning. There was no plan for traffic management in Seattle and I've lived in much larger cities where traffic wasn't half as aggravating. Add to the poor planning drivers who have NO clue how to drive and it all becomes a pile of mess.

I challenge anyone to figure out how to get the appropriate amount of traffic across any highway in this town all the while focusing on the environment. It can't be both ways. We can't expect to fix traffic issues and keep ALL environmentalists happy. It seems to me all the idling I do on the highway is worse for the environment.

Reply

archie says:
July 13, 2011 at 8:05 pm

Congestion pricing.

Reply



Clark Williams-Derry says:
July 14, 2011 at 2:29 am

bingo.

G-Man (Type E) says:
July 15, 2011 at 12:16 pm

No one will pay for congestion. They get plenty of it for free already.

How about "De-congestion price" or "free-flowing lanes charge" or "guaranteed travel time price" or anything else that accurately conveys that concept? How about instead of saying we want to toll or price a highway, we say we would like to sell commuters access to guaranteed free-flowing lanes. Focus on the benefit, and to support projects like pricing I-5 express lanes, let's trot out the evidence from other cities that this actually improves traffic flow in adjacent non-tolled lanes as well.

Randy,
If we add an extra lane you will pay more taxes or tolls for 30 years on an improvement that alleviates your idling for maybe 5 years max. After that congestion would be back to today's levels but with a higher cost to clean air, water and land. If we used variable tolls you would pay daily at your own discretion. A sign could say - this lane $5 / 15 minutes, that lane free / 30 minutes and you make your choice. How's that for freedom? (for the 520, your free alternative would be I-90 and any smartphone now can tell you the time difference). Variable tolls that assure travel time also mean faster, more reliable buses - means more people using them - means less competition on the road from other drivers - means lower tolls and a faster commute for you - a virtuous circle! You're wrong to think there isn't a solution - there is always a path to progress if we are bold enough to act without fear, grounded in solid evidence of the real relationships that shape our world.

Danny says:
July 25, 2011 at 2:12 pm

WSDOT already has some congestion pricing in place, why not bring it to Seattle?
http://www.wsdot.wa.gov/NR/rdonlyres/A43B9DD4-4228-482E-8F82-CEE3198315A0E/69595/2ndAnnualReport_I67HOTLanes2.pdf

Paul Sirkeland says:
July 13, 2011 at 2:58 pm

P-047-014 Well, Clark, as Kurt Vonnegut might have said, "Hi ho!"

I actually derive some hope here. If in the face of explosive growth in Redmond and at Microsoft over the last 16 years, and in the face of such moderate gas prices and overall population growth we still managed to reduce traffic volume, it makes me believe that there is some fundamental dynamic driving us (no pun intended) to drive less. Not sure what it is, but its impact is a positive one, and perhaps unstoppable.

As far as the DOT models go, I would wonder exactly how they were built. Typically models like that are not just linear extrapolations from the past. They are usually 'build ups' of various economic projections - this much freight traffic, this much commercial traffic, this much commuter traffic, etc. You add them up and get your total.

So what in the DOT models didn't happen, and why? Are we telecommuting more? Is freight going somewhere else? Is commercial activity developing in a different geographic pattern than projected?

Answers like that would substantiate the fallacy of the models, and perhaps lead to improvements that might yield more accurate estimates of future traffic.

Nice work here, Clark.

Paul

Reply



Clark Williams-Derry says:
July 13, 2011 at 3:17 pm

Paul - I don't pretend to be an expert on the models. But the PSRC travel model is basically a "4 step" model. Step 1 is to estimate demand for trips, based on projections of population, income, employment, fuel costs, and other economic/demographic factors. Step 2 is figure out where the trips go, based on a "gravity model" of the attractiveness of various destinations. Step 3 is to assign mode, and step 4 assigns routes.

My working hypothesis – which is really no more than a guess – is that step 1 isn't working well. Despite income & growth, we're not generating as many trips per person as we used to. I agree, that's a good thing overall, but some of the big causes aren't all good: high gas prices that cause economic hardship to families; lower-than-anticipated employment, particularly in certain demographics; etc. Regardless of the reasons, total VMT trends aren't moving the way people were anticipating they would. Things have changed. Will they change back? Who knows?!

But I also sense that there's something broken in Step 2. That is, the models overestimate the "attractiveness" of crossing 520. The models suggest that people should be lining up earlier & earlier to get to jobs & stores on the other side of the lake. Maybe they are – but if so, it's not reflected in total traffic volumes. And it seems to me that the flaws with the trip distribution step of the model surfaced long before the mid 2000's, when gas prices started to rise in earnest.

Reply

DJStroky says:
July 13, 2011 at 4:38 pm

Step 4 is where the bulk of the error comes from in my opinion. Most models won't immediately stop assigning traffic onto a road if the volume/capacity ratio goes over 1.

I think the real reason traffic hasn't grown on 520 is that it has been completely at capacity for the last 10 years or more. And not just 520, wherever there are roads that are completely clogged no growth ought to be expected.

Carl says:
July 15, 2011 at 12:00 pm

Then when we create new capacity on 520, there will be induced demand to drive it since it will be easier.

I wonder whether DOT has modeled the effects of tolling, or whether people understand that it is $7 round trip in peak times

P-047-014



Clark Williams-Derry says:
July 15, 2011 at 3:20 pm

Carl
I agree. I think that it's likely that if the bridge were widened and had no tolls, it would quickly get saturated with additional traffic.

Eric Doherty says:
July 13, 2011 at 5:42 pm

If I remember correctly it was General Motors that funded the development of 4-step traffic models.

Someone less polite than me might say that computer assisted BS is still BS. Good thing I am so polite and would never say such things.



Clark Williams-Derry says:
July 13, 2011 at 4:57 pm

DJStoky -
Good point. Maybe a synthesis: the results of step 4 don't get fed back into step 2. When roads get full (step 4) the increased travel times aren't properly factored back into the "attractiveness" of the affected destinations (step 2).

Reply

Levin Nock says:
July 15, 2011 at 10:27 pm

What will it take for the transportation planning industry to update the industry standard of modeling to include things like feedback loops, verification and calibration? A masters student would be flunked for a thesis with such woefully inadequate modeling, yet we continue to invest billions of dollars based on this "guidance".

Levin Nock says:
July 15, 2011 at 11:05 pm

Based on Rob's message below, it sounds like the actual models are quite sophisticated, but the results are usually labeled incorrectly. Has anybody seen a traffic forecast chart labeled "Number of trips that people wish they could take, in the absence of any congestion or congestion pricing"? I've never seen it. The word "forecast" suggests that the forecaster expects something to actually happen not that they expect people to wish for something that will never happen.

Ellin says:
July 13, 2011 at 3:27 pm

As you calculate the width of the new Floating Bridge (Stage 1, said to be funded) and the new West Approach Bridge (Stage 2, unfunded), note the additional 14-foot lane for the bicycle/pedestrian path, 10 foot shoulders, 11-foot general purpose lanes, 12-foot HOV lanes, all capable of being restriped for more lanes, and a gap ranging from 35 to 40 or so feet reserved for Light Rail between the "North Bridge" and the "South Bridge." WSDOT's Request for Proposals (RFP) is for a "Future Six-Lanes Plus Two HCT Configuration, not for a Four-Lanes Plus Two HOV Lanes to be converted to HCT later. See the RFP on WSDOT's site.

Reply

Rob says:
July 14, 2011 at 9:46 pm

This is a good observation, but not difficult to explain in modeling terms. Transportation models (all of them, not just WSDOT's, which is also the PSRC's) attempt to model demand, not throughput. In real life, traffic on both I-90 and SR 520 has been constrained by capacity

P-047-014

a long time. Eastbound and westbound traffic is about equal, not because there's equal demand each way, but because capacity limits have been reached in both directions. So yes, traffic's not likely to grow a lot more with the current facility – but that doesn't mean there aren't lots of people who would cross the lake if it weren't so onerous.

There is a volume-delay curve in the model that attempts to show how traffic will slow if demand exceeds capacity, but it's not perfect. When the model is calibrated to current conditions, it's tweaked until it produces results that match current volumes, so it's forced to show demand equal to throughput. But as population and employment grow in the future, the model will try to add trips incrementally throughout the network, so it's likely to show some growth. This effect is most pronounced for cross-lake trips, since there are no alternative routes to the two cross-lake highways. In other places the model is more successful finding other routes to move the demand to.

Demand has also been slowing recently because of the prolonged recession. The most effective transportation demand management strategy remains to wreck the economy – but it's not clear that's a good strategy to plan for over the longer term. Also, if 520 is widened, even for HOV, there will be more throughput because (1) there is a ton of latent demand there, and (2) in addition to increased capacity, just having shoulders will stop breakdowns and wrecks to bring traffic to a halt.

I think the take-away from this should be that model results should always be accompanied with a primer on modeling limitations. They aren't perfect, and every modeler will be honest about that. In real life traffic probably won't increase if the bridge isn't expanded, and it will get only marginally more congested. But more people will "wish" they could cross the lake than will be able to, and whether it's a good or bad thing to accommodate them is a policy choice, not a technical issue.

Reply



Clark Williams-Derry says:
July 14, 2011 at 10:21 pm

I totally agree with you about the limits of models – and that responsible modelers are always careful to respect those limits. If only we could get everyone to read a treatise on modeling limits (along with examples of obvious failure) before they were even allowed to contemplate model outputs, the world might be a better place.

But unfortunately, I'd argue that's not even close to the role that modeling plays in the public debate. Instead, politicians and project boosters treat model outputs as near-certain predictions of perpetual gridlock. In fact, I'd argue that the models underpin & prop up a broad and deeply flawed consensus about how travel habits change over time.

Which brings up a question – should we even bother to use models in a case like 520? The current crop of models is simply useless at predicting actual traffic trends, and the near-universal misinterpretation of model outputs deeply distorts the debate.

If politicians had the courage to say "we are building a wider bridge because we think that a lot of people would like to drive on it," we'd have an honest debate about the costs & benefits. But instead they say "ZOMG you'll all be stuck in traffic armageddon!!! I know it's true because....models!" And we wind up building more megaprojects than we need, paid for by people who don't see much benefit from them.

Reply

Levin Nock says:
July 16, 2011 at 7:41 am

It appears that the calibration process fudges the model, to pretend that the model is related to reality. Since 1996 and before, there have been plenty of people wishing they could travel more on 520; even in 1996, 2002 and 2011 when WSDOT pretended there were none. Since WSDOT wants to model wishes, rather than actual traffic, they should draw a horizontal line up around 200,000 or 300,000 or somewhere above, sloping gently upward, to make crystal clear that the only way to address this demand is with light rail and commuter rail, or possibly complete networks of free-flowing bus lanes and cycle paths.

Reply

Jessica says:
July 15, 2011 at 11:30 am

Clark, do you have data (and free time) to add actual traffic volumes from earlier years? I'd like to see when the downward trend started and whether the slopes of WSDOT's estimates have ever matched actual traffic growth. That is, has traffic ever grown that fast? If so, how long ago?

Thanks for this post-it's exactly why I donate to Sightline every month!

Reply

Jesse says:
July 15, 2011 at 7:24 pm

P-047-014 I now we need some increased capacity, but I'd rather that errored on the side of shoulders and HOV lanes. Those by themselves would double the size of 520 and probably greatly increase throughput.
But as I love to quote an Orlando traffic engineer: "Widening roads to solve traffic congestion is like loosening your belt to cure obesity."

Reply

Levin Nack says:
July 16, 2011 at 7:20 am

Here's a corollary:
"Forecasting Seattle traffic while assuming there's no congestion is like forecasting Seattle weather while assuming there's no rain."
It's not very useful, and it just might be misleading.

Reply

Southender says:
July 18, 2011 at 12:54 pm

People have commented that the translake connections are capacity constrained, which may have some merit with 520, though volumes and hours of delay are decreasing. Latent demand would likely absorb the freed up capacity if that were true.

Also, the I-90 bridge was forcast to have significant increases in traffic volume, which it has the capacity to sustain. Likewise, the models have significantly overestimated the ADT and peak-hour volumes there as well.

With the trends begining a long-term reversal in 1996, especially when compared to regional population growth, it's also hard to argue that the effect of either of the two recessions that happenend over that time-period is solely or even largely responsible for the decline.

Reply

Bryan says:
July 19, 2011 at 3:01 pm

I would think it would be readily apparent to everybody (but apparently it is not) that the reason traffic has been trending down is because natural changes to the structure of growth occured due to the restriction that seattle traffic placed upon that growth.

In most other cities you would see the core grow as whole local economy grew. Financial, shopping, etc would typically grow in the core as the outer businesses grew. So compare those traffic projects to Bellevue growth during that time. The growth of Bellevue could largely be attributed to the utter lack of access to downtown Seattle provided by the capacity of 520 and 90 (as well as horrible I-5 connections at their western termination).

Reply

Ralphus says:
July 19, 2011 at 9:48 pm

Using a linear regression to predict future traffic volumes from historic ones is a deeply flawed methodology. In fact, it is the almost assuredly the same methodology WSDOT used to generate the inaccurate growth predictions you're discussing (although perhaps using a longer time frame or area-wide figures). Maybe volumes really will not display much growth, as you predict, but a linear regression is not much proof of that.

Also, I thought clarification on the actual base-data in your graph might be pertinent. WSDOT's Ramp and Roadway Report provides Average Weekday Traffic (AWDT) volumes reflecting Tuesday through Thursday. This data is almost exclusively drawn from electronics in the roadway that are primarily purposed for real-time traffic management. However, most statistics in the Annual Traffic Report are

P-047-014 nual Average Daily Traffic (AADT) volumes reflecting Sunday through Saturday. This data is drawn from the WSDOT HQ traffic counting program, which is designed to collect data for planning purposes. Because weekday volumes are almost always higher than Sunday through Saturday averages, the statistics found in these two sources are not comparable. The only exception would be for the 150 or so permanent traffic recorders for which data is provided in the Annual Traffic Report. For these recorders (which are the most accurate that WSDOT has at its disposal) both AADTs and AWDTs are provided. One of these is on the 520 bridge, and is listed in the Annual Traffic Report as recorder D10. The AWDTs for this recorder are listed below, although the older ones need to be requested from WSDOT since AWDTs were not carried in the report until 2001.

2009 : 106599
2008 : 105994
2007 : 107040
2006 : 108237
2005 : 111035
2004 : 110293
2003 : 110524
2002 : 109719
2001 : 110541
2000 : 111786
1998 : 112671
1997 : 111281
1996 : 108719
1995 : 110094

Reply



Clark Williams-Derry says:
July 21, 2011 at 4:10 am

Ralphus-

It seems like you think that the dark green line is a prediction. This line is nothing more than a regression, describing the past trends. I'm not offering my own predictions here – only an observation that past predictions haven't held up.

Reply

Ron Richings says:
July 25, 2011 at 2:03 pm

I don't have a problem with your basic critique, but the graph that you used is really a bit misleading by virtue of eliminating the scale below 90,000. If you presented the full graph down to the zero base what now looks like a fairly vast discrepancy would instead look, correctly, like a relatively small proportion of complete traffic estimates.
I know, I know, people often use only sections of graphs to help illustrate their points, but it is really bad practise when used to give an overall impression for general public consumption.

Reply

Rhys Roth says:
July 26, 2011 at 3:37 pm

On the other hand, what really matters in terms of rationalizing expansion of the bridge is how much ADDITIONAL traffic is expected when. From that standpoint, Clark's graph focuses exactly on the essential information and does put it in proper perspective.

Reply

Stu Ramsey says:
July 26, 2011 at 3:56 pm

Wow, it's not everyday you see an extened discussion of the weaknesses of transportation models! I used to make a comfortable living

P-047-014

...nning this exact type of model, and I agree with many of the concerns raised. The models inherently assume that people will make the same decisions in the future that they did in the past. And that all trips will be completed, no matter how congested the network gets.

By and large, modellers spend a lot of time agonizing over small modelling questions (will this road have a capacity of 600 or 700 vehicles per hour?) and ignoring the larger ones (will there be carbon pricing? will the built environment encourage more active modes?).

For the truly dedicated student, I discuss these questions on my web site. You can go to http://www.transportplanet.ca/presentations.htm and scroll down slightly to the various links for "Of Mice and Elephants". Your choice of PowerPoint file, 40-minute video, or peer-reviewed technical (but still readable) article.

Among other things, I concur with Clark's statement that there are times when we would be better off to not run the model at all.

Reply

political_incorrectness says:
August 18, 2011 at 1:59 pm

They are trying to pull a George Massey tunnel with 520. 6 lanes to 2 never works and ends up forming one giant queue. Also, this might have negative consequences with I-5 southbound which suffers from chronic congestion from Lake City Way to the Ship Canal Bridge after the express lanes change over. Realfisitcally, I-5 will probably need to be rebuilt for a 4x2x2x4 configuration in order to get the best throughput. It will be damn expensive but I think that is probably the best way to do it if I-5 is rebuilt. If they are expecting Eastside growth, they should probably allow transit expansion across the bridge. I find it disturbing that some believe the express lanes on I-90 provide valuable capacity when they are merged at the very end and only cause congestion later.

Reply

Dave says:
August 26, 2011 at 9:45 am

I think the heart of the matter here is a questions of how one manages the uncertainty of the future. Forecasts are not predictions of the future so much as they are risk management tools.

I completely agree that the trendline forecasts typically assume future trends will basically match the past. I'm working on the update to the GMA Transportation Element guidebook right now and one of the main new themes I'm trying to devleop is how to manage uncertainty. Many have observed that our ability to predict the futrue based on the past is significantly less now that it was 20 years ago. If any of you care to visit the project webe site, I'd be very interest in your comments. We are releasing preliminary drafts chapter-by-chapter, with a final draft coming after that.

Reply

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Sightline Daily
News & Views for a Sustainable Northwest

Sightline Institute

Dude, Where Are My Cars: Multnomah County



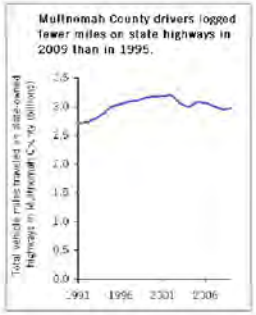
In Oregon's most populous county, there was less driving on state highways in 2009 than 1995.

Clark Williams-Derry on October 3, 2011 at 3:11 pm

This post is 18 in the series: Dude, Where Are My Cars?

P-047-014

Continuing my obsession with flat-lining traffic trends, here's a chart showing that drivers in Multnomah County--Oregon's most populous county, and home to Portland--logged fewer miles on state-owned highways in 2009 than they did in 1995. Traffic volumes on those roads hit their all-time peak in 2002.



The numbers all come from the Oregon DOT website (here's a link to the actual spreadsheet with county-level VMT figures).

What puzzles me is: why aren't the facts about flat traffic trends more widely known? It's not like they're particularly new; throughout the northwest, traffic growth has been defying predictions for well over a decade. Yet still, many folks who ought to know the trends are disinclined to believe them.

For example, one of the most common reactions (including an unflattering comment by an *Oregonian* reporter) to our report last month on Peak Gas--which showed that gasoline consumption in Oregon and Washington flattened out in 1999--was that the trend was largely caused by gains in the fuel efficiency of cars and trucks.

The thing is, *that's not actually true*.

For much of the period of "peak gas," the light-duty vehicle fleet was actually getting *less* efficient. Through the mid-2000s, the auto industry was focusing its technology improvements on increasing horsepower, not improving fuel efficiency. Meanwhile, sales of SUVs, minivans, and pickup trucks were gradually edging out cars. Between these two trends, the fuel efficiency of new light-duty vehicles fell fairly steadily from 1987 all the way through 2004. It was only in 2007 or so, after SUV sales had cooled a bit, that the average new vehicle was as efficient as the one it was replacing. (See this Department of Energy spreadsheet for details.)

So saying that a decade's worth of flat gas consumption was due to improving vehicle efficiency is simply an error; the trend included a long period of declining average mpg, and a shorter period, particularly after 2008, when the average mpg of the vehicle fleet improved. For the most part, the trend of flat-lining gas consumption is explained by the flat-lining in state-wide VMT.

To me, what this points out is the danger of relying on intuition and hearsay instead of hard data. Intuition says that we're driving more than ever, so any declines in gas consumption *must* be due to more efficient vehicles. Reality, however, tells a different story: person for person, we're driving less; total vehicle travel is holding roughly steady; and the gains in vehicle efficiency have been real, but more modest and more recent than you might think.

Previous post in series:
- Peak Gas Hits Oregon

Comments

rex burkholder says:

October 7, 2011 at 10:43 am

P-047-014 An interesting area to investigate for you is that, within the Metro region, there has been very little addition to the state highway network in the last 10 years. I would daresay that in Multnomah County, actual miles in the state system have declined as local governments assume control of large sections of state highways, including MLK Blvd (ex-99E), Sandy (ex-30).

There is also the phenomena, seen on the I-5 crossing data, that roads do fill up, and more vehicles on the road is just physically impossible as well as deterring to additional traffic.

We shouldn't be surprised that we get flat lining of traffic growth on a facility when we've stopped adding to the size of those facilities. I'd be interested in what has happened in WA state which has had the money and the push to add lots of new capacity in the last 10 years. Is driving plateauing???

Reply

Jesse says:
October 7, 2011 at 2:12 pm

Rex,
Check out the rest of the "Dude, Where's My Cars?" series. Most is about Washington.

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TECHNICAL ADVISORY

GUIDANCE FOR PREPARING AND PROCESSING ENVIRONMENTAL AND SECTION 4(F) DOCUMENTS

T 6640.8A
October 30, 1987

P-047-014

1. PURPOSE. To provide guidance to Federal Highway Administration (FHWA) field offices and to project applicants on the preparation and processing of environmental and Section 4(f) documents.

2. CANCELLATION. Technical Advisory T 6640.8, "Guidance Material for the Preparation of Environmental Documents," dated February 24, 1982, is canceled effective on November 27, 1987.

3. APPLICABILITY

   a. This material is not regulatory. It has been developed to provide guidance for uniformity and consistency in the format, content, and processing of the various environmental studies and documents pursuant to the National Environmental Policy Act (NEPA), 23 U.S.C.109(h) and 23 U.S.C. 138 (Section 4(f) of the DOT Act) and the reporting requirements of 23 U.S.C. 128.

   b. The guidance is limited to the format, content and processing of NEPA and Section 4(f) studies and documents. It should be used in combination with a knowledge and understanding of the Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (40 CFR 1500-1508), FHWA's Environmental Impact and Related Procedures (23 CFR 771) and other environmental statutes and orders (see Appendix A).

   c. This guidance should not be used until November 27, 1987, the effective date of the 1987 revisions to 23 CFR 771.

Ali F. Sevin
Director, Office of
Environmental Policy

GUIDANCE FOR PREPARING AND PROCESSING ENVIRONMENTAL AND SECTION 4(F) DOCUMENTS

Background

An earlier edition of this advisory (dated February 24, 1982) placed major emphasis on environmental impact statements (EISs) and provided limited guidance on environmental assessments (EAs) and other environmental studies needed for a categorical exclusion (CE) determination or a finding of no significant impact (FONSI). The revised guidance gives expanded coverage to CE determinations, EAs, FONSIs, EISs, supplemental EISs, reevaluations, and Section 4(f) evaluations. This material is not regulatory. It does, however, provide for uniformity and consistency in the documentation of CEs and the development of environmental and Section 4(f) documents.

The FHWA subscribes to the philosophy that the goal of the NEPA process is better decisions and not more

P-047-014

documentation. Environmental documents should be concise, clear, and to the point, and should be supported by evidence that the necessary analyses have been made. They should focus on the important impacts and issues with the less important areas only briefly discussed. The length of EAs should normally be less than 15 pages and EISs should normally be less than 150 pages for most proposed actions and not more than 300 pages for the most complex proposals. The use of technical reports for various subject areas would help reduce the size of the documents.

The FHWA considers the early coordination process to be a valuable tool in determining the scope of issues to be addressed and in identifying and focusing on the proposed action's important issues. This process normally entails the exchange of information with appropriate Federal, State and local agencies, and the public from inception of the proposed action to preparation of the environmental document or to completion of environmental studies for applicable CEs. Formal scoping meetings may also be held where such meetings would assist in the preparation of the environmental document. The role of other agencies and other environmental review and consultation requirements should be established during scoping. The Council on Environmental Quality (CEQ) has issued several guidance publications on NEPA and its regulations as follows: (1) "Questions and Answers about the NEPA Regulations," March 30, 1981; (2) "Scoping Guidance," April 30, 1981; and (3) "GuidanceRegarding NEPA Regulations," July 28, 1983. This nonregulatory guidance is used by FHWA in preparing and processing environmental documents. Copies of the CEQ guidance are available in the FHWA Office of Environmental Policy (HEV-11).

Note, highway agency (HA) is used throughout this document to refer to a State and local highway agency responsible for conducting environmental studies and preparing environmental documents and to FHWA's Office of Direct Federal Programs when that office acts in a similar capacity.

SECTION SUBJECT

I Categorical Exclusion (CE) 4
II Environmental Assessment (EA) 6
III Finding of No Significant Impact (FONSI) 9
IV Distribution of EAs and FONSIs 10
V EIS -- Format and Content 11
Cover Sheet 11
Summary 12
Table of Contents. 13
Purpose of and Need for Action 13
Alternatives 15
Affected Environment 18
Environmental Consequences 19
Land Use Impacts 20
Farmland Impacts 21
Social Impacts 21
Relocation Impacts. 23
Economic Impacts 24
Joint Development 25
Considerations Relating to Pedestrians and Bicyclists 25
Air Quality Impacts 26
Noise Impacts 28
Water Quality Impacts 29
Permits 30
Wetland Impacts 31
Water Body Modification and Wildlife Impacts. . 33
Floodplain Impacts. 33
Wild and Scenic Rivers. 35
Coastal Barriers 35
Coastal Zone Impacts 36
Threatened or Endangered Species 37
Historic and Archeological Preservation 39
Hazardous Waste Sites 40
Visual Impacts 41
Energy 41
Construction Impacts 42
Relationship of Local Short-term Uses vs. Long-term Productivity 42
Irreversible and Irretrievable Commitment of Resources 43

P-047-014

List of Preparers 44
List of Agencies, Organizations and Persons to Whom Copies of the Statement are Sent 44
Comments and Coordination 44
Index 45
Appendices 45
VI Options for Preparing Final EISs 46
VII Distribution of EISs and Section 4(f) Evaluations 48
VIII Record of Decision -- Format and Content 50
IX Section 4(f) Evaluations -- Format and Content 52
X Other Agency Statements 56
XI Reevaluations 57
XII Supplemental EISs 59
XIII Appendices: 60

CATEGORICAL EXCLUSION (CE)

Categorical exclusions are actions or activities which meet the definition in 23 CFR 771.117(a) and, based on FHWA's past experience, do not have significant environmental effects. The CEs are divided into two groups based on the action's potential for impacts. The level of documentation necessary for a particular CE depends on the group the action falls under as explained below.

A. Documentation of Applicability

The first group is a list of 20 categories of actions in 23 CFR 771.117(c) which experience has shown never or almost never cause significant environmental impacts. These categories are non-construction actions (e.g., planning, grants for training and research programs) or limited construction activities (e.g., pedestrian facilities, landscaping, fencing). These actions are automatically classified as CEs, and except where unusual circumstances are brought to FHWA's attention, do not require approval or documentation by FHWA. However, other environmental laws may still apply. For example, installation of traffic signals in a historic district may require compliance with Section 106, or a proposed noise barrier which would use land protected by Section 4(f) would require preparation of a Section 4(f) evaluation (23 CFR 771.135(i)). In most cases, information is available from planning and programming documents for the FHWA Division Office to determine the applicability of other environmental laws. However, any necessary documentation should be discussed and developed cooperatively by the highway agency (HA) and the FHWA.

The second group consists of actions with a higher potential for impacts than the first group, but due to minor environmental impacts still meets the criteria for categorical exclusions. In 23 CFR 771.117(d), the regulation lists examplesof 12 actions which past experience has found appropriate for CE classification. However, the second group is not limited to these 12 examples. Other actions with a similar scope of work may qualify as CEs. For actions in this group, site location is often a key factor. Some of these actions on certain sites may involve unusual circumstances or result in significant adverse environmental impacts. Because of the potential for impacts, these actions require some information to be provided by the HA so that the FHWA can determine if the CE classification is proper (23 CFR 771.117(d)). The level of information to be provided should be commensurate with the action's potential for adverse environmental impacts. Where adverse environmental impacts are likely to occur, the level of analysis should be sufficient to define the extent of impacts, identify appropriate mitigation measures, and address known and foreseeable public and agency concerns. As a minimum, the information should include a description of the proposed action and, as appropriate, its immediate surrounding area, a discussion of any specific areas of environmental concern (e.g., Section 4(f), wetlands, relocations), and a list of other Federal actions required, if any, for the proposal.

The documentation of the decision to advance an action in the second group as a CE can be accomplished by one of the following methods:

1. Minor actions from the list of examples:

P-047-014

Minor construction projects or approval actions need only minimum documentation. Where project-specific information for such minor construction projects is included with the Section 105 program and clearly shows that the project is one of the 12 listed examples in Section 771.117(d), the approval of the Section 105 program can be used to approve the projects as CEs. Similarly, the three approval actions on the list (examples (6), (7) and (12)) should not normally require detailed documentation, and the CE determination can be documented as a part of the approval action being requested.

2. Other actions from the list of examples:

   For more complex actions, additional information and possibly environmental studies will be needed. This informationshould be furnished to the FHWA on a case-by-case basis for concurrence in the CE determination.

3. Actions not on the list of examples:

   Any action which meets the CE criteria in 23 CFR 771.117(a) may be classified as a CE even though it does not appear on the list of examples in Section 771.117(d). The actions on the list should be used as a guide to identify other actions that may be processed as CEs. The documentation to be submitted to the FHWA must demonstrate that the CE criteria are satisfied and that the proposed project will not result in significant environmental impacts. The classification decision should be documented as a part of the individual project submissions.

4. Consideration of Unusual Circumstances

   Section 771.117(b) lists those unusual circumstances where further environmental studies will be necessary to determine the appropriateness of a CE classification. Unusual circumstances can arise on any project normally advanced with a CE; however, the type and depth of additional studies will vary with the type of CE and the facts and circumstances of each situation. For those actions on the fixed list (first group) of CEs, unusual circumstances should rarely, if ever, occur due to the limited scope of work. Unless unusual circumstances come to the attention of the HA or FHWA, they need not be given further consideration. For actions in the second group of CEs, unusual circumstances should be addressed in the information provided to the FHWA with the request for CE approval. The level of consideration, analysis, and documentation should be commensurate with the action's potential for significant impacts, controversy, or inconsistency with other agencies' environmental requirements.

   When an action may involve unusual circumstances, sufficient early coordination, public involvement and environmental studies should be undertaken to determine the likelihood of significant impacts. If no significant impacts are likely to occur, the results of environmental studies and any agency and public involvement should adequately support such a conclusion and be included in the request to the FHWA for CE approval. If significant impacts are likely to occur, an EISmust be prepared (23 CFR 771.123(a)). If the likelihood of significant impacts is uncertain even after studies have been undertaken, the HA should consult with the FHWA to determine whether to prepare an EA or an EIS.

XIII ENVIRONMENTAL ASSESSMENT (EA)

The primary purpose of an EA is to help the FHWA and HA decide whether or not an EIS is needed. Therefore, the EA should address only those resources or features which the FHWA and the HA decide will have a likelihood for being significantly impacted. The EA should be a concise document and should not contain long descriptions or detailed information which may have been gathered or analyses which may have been conducted for the proposed action. Although the regulations do not set page limits, CEQ recommends that the length of EAs usually be less than 15 pages. To minimize volume, the EA should use good quality maps and exhibits and incorporate by reference and summarize background data and technical analyses to support the concise discussions of the alternatives and their impacts.

P-047-014 The following format and content is suggested:

A. Cover Sheet.

There is no required format for the EA. However, the EIS cover sheet format, as shown in Section V, is recommended as a guide. A document number is not necessary. The due date for comments should be omitted unless the EA is distributed for comments.

B. Purpose of and Need for Action.

Describe the locations, length, termini, proposed improvements, etc. Identify and describe the transportation or other needs which the proposed action is intended to satisfy (e.g., provide system continuity, alleviate traffic congestion, and correct safety or roadway deficiencies). In many cases the project need can be adequately explained in one or two paragraphs. On projects where a law, Executive Order, or regulation (e.g., Section 4(f), Executive Order 11990, or Executive Order 11988) mandates an evaluation of avoidance alternatives, the explanation of the project need should be morespecific so that avoidance alternatives that do not meet the stated project need can be readily dismissed.

C. Alternatives.

Discuss alternatives to the proposed action, including the no-action alternative, which are being considered. The EA may either discuss (1) the preferred alternative and identify any other alternatives considered or (2) if the applicant has not identified a preferred alternative, the alternatives under consideration. The EA does not need to evaluate in detail all reasonable alternatives for the project, and may be prepared for one or more build alternatives.

D. Impacts.

For each alternative being considered, discuss any social, economic, and environmental impacts whose significance is uncertain. The level of analysis should be sufficient to adequately identify the impacts and appropriate mitigation measures, and address known and foreseeable public and agency concerns. Describe why these impacts are considered not significant. Identified impact areas which do not have a reasonable possibility for individual or cumulative significant environmental impacts need not be discussed.

E. Comments and Coordination.

Describe the early and continuing coordination efforts, summarize the key issues and pertinent information received from the public and government agencies through these efforts, and list the agencies and, as appropriate, members of the public consulted.

F. Appendices (if any).

The appendices should include only analytical information that substantiates an analysis which is important to the document (e.g., a biological assessment for threatened or endangered species). Other information should be referenced only (i.e., identify the material and briefly describe its contents).

G. Section 4(f) Evaluation (if any).

If the EA includes a Section 4(f) evaluation, the EA/Section 4(f) evaluation or, if prepared separately, the Section 4(f) evaluation by itself must be circulated to the appropriate agencies for Section 4(f) coordination (23 CFR 771.135(i)). Section VII provides specific details on distribution and coordination of Section 4(f) evaluations. Section IX provides information on format and content of Section 4(f) evaluation.

If a programmatic Section 4(f) evaluation is used on the proposed project, this fact should be included and the Section 4(f) resource identified in the EA. The avoidance alternatives evaluation called for in Section 771.135(i) need not be repeated in the EA. Such evaluation would be part of

P-047-014

the documentation to support the applicability and findings of the programmatic document.

H. EA Revisions.

Following the public availability period, the EA should be revised or an attachment provided, as appropriate, to (1) reflect changes in the proposed action or mitigation measures resulting from comments received on the EA or at the public hearing (if one is held) and any impacts of the changes, (2) include any necessary findings, agreements, or determination (e.g., wetlands, Section 106, Section 4(f)) required for the proposal, and (3) include a copy of pertinent comments received on the EA and appropriate responses to the comments.

XXXIV. FINDING OF NO SIGNIFICANT IMPACT (FONSI)

The EA, revised or with attachment(s) (see paragraph above), is submitted by the HA to the FHWA along with (1) a copy of the public hearing transcript, when one is held, (2) a recommendation of the preferred alternative, and (3) a request that a finding of no significant impact be made. The basis for the HA's finding of no significant impact request should be adequately documented in the EA and any attachment(s).

After review of the EA and any other appropriate information, the FHWA may determine that the proposed action has no significant impacts. This is documented by attaching to the EA a separate statement (sample follows) which clearly sets forththe FHWA conclusions. If necessary, the FHWA may expand the sample FONSI to identify the basis for the decision, uses of land from Section 4(f) properties, wetland finding, etc.

The EA or FONSI should document compliance with NEPA and other applicable environmental laws, Executive Orders, and related requirements. If full compliance with these other requirements is not possible by the time the FONSI is prepared, the documents should reflect consultation with the appropriate agencies and describe when and how the requirements will be met. For example, any action requiring the use of Section 4(f) property cannot proceed until FHWA gives a Section 4(f) approval (49 U.S.C. 303(c)).

XXXV. DISTRIBUTION OF EAs AND FONSIs

A. Environmental Assessment

After clearance by FHWA, EAs must be made available for public inspection at the HA and FHWA Division offices (23 CFR 771.119(d)). Although only a notice of availability of the EA is required, the HA is encouraged to distribute a copy of the document with the notice to Federal, State, and local government agencies likely to have an interest in the undertaking and to the State intergovernmental review contacts. The HA should also distribute the EA to any Federal, State, or local agency known to have interest or special expertise (e.g., EPA for wetlands, water quality, air, noise, etc.) in those areas addressed in the EA which have or may have had potential for significant impact. The possible impacts and the agencies involved should be identified following the early coordination process. Where an individual permit would be required from the Corps of Engineers (COE) (i.e., Section 404 or Section 10) or from the Coast Guard (CG) (i.e., Section 9), a copy of the EA should be distributed to the involved agency in accordance with the U.S. Department of Transportation (DOT)/Corps of Engineers Memorandum of Agreement or the FHWA/U.S. Coast Guard Memorandum of Understanding, respectively. Any internal FHWA distribution will be determined by the Division Office on a case-by-case basis.

B. Finding of No Significant Impact

Formal distribution of a FONSI is not required. The HA must send a notice of availability of the FONSI to Federal, State, and local government agencies likely to have an interest in the undertaking and the State intergovernmental review contacts (23 CFR 771.121(b)). However, it is encouraged that agencies which commented on the EA (or requested to be informed) be advised of the project decision and the disposition of their comments and be provided a copy of the FONSI. This fosters good lines of communication and enhances interagency coordination.

P-047-014 LIE Environmental Impact Statement (EIS) -- FORMAT AND CONTENT

A. Cover Sheet

Each EIS should have a cover sheet containing the following information:

(EIS NUMBER)

Route, Termini, City or County, and State

Draft (Final) (Supplement)

Environmental Impact Statement

Submitted Pursuant to 42 U.S.C. 4332 (2) (c)(and where applicable, 49 U.S.C. 303) by the U.S. Department of Transportation, Federal Highway Administration and State Highway Agency and(As applicable, any other joint lead agency)

Cooperating Agencies (Include List Here, as applicable)

Date of Approval

For (State Highway Agency)

Date of Approval

For FHWA

The following persons may be contacted for additional information concerning this document:

(Name, address, and telephone number of FHWA Division Office contact)

(Name, address, and telephone number of HA contact)

A one-paragraph abstract of the statement.

Comments on this draft EIS are due by (date) and should be sent to (name and address).

The top left-hand corner of the cover sheet of all draft final and supplemental EISs contains an identification number. The following is an example:

FHWA-AZ-EIS-87-01-D(F)(S)

FHWA name of Federal agency

AZ name of State (cannot exceed four characters)

EIS environmental impact statement

87 year draft statement was prepared

01 sequential number of draft statement for each calendar year

D designates the statement as the draft statement

F designates the statement as the final statement

S designates supplemental statement and should be combined with draft (DS) or final (FS) statement designation. The year and sequential number will be the same as those used for the original draft EIS.

The EIS should be printed on 8 1/2 x 11-inch paper with any foldout sheets folded to that size. The

P-047-014

wider sheets should be 8 1/2 inches high and should open to the right with the title or identification on the right. The standard size is needed for administrative recordkeeping.

B. Summary

The summary should include:

1. A brief description of the proposed FHWA action indicating route, termini, type of improvement, number of lanes, length, county, city, State, and other information, as appropriate.
2. A description of any major actions proposed by other governmental agencies in the same geographic area as the proposed FHWA action.
3. A summary of all reasonable alternatives considered. (The draft EIS must identify the preferred alternative or alternatives officially identified by the HA (40 CFR 1502.14(e)). The final EIS must identify the preferred alternative and should discuss the basis for its selection (23 CFR 771.125(a)(1)).
4. A summary of major environmental impacts, both beneficial and adverse.
5. Any areas of controversy (including issues raised by agencies and the public).
6. Any major unresolved issues with other agencies.
7. A list of other Federal actions required for the proposed action (i.e., permit approvals, land transfer, Section 106 agreements, etc.).

C. Table of Contents

For consistency with CEQ regulations, the following standard format should be used:

1. Cover Sheet
2. Summary
3. Table of Contents
4. Purpose of and Need for Action
5. Alternatives
6. Affected Environment
7. Environmental Consequences
8. List of Preparers
9. List of Agencies, Organizations, and Persons to Whom Copies of the Statement are Sent
10. Comments and Coordination
11. Index
12. Appendices (if any)

D. Purpose of and Need for Action

Identify and describe the proposed action and the transportation problem(s) or other needs which it is intended to address (40 CFR 1502.13). This section should clearly demonstrate that a "need" exists and should define the "need" in terms understandable to the general public. This discussion

P-047-014

should clearly describe the problems which the proposed action is to correct. It will form the basis for the "no action" discussion in the "Alternatives" section, and assist with the identification of reasonable alternatives and the selection of the preferred alternative. Charts, tables, maps, and other illustrations (e.g., typical cross-section, photographs, etc.) are encouraged as useful presentation techniques.

The following is a list of items which may assist in the explanation of the need for the proposed action. It is by no means all-inclusive or applicable in every situation and is intended only as a guide.

1. Project Status - Briefly describe the project history including actions taken to date, other agencies and governmental units involved, action spending, schedules, etc.
2. System Linkage - Is the proposed project a "connecting link?" How does it fit in the transportation system?
3. Capacity - Is the capacity of the present facility inadequate for the present traffic? Projected traffic? What capacity is needed? What is the level(s) of service for existing and proposed facilities?
4. Transportation Demand - Including relationship to any statewide plan or adopted urban transportation plan together with an explanation of the project's traffic forecasts that are substantially different from those estimates from the 23 U.S.C. 134 (Section 134) planning process.
5. Legislation - Is there a Federal, State, or local governmental mandate for the action?
6. Social Demands or Economic Development - New employment, schools, land use plans, recreation, etc. What projected economic development/land use changes indicate the need to improve or add to the highway capacity?
7. Modal Interrelationships - How will the proposed facility interface with and serve to complement airports, rail and port facilities, mass transit services, etc.?
8. Safety - Is the proposed project necessary to correct an existing or potential safety hazard? Is the existing accident rate excessively high? Why? How will the proposed project improve it?
9. Roadway Deficiencies - Is the proposed project necessary to correct existing roadway deficiencies (e.g., substandard geometrics, load limits on structures, inadequate cross-section, or high maintenance costs)? How will the proposed project improve it?

E. Alternatives

This section of the draft EIS must discuss a range of alternatives, including all "reasonable alternatives" under consideration and those "other alternatives" which were eliminated from detailed study (23 CFR 771.123(c)). The section should begin with a concise discussion of how and why the "reasonable alternatives" were selected for detailed study and explain why "other alternatives" were eliminated. The following range of alternatives should be considered when determining reasonable alternatives:

1. "No-action" alternative: The "no-action" alternative normally includes short-term minor restoration types of activities (safety and maintenance improvements, etc.) that maintain continuing operation of the existing roadway.
2. Transportation System Management (TSM) alternative: The TSM alternative includes those activities which maximize the efficiency of the present system. Possible subject areas to include in this alternative are options such as fringe parking, ridesharing, high-occupancy vehicle (HOV) lanes on existing roadways, and traffic signal timing optimization. This limited construction alternative is usually relevant only for major projects proposed in urbanized

P-047-014

areas over 200,000 population.

For all major projects in these urbanized areas, HOV lanes should be considered. Consideration of this alternative may be accomplished by reference to the regional transportation plan, when that plan considers this option. Where a regional transportation plan does not reflect consideration of this option, it may be necessary to evaluate the feasibility of HOV lanes during early project development. Where a TSM alternative is identified as a reasonable alternative for a "connecting link" project, it should be evaluated to determine the effect that not building a highway link in the transportation plan will have on the remainder of the system. A similar analysis should be made where a TSM element(s) (e.g., HOV lanes) is part of a build alternative and reduces the scale of the highway link.

While the above discussion relates primarily to major projects in urbanized areas, the concept of achieving maximum utilization of existing facilities is equally important in rural areas. Before selecting an alternative on new location for major projects in rural areas, it is important to demonstrate that reconstruction and rehabilitation of the existing system will not adequately correct the identified deficiencies and meet the project need.

3. Mass Transit: This alternative includes those reasonable and feasible transit options (bus systems, rail, etc.) even though they may not be within the existing FHWA funding authority. It should be considered on all proposed major highway projects in urbanized areas over 200,000 population. Consideration of this alternative may be accomplished by reference to the regional or area transportation plan where that plan considers mass transit or by an independent analysis during early project development.

   Where urban projects are multi-modal and are proposed for Federal funding, close coordination is necessary with the Urban Mass Transportation Administration (UMTA). In these situations, UMTA should be consulted early in the project-development process. Where UMTA funds are likely to be requested for portions of the proposal, UMTA must be requested to be either a joint lead agency or a cooperating agency at the earliest stages of project development (23 CFR 771.111(d)). Where applicable, cost-effectiveness studies that have been performed should be summarized in the EIS.

4. Build alternatives: Both improvement of existing highway(s) and alternatives on new location should be evaluated. A representative number of reasonable alternatives must be presented and evaluated in detail in the draft EIS (40 CFR 1502.14(a)). For most major projects, there is a potential for a large number of reasonable alternatives. Where there is a large number of alternatives, only a representative number of the most reasonable examples, covering the full range ofalternatives, must be presented. The determination of the number of reasonable alternatives in the draft EIS, therefore, depends on the particular project and the facts and circumstances in each case.

   Each alternative should be briefly described using maps or other visual aids such as photographs, drawings, or sketches to help explain the various alternatives. The material should provide a clear understanding of each alternative's termini, location, costs, and the project concept (number of lanes, right-of-way requirements, median width, access control, etc.). Where land has been or will be reserved or dedicated by local government(s), donated by individuals, or acquired through advanced or hardship acquisition for use as highway right-of-way for any alternative under consideration, the draft EIS should identify the status and extent of such property and the alternatives involved. Where such lands are reserved, the EIS should state that the reserved lands will not influence the alternative to be selected.

   Development of more detailed design for some aspects (e.g., Section 4(f), COE or CG permits, noise, wetlands, etc.) of one or more alternatives may be necessary during preparation of the draft and final EIS in order to evaluate impacts or mitigation measures or to address issues raised by other agencies or the public. However, care should be taken to avoid unnecessarily specifying features which preclude cost-effective final design options.

   All reasonable alternatives under consideration (including the no-build) need to be developed

P-047-014

to a comparable level of detail in the draft EIS so that their comparative merits may be evaluated (40 CFR 1502.14(b) and (d)). In those situations where the HA has officially identified a "preferred" alternative based on its early coordination and environmental studies, the HA should so indicate in the draft EIS. In these instances, the draft EIS should include a statement indicating that the final selection of an alternative will not be made until the alternatives' impacts and comments on the draft EIS and from the public hearing (if held) have been fully evaluated. Where a preferred alternative has not been identified, the draft EIS should state that all reasonable alternatives are underconsideration and that a decision will be made after the alternatives' impacts and comments on the draft EIS and from the public hearing (if held) have been fully evaluated.

The final EIS must identify the preferred alternative and should discuss the basis for its selection (23 CFR 771.125(a)(1)). The discussion should provide the information and rationale identified in Section VIII (Record of Decision), paragraph (B). If the preferred alternative is modified after the draft EIS, the final EIS should clearly identify the changes and discuss the reasons why any new impacts are not significant.

F. Affected Environment

This section provides a concise description of the existing social, economic, and environmental setting for the area affected by all alternatives presented in the EIS. Where possible, the description should be a single description for the general project area rather than a separate one for each alternative. The general population served and/or affected (city, county, etc.) by the proposed action should be identified by race, color, national origin, and age. Demographic data should be obtained from available secondary sources (e.g., census data, planning reports) unless more detailed information is necessary to address specific concerns. All socially, economically, and environmentally sensitive locations or features in the proposed project impact area (e.g., neighborhoods, elderly/minority/ ethnic groups, parks, hazardous material sites, historic resources, wetlands, etc.), should be identified on exhibits and briefly described in the text. However, it may be desirable to exclude from environmental documents the specific location of archeological sites to prevent vandalism.

To reduce paperwork and eliminate extraneous background material, the discussion should be limited to data, information, issues, and values which will have a bearing on possible impacts, mitigation measures, and on the selection of an alternative. Data and analyses should be commensurate with the importance of the impact, with the less important material summarized or referenced rather than be reproduced. Photographs, illustrations, and other graphics should be used with the text to give a clear understanding of the area and the important issues. Other Federal activities which contribute to the significance of the proposed action's impacts should be described.

This section should also briefly describe the scope and status of the planning processes for the local jurisdictions and the project area. Maps of any adopted land use and transportation plans for these jurisdictions and the project area would be helpful in relating the proposed project to the planning processes.

G. Environmental Consequences

This section includes the probable beneficial and adverse social, economic, and environmental effects of alternatives under consideration and describes the measures proposed to mitigate adverse impacts. The information should have sufficient scientific and analytical substance to provide a basis for evaluating the comparative merits of the alternatives. The discussion of the proposed project impacts should not use the term significant in describing the level of impacts. There is no benefit to be gained from its use. If the term significant is used, however, it should be consistent with the CEQ definition and be supported by factual information.

There are two principal ways of preparing this section. One is to discuss the impacts and mitigation measures separately for each alternative with the alternatives as headings. The second (which is advantageous where there are few alternatives or where impacts are similar for the various alternatives) is to present this section with the impacts as the headings. Where appropriate, a

P-047-014

sub-section should be included which discusses the general impacts and mitigation measures that are the same for the various alternatives under consideration. This would reduce or eliminate repetition under each of the alternative discussions. Charts, tables, maps, and other graphics illustrating comparisons between the alternatives (e.g., costs, residential displacements, noise impacts, etc.) are useful as a presentation technique.

When preparing the final EIS, the impacts and mitigation measures of the alternatives, particularly the preferred alternative, may need to be discussed in more detail to elaborate on information, firm-up commitments, or address issues raised following the draft EIS. The final EIS should also identify anynew impacts (and their significance) resulting from modification of or identification of substantive new circumstances or information regarding the preferred alternative following the draft EIS circulation. Note: Where new significant impacts are identified a supplemental draft EIS is required (40 CFR 1502.9(c)).

The following information should be included in both the draft and final EIS for each reasonable alternative:

1. A summary of studies undertaken, any major assumptions made and supporting information on the validity of the methodology (where the methodology is not generally accepted as state-of-the-art).

2. Sufficient supporting information or results of analyses to establish the reasonableness of the conclusions on impacts.

3. A discussion of mitigation measures. These measures normally should be investigated in appropriate detail for each reasonable alternative so they can be identified in the draft EIS. The final EIS should identify, describe and analyze all proposed mitigation measures for the preferred alternative.

In addition to normal FHWA program monitoring of design and construction activities, special instances may arise when a formal program for monitoring impacts or implementation of mitigation measures will be appropriate. For example, monitoring ground or surface waters that are sources for drinking water supply; monitoring noise or vibration of nearby sensitive activities (e.g., hospitals, schools); or providing on-site professional archeologist to monitor excavation activities in highly sensitive archeological areas. In these instances, the final EIS should describe the monitoring program.

1. A discussion, evaluation and resolution of important issues on each alternative. If important issues raised by other agencies on the preferred alternative remain unresolved,the final EIS must identify those issues and the consultations and other efforts made to resolve them (23 CFR 771.125(a)(2)).

   Listed below are potentially significant impacts most commonly encountered by highway projects. These factors should be discussed for each reasonable alternative where a potential for impact exists. This list is not all-inclusive and on specific projects there may be other impact areas that should be included.

2. Land Use Impacts

   This discussion should identify the current development trends and the State and/or local government plans and policies on land use and growth in the area which will be impacted by the proposed project.

   These plans and policies are normally reflected in the area's comprehensive development plan, and include land use, transportation, public facilities, housing, community services, and other areas.

   The land use discussion should assess the consistency of the alternatives with the comprehensive development plans adopted for the area and (if applicable) other plans used

P-047-014

in the development of the transportation plan required by Section 134. The secondary social, economic, and environmental impacts of any substantial, foreseeable, induced development should be presented for each alternative, including adverse effects on existing communities. Where possible, the distinction between planned and unplanned growth should be identified.

3. Farmland Impacts

Farmland includes 1) prime, 2) unique, 3) other than prime or unique that is of statewide importance, and 4) other than prime or unique that is of local importance.

The draft EIS should summarize the results of early consultation with the Soil Conservation Service (SCS) and, as appropriate, State and local agriculture agencies where any of the four specified types of farmland could be directly orindirectly impacted by any alternative under consideration. Where farmland would be impacted, the draft EIS should contain a map showing the location of all farmlands in the project impact area, discuss the impacts of the various alternatives and identify measures to avoid or reduce the impacts. Form AD 1006 (Farmland Conversion Impact Rating) should be processed, as appropriate, and a copy included in the draft EIS. Where the Land Evaluation and Site Assessment score (from Form AD 1006) is 160 points or greater, the draft EIS should discuss alternatives to avoid farmland impacts.

If avoidance is not possible, measures to minimize or reduce the impacts should be evaluated and, where appropriate, included in the proposed action.

4. Social Impacts

Where there are foreseeable impacts, the draft EIS should discuss the following items for each alternative commensurate with the level of impacts and to the extent they are distinguishable:

(a) Changes in the neighborhoods or community cohesion for the various social groups as a result of the proposed action. These changes may be beneficial or adverse, and may include splitting neighborhoods, isolating a portion of a neighborhood or an ethnic group, generating new development, changing property values, or separating residents from community facilities, etc.

(b) Changes in travel patterns and accessibility (e.g., vehicular, commuter, bicycle, or pedestrian).

(c) Impacts on school districts, recreation areas, churches, businesses, police and fire protection, etc. This should include both the direct impacts to these entities and the indirect impacts resulting from the displacement of households and businesses.

(d) Impacts of alternatives on highway and traffic safety as well as on overall public safety.

(e) General social groups specially benefitted or harmed by the proposed project. The effects of a project on the elderly, handicapped, nondrivers, transit-dependent, and minority and ethnic groups are of particular concern and should be described to the extent these effects can be reasonably predicted. Where impacts on a minority or ethnic population are likely to be an important issue, the EIS should contain the following information broken down by race, color, and national origin: the population of the study area, the number of displaced residents, the type and number of displaced businesses, and an estimate of the number of displaced employees in each business sector. Changes in ethnic or minority employment opportunities should be discussed and the relationship of the project to other Federal actions which may serve or adversely affect the ethnic or minority population should be identified.

The discussion should address whether any social group is disproportionally impacted

P-047-014

and identify possible mitigation measures to avoid or minimize any adverse impacts. Secondary sources of information such as census and personal contact with community leaders supplemented by visual inspections normally should be used to obtain the data for this analysis. However, for projects with major community impacts, a survey of the affected area may be needed to identify the extent and severity of impacts on these social groups.

5. Relocation Impacts

The relocation information should be summarized in sufficient detail to adequately explain the relocation situation including anticipated problems and proposed solutions. Project relocation documents from which information is summarized shouldbe referenced in the draft EIS. Secondary sources of information such as census, economic reports, and contact with community leaders, supplemented by visual inspections (and, as appropriate, contact with local officials) may be used to obtain the data for this analysis. Where a proposed project will result in displacements, the following information regarding households and businesses should be discussed for each alternative under consideration commensurate with the level of impacts and to the extent they are likely to occur:

(a) An estimate of the number of households to be displaced, including the family characteristics (e.g., minority, ethnic, handicapped, elderly, large family, income level, and owner/tenant status). However, where there are very few displacees, information on race, ethnicity and income levels should not be included in the EIS to protect the privacy of those affected.

(b) A discussion comparing available (decent, safe, and sanitary) housing in the area with the housing needs of the displacees. The comparison should include (1) price ranges, (2) sizes (number of bedrooms), and (3) occupancy status (owner/tenant).

(c) A discussion of any affected neighborhoods, public facilities, non-profit organizations, and families having special composition (e.g., ethnic, minority, elderly, handicapped, or other factors) which may require special relocation considerations and the measures proposed to resolve these relocation concerns.

(d) A discussion of the measures to be taken where the existing housing inventory is insufficient, does not meet relocation standards, or is not within the financial capability of the displacees. A commitment to last resort housing should be includedwhen sufficient comparable replacement housing may not be available.

(e) An estimate of the numbers, descriptions, types of occupancy (owner/tenant), and sizes (number of employees) of businesses and farms to be displaced. Additionally, the discussion should identify (1) sites available in the area to which the affected businesses may relocate, (2) likelihood of such relocation, and (3) potential impacts on individual businesses and farms caused by displacement or proximity of the proposed highway if not displaced.

(f) A discussion of the results of contacts, if any, with local governments, organizations, groups, and individuals regarding residential and business relocation impacts, including any measures or coordination needed to reduce general and/or specific impacts. These contacts are encouraged for projects with large numbers of relocatees or complex relocation requirements. Specific financial and incentive programs or opportunities (beyond those provided by the Uniform Relocation Act) to residential and business relocatees to minimize impacts may be identified, if available through other agencies or organizations.

(g) A statement that (1) the acquisition and relocation program will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and (2) relocation resources are available to all residential and business relocatees without discrimination.

P-047-014

6. Economic Impacts

Where there are foreseeable economic impacts, the draft EIS should discuss the following for each alternative commensurate with the level of impacts:

(a) The economic impacts on the regional and/or local economy such as the effects of the project on development, tax revenues and public expenditures, employment opportunities, accessibility, and retail sales. Where substantial impacts on the economic viability of affected municipalities are likely to occur, they should also be discussed together with a summary of any efforts undertaken and agreements reached for using the transportation investment to support both public and private economic development plans. To the extent possible, this discussion should rely upon results of coordination with and views of affected State, county, and city officials and upon studies performed under Section 134.

(b) The impacts on the economic vitality of existing highway-related businesses (e.g., gasoline stations, motels, etc.) and the resultant impact, if any, on the local economy. For example, the loss of business or employment resulting from building an alternative on new location bypassing a local community.

(c) Impacts of the proposed action on established business districts, and any opportunities to minimize or reduce such impacts by the public and/or private sectors. This concern is likely to occur on a project that might lead to or support new large commercial development outside of a central business district.

7. Joint Development

Where appropriate, the draft EIS should identify and discuss those joint development measures which will preserve or enhance an affected community's social, economic, environmental, and visual values. This discussion may be presented separately or combined with the land use and/or social impacts presentations. The benefits to be derived, those who will benefit (communities, social groups, etc.), and the entities responsible for maintaining the measures should be identified.

8. Considerations Relating to Pedestrians and Bicyclists

Where current pedestrian or bicycle facilities or indications of use are identified, the draft EIS should discuss the current and anticipated use of the facilities, the potential impacts of the affected alternatives, and proposed measures, if any, to avoid or reduce adverse impacts to the facility(ies) and its users. Where new facilities are proposed as a part of the proposed highway project, the EIS should include sufficient information to explain the basis for providing the facilities (e.g., proposed bicycle facility is a link in the local plan or sidewalks will reduce project access impact to the community). The final EIS should identify those facilities to be included in the preferred alternative. Where the preferred alternative would sever an existing major route for non-motorized transportation traffic, the proposed project needs to provide a reasonably alternative route or demonstrate that such a route exists (23 U.S.C. 109(n)). To the fullest extent possible, this needs to be described in the final EIS.

8. Air Quality Impacts

The draft EIS should contain a brief discussion of the transportation-related air quality concerns in the project area and a summary of the project- related carbon monoxide (CO) analysis if such analysis is performed. The following information should be presented, as appropriate.

(a) Mesoscale Concerns: Ozone (O_3), Hydrocarbons (HC), and Nitrogen Oxide (NO_X) air quality concerns are regional in nature and as such meaningful evaluation on a project-by-project basis is not possible. Where these pollutants are an issue, the air quality emissions inventories in the State Implementation Plan (SIP) should be

P-047-014

referenced and briefly summarized in the draft EIS. Further, the relationship of the project to the SIP should be described in the draft EIS by including one of the following statements:

1 This project is in an area where the SIP does not contain any transportation control measures. Therefore, the conformity procedures of 23 CFR 770 do not apply to this project.

2 This project is in an area which has transportation control measures in the SIP which was (conditionally) approved by the Environmental Protection Agency (EPA) on (date). The FHWA has determined that both the transportation plan and the transportation improvement program conform to the SIP. The FHWA has determined that this project is included in the transportation improvement program for the (indicate 3C planning area). Therefore, pursuant to 23 CFR 770, this project conforms to the SIP.

Under certain circumstances, neither of these statements will precisely fit the situation and may need to be modified. Additionally, if the project is a Transportation Control Measure from the SIP, this should be highlighted to emphasize the project's air quality benefits.

(b) Microscale Concerns: Carbon monoxide is a project- related concern and as such should be evaluated in the draft EIS. A microscale CO analysis is unnecessary where such impacts (project CO contribution plus background) can be judged to be well below the 1- and 8-hour National Ambient AirQuality Standards (or other applicable State or local standards). This judgment may be based on (1) previous analyses for similar projects; (2) previous general analyses for various classes of projects; or (3) simplified graphical or "look-up" table evaluations. In these cases, a brief statement stating the basis for the judgment is sufficient.

For those projects where a microscale CO analysis is performed, each reasonable alternative should be analyzed for the estimated time of completion and design year. A brief summary of the methodologies and assumptions used should be included in the draft EIS. Lengthy discussions, if needed, should be included in a separate technical report and referenced in the EIS. Total CO concentrations (project contribution plus estimated background) at identified reasonable receptors for each alternative should be reported. A comparison should be made between alternatives and with applicable State and national standards. Use of a table for this comparison is recommended for clarity.

As long as the total predicted 1-hour CO concentration is less than 9 ppm (the 8-hour CO standard), no separate 8-hour analysis is necessary. If the 1-hour CO concentration is greater than 9 ppm, an 8-hour analysis should be performed. Where the preferred alternative would result in violations of the 1 or 8-hour CO standards, an effort should be made to develop reasonable mitigation measures through early coordination between FHWA, EPA, and appropriate State and local highway and air quality agencies. The final EIS should discuss the proposed mitigation measures and include evidence of the coordination.

9. Noise Impacts

The draft EIS should contain a summary of the noise analysis including the following for each alternative under detailed study:

(a) A brief description of noise sensitive areas (residences, businesses, schools,parks, etc.), including information on the number and types of activities which may be affected. This should include developed lands and undeveloped lands for which development is planned, designed, and programmed.

P-047-014

(b) The extent of the impact (in decibels) at each sensitive area. This includes a comparison of the predicted noise levels with both the FHWA noise abatement criteria and the existing noise levels. (Traffic noise impacts occur when the predicted traffic noise levels approach or exceed the noise abatement criteria or when they substantially exceed the existing noise levels). Where there is a substantial increase in noise levels, the HA should identify the criterion used for defining "substantial increase." Use of a table for this comparison is recommended for clarity.

(c) Noise abatement measures which have been considered for each impacted area and those measures that are reasonable and feasible and that would "likely" be incorporated into the proposed project. Estimated costs, decibel reductions and height and length of barriers should be shown for all abatement measures.

Where it is desirable to qualify the term "likely," the following statement or similar wording would be appropriate. "Based on the studies completed to date, the State intends to install noise abatement measures in the form of a barrier at (location(s)). These preliminary indications of likely abatement measures are based upon preliminary design for a barrier of _____ high and _____ long and a cost of $_____ that will reduce the noise level by _____ dBA for _____ residences (businesses, schools, parks, etc.). (Where there is more than one barrier, provide information for each one.) If during final design these conditions substantially change, the abatement measures might not be provided. A final decision onthe installation of abatement measure(s) will be made upon completion of the project design and the public involvement process."

(d) Noise impacts for which no prudent solution is reasonably available and the reasons why.

10. Water Quality Impacts

The draft EIS should include summaries of analyses and consultations with the State and/or local agency responsible for water quality. Coordination with the EPA under the Federal Clean Water Act may also provide assistance in this area. The discussion should include sufficient information to describe the ambient conditions of streams and water bodies which are likely to be impacted and identify the potential impacts of each alternative and proposed mitigation measures. Under normal circumstances, existing data may be used to describe ambient conditions. The inclusion of water quality data spanning several years is encouraged to reflect trends.

The draft EIS should also identify any locations where roadway runoff or other nonpoint source pollution may have an adverse impact on sensitive water resources such as water supply reservoirs, ground water recharge areas, and high quality streams. The 1981 FHWA research report entitled "Constituents of Highway Runoff," the 1985 report entitled "Management Practices for Mitigation of Highway Stormwater Runoff Pollution," and the 1987 report entitled "Effects of Highway Runoff on Receiving Waters" contain procedures for estimating pollutant loading from highway runoff and would be helpful in determining the level of potential impacts and appropriate mitigative measures. The draft EIS should identify the potential impacts of each alternative and proposed mitigation measures.

Where an area designated as principal or sole-source aquifer under Section 1424(e) of the Safe Drinking Water Act may be impacted by a proposed project, early coordination with EPA will assist in identifying potential impacts. The EPA will furnish information on whether any of the alternatives affect the aquifer. This coordination should also identify any potential impacts to the critical aquifer protection area (CAPA), if designated, within affected sole-source aquifers. If none of thealternatives affect the aquifer, the requirements of the Safe Drinking Water Act are satisfied. If an alternative is selected which affects the aquifer, a design must be developed to assure, to the satisfaction of EPA, that it will not contaminate the aquifer (40 CFR 149). The draft EIS should document coordination with EPA and identify its position on the impacts of the various alternatives. The final EIS should show that EPA's

P-047-014

concerns on the preferred alternative have been resolved.

Wellhead protection areas were authorized by the 1986 Amendments to the Safe Drinking Water Act. Each State will develop State wellhead protection plans with final approval by EPA. When a proposed project encroaches on a wellhead protection area, the draft EIS should identify the area, the potential impact of each alternative and proposed mitigation measures. Coordination with the State agency responsible for the protection plan will aid in identifying the areas, impacts and mitigation. If the preferred alternative impacts these areas, the final EIS should document that it complies with the approved State wellhead protection plan.

11. Permits

If a facility such as a safety rest area is proposed and it will have a point source discharge, a Section 402 permit will be required for point source discharge (40 CFR 122). The draft EIS should discuss potential adverse impacts resulting from such proposed facilities and identify proposed mitigation measures. The need for a Section 402 permit and Section 401 water quality certification should be identified in the draft EIS.

For proposed actions requiring a Section 404 or Section 10 (Corps of Engineers) permit, the draft EIS should identify by alternative the general location of each dredge or fill activity, discuss the potential adverse impacts, identify proposed mitigation measures (if not addressed elsewhere in the draft EIS), and include evidence of coordination with the Corps of Engineers (in accordance with the U.S. DOT/Corps of Engineers Memorandum of Agreement) and appropriate Federal, State and local resource agencies, and State and local water quality agencies. Where the preferred alternative requires an individual Section 404 or Section 10 permit, the final EIS should identify for eachpermit activity the approximate quantities of dredge or fill material, general construction grades and proposed mitigation measures.

For proposed actions requiring Section 9 (U.S. Coast Guard bridge) permits, the draft EIS should identify by alternative the location of the permit activity, potential impacts to navigation and the environment (if not addressed elsewhere in the document), proposed mitigation measures and evidence coordination with the U.S. Coast Guard (in accordance with the FHWA/U.S. Coast Guard Memorandum of Understanding). Where the preferred alternative requires a Section 9 permit, the final EIS should identify for each permit activity the proposed horizontal and vertical navigational clearances and include an exhibit showing the various dimensions.

For all permit activities the final EIS should include evidence that every reasonable effort has been made to resolve the issues raised by other agencies regarding the permit activities. If important issues remain unresolved, the final EIS must identify those issues, the positions of the respective agencies on the issues and the consultations and other efforts made to resolve them (23 CFR 771.125(a)).

12. Wetland Impacts

When an alternative will impact wetlands the draft EIS should (1) identify the type, quality, and function of wetlands involved, (2) describe the impacts to the wetlands, (3) evaluate alternatives which would avoid these wetlands, and (4) identify practicable measures to minimize harm to the wetlands. Wetlands should be identified by using the definition of 33 CFR 328.3(b) (issued on November 13, 1986) which requires the presence of hydrophytic vegetation, hydric soils and wetland hydrology. Exhibits showing wetlands in the project impact area in relation to the alternatives, should be provided.

In evaluating the impact of the proposed project on wetlands, the following two items should be addressed: (1) the importance of the impacted wetland(s) and (2) the severity of this impact. Merely listing the number of acres taken by the various alternatives of a highway proposal does not provide sufficient information upon which to determine the degree

P-047-014

ofimpact on the wetland ecosystem. The wetlands analysis should be sufficiently detailed to provide an understanding of these two elements.

In evaluating the importance of the wetlands, the analysis should consider such factors as: (1) the primary functions of the wetlands (e.g., flood control, wildlife habitat, ground water recharge, etc.), (2) the relative importance of these functions to the total wetland resource of the area, and (3) other factors such as uniqueness that may contribute to the wetlands importance.

In determining the wetland impact, the analysis should show the project's effects on the stability and quality of the wetland(s). This analysis should consider the short- and long-term effects on the wetlands and the importance of any loss such as: (1) flood control capacity, (2) shore line anchorage potential, (3) water pollution abatement capacity, and (4) fish and wildlife habitat value. The methodology developed by FHWA and described in reports numbered FHWA-IP-82-23 and FHWA IP-82-24, "A Method for Wetland Functional Assessment Volumes I and II," is recommended for use in conducting this analysis. Knowing the importance of the wetlands involved and the degree of the impact, the HA and FHWA will be in a better position to determine the mitigation efforts necessary to minimize harm to these wetlands. Mitigation measures which should be considered include preservation and improvement of existing wetlands and creation of new wetlands (consistent with 23 CFR 777).

If the preferred alternative is located in wetlands, to the fullest extent possible, the final EIS needs to contain the finding required by Executive Order 11990 that there are no practicable alternatives to construction in wetlands. Where the finding is included, approval of the final EIS will document compliance with the Executive Order 11990 requirements (23 CFR 771.125(a)(1)). The finding should be included in a separate subsection entitled "Only Practicable Alternative Finding" and should be supported by the following information:

(a) a reference to Executive Order 11990;

(b) an explanation why there are no practicable alternatives to the proposed action;

(c) an explanation why the proposed action includes all practicable measures to minimize harm to wetlands; and

(d) a concluding statement that: "Based upon the above considerations, it is determined that there is no practicable alternative to the proposed construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use."

13. Water Body Modification and Wildlife Impacts

For each alternative under detailed study the draft EIS should contain exhibits and discussions identifying the location and extent of water body modifications (e.g., impoundment, relocation, channel deepening, filling, etc.). The use of the stream or body of water for recreation, water supply, or other purposes should be identified. Impacts to fish and wildlife resulting from the loss degradation, or modification of aquatic or terrestrial habitat should also be discussed. The results of coordination with appropriate Federal, State and local agencies should be documented in the draft EIS. For example, coordination with FWS under the Fish and Wildlife Coordination Act of 1958.

14. Floodplain Impacts

National Flood Insurance Program (NFIP) maps or, if NFIP maps are not available, information developed by the highway agency should be used to determine whether an alternative will encroach on the base (100-year) floodplain. The location hydraulic studies required by 23 CFR 650, Subpart A, must include a discussion of the following items commensurate with the level of risk or environmental impact, for each alternative which

P-047-014

encroaches on base floodplains or would support base floodplain development:

(a) The flooding risks;

(b) The impacts on natural and beneficial floodplain values;

(c) The support of probable incompatible floodplain development (i.e., any development that is not consistent with a community's floodplain development plan);

(d) The measures to minimize floodplain impacts; and

(e) The measures to restore and preserve the natural and beneficial floodplain values.

The draft EIS should briefly summarize the results of the location hydraulic studies. The summary should identify the number of encroachments and any support of incompatible floodplain developments and their potential impacts. Where an encroachment or support of incompatible floodplain development results in substantial impacts, the draft EIS should provide more detailed information on the location, impacts and appropriate mitigation measures. In addition, if any alternative (I) results in a floodplain encroachment or supports incompatible floodplain development having significant impacts, or (2) requires a commitment to a particular structure size or type, the draft EIS needs to include an evaluation and discussion of practicable alternatives to the structure or to the significant encroachment. The draft EIS should include exhibits which display the alternatives, the base floodplains and, where applicable, the regulatory floodways.

If the preferred alternative includes a floodplain encroachment having significant impacts, the final EIS must include a finding that it is the only practicable alternative as required by 23 CFR 650, Subpart A. The finding should refer to Executive Order 11988 and 23 CFR 650, Subpart A. It should be included in a separate subsection entitled "Only Practicable Alternative Finding" and must be supported by the following information.

(a) The reasons why the proposed action must be located in the floodplain;

(b) The alternatives considered and why they were not practicable; and

(c) A statement indicating whether the action conforms to applicable State or local floodplain protection standards.

For each alternative encroaching on a designated or proposed regulatory floodway, the draft EIS should provide a preliminary indication of whether the encroachment would be consistent with or require a revision to the regulatory floodway. Engineering and environmental analyses should be undertaken, commensurate with the level of encroachment, to permit the consistency evaluation and identify impacts. Coordination with the Federal Emergency Management Agency (FEMA) and appropriate State and local government agencies should be undertaken for each floodway encroachment. If the preferred alternative encroaches on a regulatory floodway, the final EIS should discuss the consistency of the action with the regulatory floodway. If a floodway revision is necessary, the EIS should include evidence from FEMA and local or State agency indicating that such revision would be acceptable.

15. Wild and Scenic Rivers

If the proposed action could have foreseeable adverse effects on a river on the National Wild and Scenic Rivers System or a river under study for designation to the National Wild and Scenic Rivers System, the draft EIS should identify early coordination undertaken with the agency responsible for managing the listed or study river (i.e., National Park Service (NPS), Fish and Wildlife Service (FWS), Bureau of Land Management (BLM), or Forest Service (FS)). For each alternative under consideration, the EIS should identify the potential adverse

P-047-014

effects on the natural, cultural, and recreational values of the listed or study river. Adverse effects include alteration of the free-flowing nature of the river, alteration of the setting or deterioration of water quality. If it is determined that any of the alternatives could foreclose options to designate a study river under the Act, or adversely affect those qualities of a listed river for which it was designated, to the fullest extent possible, the draft EIS needs to reflect consultation with the managing agency on avoiding or mitigating the impacts (23 CFR 771.123(c)). The final EIS should identify measures that will be included in the preferred alternative to avoid or mitigate such impacts.

Publicly owned waters of designated wild and scenic rivers are protected by Section 4(f). Additionally, public lands adjacent to a Wild and Scenic River may be subject to Section 4(f) protection. An examination of any adopted or proposed management plan for a listed river should be helpful in making the determination on applicability of Section 4(f). For each alternative that takes such land, coordination with the agency responsible for managing the river (either NPS, FWS, BLM, or FS) will provide information on the management plan, specific affected land uses, and any necessary Section 4(f) coordination.

16. Coastal Barriers

The Coastal Barrier Resources Act (CBRA) establishes certain coastal areas to be protected by prohibiting the expenditure of Federal funds for new and expanded facilities within designated coastal barrier units. When a proposed project impacts a coastal barrier unit, the draft EIS should: include a map showing the relationship of each alternative to the unit(s); identify direct and indirect impacts to the unit(s), quantifying and describing the impacts as appropriate; discuss the results of early coordination with FWS, identifying any issues raised and how they were addressed, and; identify any alternative which (if selected) would require an exception under the Act. Any issues identified or exceptions required for the preferred alternative should be resolved prior to its selection. This resolution should be documented in the final EIS.

17. Coastal Zone Impacts

Where the proposed action is within, or is likely to affect land or water uses within the area covered by a State Coastal Zone Management Program (CZMP) approved by the Department of Commerce, the draft EIS should briefly describe the portion of the affected CZMP plan, identify the potential impacts, and include evidence of coordination with the State Coastal Zone Management agency or appropriate local agency. The final EIS should include the State Coastal Zone Management agency's determination on consistency with the State CZMP plan. (In some States, an agency will make a consistency determination only after the final EIS is approved, but will provide a preliminary indication before the final EIS that the project is "not inconsistent" or "appears to be consistent" with the plan.) (Fordirect Federal actions, the final EIS should include the lead agency's consistency determination and agreement by the State CZM agency.) If the preferred alternative is inconsistent with the State's approved CZMP, it can be Federally funded only if the Secretary of Commerce makes a finding that the proposed action is consistent with the purpose or objectives of the CZM Act or is necessary in the interest of national security. To the fullest extent possible, such a finding needs to be included in the final EIS. If the finding is denied, the action is not eligible for Federal funding unless modified in such a manner to remove the inconsistency finding. The final EIS should document such results.

18. Threatened or Endangered Species

The HA must obtain information from the FWS of the DOI and/or the National Marine Fisheries Service (NMFS) of the Department of Commerce to determine the presence or absence of listed and proposed threatened or endangered species and designated and proposed critical habitat in the proposed project area (50 CFR 402.12(c)). The information may be (1) a published geographical list of such species or critical habitat; (2) a project-specific notification of a list of such species or critical habitat; or (3) substantiated information from other credible sources. Where the information is obtained from a published

P-047-014

geographical list the reasons why this would satisfy the coordination with DOI should be explained. If there are no species or critical habitat in the proposed project area, the Endangered Species Act requirements have been met. The results of this coordination should be included in the draft EIS.

When a proposed species or a proposed critical habitat may be present in the proposed project area, an evaluation or, if appropriate, a biological assessment is made on the potential impacts to identify whether any such species or critical habitat are likely to be adversely affected by the project. Informal consultation with FWS and/or NMFS should be undertaken during the evaluation. The draft EIS should include exhibits showing the location of the species or habitat, summarize the evaluation and potential impacts, identify proposed mitigation measures, and evidence coordination with FWS and/or NMFS. If the project is likely to jeopardize the continued existence of any proposed species or result in the destruction oradverse modification of proposed critical habitat, the HA in consultation with the FHWA must confer with FWS and/or NMFS to attempt to resolve potential conflicts by avoiding, minimizing, or reducing the project impacts (50 CFR 402.10(a)). If the preferred alternative is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat, a conference with FWS and/or NMFS must be held to assist in identifying and resolving potential conflicts. To the fullest extent possible, the final EIS needs to summarize the results of the conference and identify reasonable and prudent alternatives to avoid the jeopardy to such proposed species or critical habitat. If no alternatives exist, the final EIS should explain the reasons why and identify any proposed mitigation measures to minimize adverse effects.

When a listed species or a designated critical habitat may be present in the proposed project area, a biological assessment must be prepared to identify any such species or habitat which are likely to be adversely affected by the proposed project (50 CFR 402.12). Informal consultation should be undertaken or, if desirable, a conference held with FWS and/or NMFS during preparation of the biological assessment. The draft EIS should summarize the following data from the biological assessment:

(a) The species distribution, habitat needs, and other biological requirements;

(b) The affected areas of the proposed project;

(c) Possible impacts to the species including opinions of recognized experts on the species at issue;

(d) Measures to avoid or minimize adverse impacts; and

(e) Results of consultation with FWS and/or NMFS.

In selecting an alternative, jeopardy to a listed species or the destruction or adverse modification ofdesignated critical habitat must be avoided (50 CFR 402.01(a)). If the biological assessment indicates that there are no listed species or critical habitat present that are likely to be adversely affected by the preferred alternative, the final EIS should evidence concurrence by the FWS and/or NMFS in such a determination and identify any proposed mitigation for the preferred alternative.

If the results of the biological assessment or consultation with FWS and/or NMFS show that the preferred alternative is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat, to the fullest extent possible, the final EIS needs to contain: (l) a summary of the biological assessment (see data above for draft EIS); (2) a summary of the steps taken, including alternatives or measures evaluated and conferences and consultations held, to resolve the project's conflicts with the listed species or critical habitat; (3) a copy of the biological opinion; (4) a request for an exemption from the Endangered Species Act; (5) the results of the exemption request; and (6) a statement that (if the exemption is denied) the action is not eligible for Federal funding.

19. Historic and Archeological Preservation

P-047-014

The draft EIS should contain a discussion demonstrating that historic and archeological resources have been identified and evaluated in accordance with the requirements of 36 CFR 800.4 for each alternative under consideration. The information and level of effort needed to identify and evaluate historic and archeological resources will vary from project to project as determined by the FHWA after considering existing information, the views of the SHPO and the Secretary of Interior's "Standards and Guidelines for Archeology and Historic Preservation." The information for newly identified historic resources should be sufficient to determine their significance and eligibility for the National Register of Historic Places. The information for archeological resources should be sufficient to identify whether each warrants preservation in place or whether it is important chiefly because of what can be learned by data recovery and has minimal value for preservation in place. Where archeological resources are not a major factor in the selection of a preferred alternative, the determination ofeligibility for the National Register of newly identified archeological resources may be deferred until after circulation of the draft EIS.

The draft EIS discussion should briefly summarize the methodologies used in identifying historic and archeological resources. Because Section 4(f) of the DOT Act applies to the use of historic resources on or eligible for the National Register and to archeological resources on or eligible for the National Register and which warrant preservation in place, the draft EIS should describe the historical resources listed in or eligible for the National Register and identify any archeological resources that warrant preservation in place. The draft EIS should summarize the impacts of each alternative on and proposed mitigation measures for each resource. The document should evidence coordination with the SHPO on the significance of newly identified historic and archeological resources, the eligibility of historic resources for the National Register, and the effects of each alternative on both listed and eligible historic resources. Where the draft EIS discusses eligibility for the National Register of archeological resources, the coordination with the SHPO on eligibility and effect should address both historic and archeological resources.

The draft EIS can serve as a vehicle for affording the Advisory Council on Historic Preservation (ACHP) an opportunity to comment pursuant to Section 106 requirements if the document contains the necessary information required by 36 CFR 800.8. The draft EIS transmittal letter to the ACHP should specifically request its comments pursuant to 36 CFR 800.6.

To the fullest extent possible, the final EIS needs to demonstrate that all the requirements of 36 CFR 800 have been met. If the preferred alternative has no effect on historic or archeological resources on or eligible for the National Register, the final EIS should indicate coordination with and agreement by the SHPO. If the preferred alternative has an effect on a resource on or eligible for the National Register, the final EIS should contain (a) a determination of no adverse effect concurred in by the Advisory Council on Historic Preservation, (b) an executed memorandum of agreement (MOA), or (c) in the case of a rare situation where FHWA is unable to conclude the MOA, a copyof comments transmitted from the ACHP to the FHWA and the FHWA response to those comments.

The proposed use of land from an historic resource on or eligible for the National Register will normally require an evaluation and approval under Section 4(f) of the DOT Act. Section 4(f) also applies to all archeological sites on or eligible for the National Register and which warrant preservation in place. (See Section IX for information on Section 4(f) evaluation.)

20. Hazardous Waste Sites

Hazardous waste sites are regulated by the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). During early planning, the location of permitted and nonregulated hazardous waste sites should be identified. Early coordination with the appropriate Regional Office of the EPA and the appropriate State agency will aid in identifying known or potential hazardous

P-047-014

waste sites. If known or potential waste sites are identified, the locations should be clearly marked on a map showing their relationship to the alternatives under consideration. If a known or potential hazardous waste site is affected by an alternative, information about the site, the potential involvement, impacts and public health concerns of the affected alternative(s), and the proposed mitigation measures to eliminate or minimize impacts or public health concerns should be discussed in the draft EIS.

If the preferred alternative impacts a known or potential hazardous waste site, the final EIS should address and resolve the issues raised by the public and government agencies.

21. Visual Impacts

The draft EIS should state whether the project alternatives have a potential for visual quality impacts. When this potential exists, the draft EIS should identify the impacts to the existing visual resource, the relationship of the impacts to potential viewers of and from the project, as well as measures to avoid, minimize, or reduce the adverse impacts. When there is potential for visual quality impacts, the draft EIS shouldexplain the consideration given to design quality, art, and architecture in the project planning. These values may be particularly important for facilities located in visually sensitive urban or rural settings. When a proposed project will include features associated with design quality, art or architecture, the draft EIS should be circulated to officially designated State and local arts councils and, as appropriate, other organizations with an interest in design, art, and architecture. The final EIS should identify any proposed mitigation for the preferred alternative.

22. Energy

Except for large scale projects, a detailed energy analysis including computations of BTU requirements, etc., is not needed. For most projects, the draft EIS should discuss in general terms the construction and operational energy requirements and conservation potential of various alternatives under consideration. The discussion should be reasonable and supportable. It might recognize that the energy requirements of various construction alternatives are similar and are generally greater than the energy requirements of the no-build alternative. Additionally, the discussion could point out that the post-construction, operational energy requirements of the facility should be less with the build alternative as opposed to the no-build alternative. In such a situation, one might conclude that the savings in operational energy requirements would more than offset construction energy requirements and thus, in the long term, result in a net savings in energy usage.

For large-scale projects with potentially substantial energy impacts, the draft EIS should discuss the major direct and/or indirect energy impacts and conservation potential of each alternative. Direct energy impacts refer to the energy consumed by vehicles using the facility. Indirect impacts include construction energy and such items as the effects of any changes in automobile usage. The alternative's relationship and consistency with a State and/or regional energy plan, if one exists, should also be indicated.

The final EIS should identify any energy conservation measures that will be implemented as a part of the preferred alternative. Measures to conserve energy include theuse of high-occupancy vehicle incentives and measures to improve traffic flow.

23. Construction Impacts

The draft EIS should discuss the potential adverse impacts (particularly air, noise, water, traffic congestion, detours, safety, visual, etc.) associated with construction of each alternative and identify appropriate mitigation measures. Also, where the impacts of obtaining borrow or disposal of waste material are important issues, they should be discussed in the draft EIS along with any proposed measures to minimize these impacts. The final EIS should identify any proposed mitigation for the preferred alternative.

24. The Relationship Between Local Short-term Uses of Man's Environment and the

P-047-014

Maintenance and Enhancement of Long-term Productivity

The EIS should discuss in general terms the proposed action's relationship of local short-term impacts and use of resources, and the maintenance and enhancement of long-term productivity. This general discussion might recognize that the build alternatives would have similar impacts. The discussion should point out that transportation improvements are based on State and/or local comprehensive planning which consider(s) the need for present and future traffic requirements within the context of present and future land use development. In such a situation, one might then conclude that the local short-term impacts and use of resources by the proposed action is consistent with the maintenance and enhancement of long-term productivity for the local area, State, etc.

25. Any Irreversible and Irretrievable Commitments of Resources Which Would be Involved in the Proposed Action

The EIS should discuss in general terms the proposed action's irreversible and irretrievable commitment of resources. This general discussion might recognize that the build alternatives would require a similar commitment of natural, physical, human, and fiscal resources. An example of such discussion would be as follows:

"Implementation of the proposed action involves a commitment of a range of natural, physical, human, and fiscal resources. Land used in the construction of the proposed facility is considered an irreversible commitment during the time period that the land is used for a highway facility. However, if a greater need arises for use of the land or if the highway facility is no longer needed, the land can be converted to another use. At present, there is no reason to believe such a conversion will ever be necessary or desirable.

Considerable amounts of fossil fuels, labor, and highway construction materials such as cement, aggregate, and bituminous material are expended. Additionally, large amounts of labor and natural resources are used in the fabrication and preparation of construction materials. These materials are generally not retrievable. However, they are not in short supply and their use will not have an adverse effect upon continued availability of these resources. Any construction will also require a substantial one-time expenditure of both State and Federal funds which are not retrievable.

The commitment of these resources is based on the concept that residents in the immediate area, State, and region will benefit by the improved quality of the transportation system. These benefits will consist of improved accessibility and safety, savings in time, and greater availability of quality services which are anticipated to outweigh the commitment of these resources."

H. List of Preparers

This section should include lists of:

1. State (and local agency) personnel, including consultants, who were primarily responsible for preparing the EIS or performing environmental studies, and a brief summary of their qualifications, including educational background and experience.
2. The FHWA personnel primarily responsible for preparation or review of the EIS and their qualifications.
3. The areas of EIS responsibility for each preparer.

I. List of Agencies, Organizations, and Persons to Whom Copies of the Statement are Sent

Draft EIS: List all entities from which commentsare being requested (40 CFR 1502.10). Final EIS: Identify those entities that submitted comments on the draft EIS and those receiving a copy of the final EIS (23 CFR 771.125(a) and (g)).

P-047-014

J. Comments and Coordination

1. The draft EIS should contain copies of pertinent correspondence with each cooperating agency, other agencies and the public and summarize: 1) the early coordination process, including scoping; 2) the meetings with community groups (including minority and non-minority interests) and individuals; and 3) the key issues and pertinent information received from the public and government agencies through these efforts.

2. The final EIS should include a copy of substantive comments from the U.S. Secretary of Transportation (OST), each cooperating agency, and other commentors on the draft EIS. Where the response is exceptionally voluminous the comments may be summarized. An appropriate response should be provided to each substantive comment. When the EIS text is revised as a result of the comments received, a copy of the comments should contain marginal references indicating where revisions were made, or the response to the comments should contain such references. The response should adequately address the issue or concern raised by the commentor or, where substantive comments do not warrant further response, explain why they do not, and provide sufficient information to support that position.

   The FHWA and the HA are not commentors within the meaning of NEPA and their comments on the draft EIS should not be included in the final EIS. However, the document should include adequate information for FHWA and the HA to ascertain the disposition of the comment(s).

3. The final EIS should (1) summarize the substantive comments on social, economic, environmental, and engineering issues made at the public hearing, if one is held, or the public involvement activities or which were otherwise considered and (2) discuss the consideration given to any substantive issue raised and provide sufficient information to support that position.

4. The final EIS should document compliance with requirements of all applicable environmental laws, Executive Orders, and other related requirements, such as Title VI of the Civil Rights Act of 1964. To the extent possible, all environmental issues should be resolved prior to the submission of the final EIS. When disagreement on project issues exists with another agency, coordination with the agency should be undertaken to resolve the issues. Where the issues cannot be resolved, the final EIS should identify any remaining unresolved issues, the steps taken to resolve the issues, and the positions of the respective parties. Where issues are resolved through this effort, the final EIS should demonstrate resolution of the concerns.

K. Index

The index should include important subjects and areas of major impacts so that a reviewer need not read the entire EIS to obtain information on a specific subject or impact.

L. Appendices

The EIS should briefly explain or summarize methodologies and results of technical analyses and research. Lengthy technical discussions should be contained in a technical report. Material prepared as appendices to the EIS should:

1. consist of material prepared specifically for the EIS;

2. consist of material which substantiates an analysis fundamental to the EIS;

3. be analytic and relevant to the decision to be made; and

4. be circulated with the EIS within FHWA, to EPA (Region), and to cooperating agencies and be readily available on request by other parties. Other reports and studies referred to in the EIS should be readily available for review or for copying at a convenient location.

CLXXXVIIIONS FOR PREPARING FINAL EISs

P-047-014 The CEQ regulations place heavy emphasis on reducing paperwork, avoiding unnecessary work, and producing documents which are useful to decisionmakers and to the public. With these objectives in mind, three different approaches to preparing final EISs are presented below. The first two approaches can be employed on any project. The third approach is restricted to the conditions specified by CEQ (40 CFR 1503.4(c)).

A. Traditional Approach

Under this approach, the final EIS incorporates the draft EIS (essentially in its entirety) with changes made as appropriate throughout the document to reflect the selection of an alternative, modifications to the project, updated information on the affected environment, changes in the assessment of impacts, the selection of mitigation measures, wetland and floodplain findings, the results of coordination, comments received on the draft EIS and responses to these comments, etc. Since so much information is carried over from the draft to the final, important changes are sometimes difficult for the readerto identify. Nevertheless, this is the approach most familiar to participants in the NEPA process.

B. Condensed Final EIS

This approach avoids repetition of material from the draft EIS by incorporating, by reference, the draft EIS. The final EIS is, thus, a much shorter document than under the traditional approach; however, it should afford the reader a complete overview of the project and its impacts on the human environment.

The crux of this approach is to briefly reference and summarize information from the draft EIS which has not changed and to focus the final EIS discussion on changes in the project, its setting, impacts, technical analysis, and mitigation that have occurred since the draft EIS was circulated. In addition, the condensed final EIS must identify the preferred alternative, explain the basis for its selection, describe coordination efforts, and include agency and public comments, responses to these comments, and any required findings or determinations (40 CFR 1502.14(e) and 23 CFR 771.125(a)).

The format of the final EIS should parallel the draft EIS. Each major section of the final EIS should briefly summarize the important information contained in the corresponding section of the draft, reference the section of the draft that provides more detailed information, and discuss any noteworthy changes that have occurred since the draft was circulated.

At the time that the final is circulated, an additional copy of the draft EIS need not be provided to those parties that received a copy of the draft EIS when it was circulated. Nevertheless, if, due to the passage of time or other reasons, it is likely that they will have disposed of their original copy of the draft EIS, then a copy of the draft EIS should be provided with the final. In any case, sufficient copies of the draft EIS should be on hand to satisfy requests for additional copies. Both the draft EIS and the condensed final EIS should be filed with EPA under a single final EIS cover sheet.

C. Abbreviated Version of Final EIS

The CEQ regulation (40 CFR 1503.4(c)) provides the opportunity to expedite the final EIS preparation where the only changes needed in the document are minor and consist of factual corrections and/or an explanation of why the comments received on the draft EIS do not warrant further response. In using this approach, care should be exercised to assure that the draft EIS contains sufficient information to make the findings in (2) below and that the number of errata sheets used to make required changes is small and that these errata sheets together with the draft EIS constitute a readable, understandable, full disclosure document. The final EIS should consist of the draft EIS and an attachment containing the following:

1. Errata sheets making any necessary corrections to the draft EIS;

2. A section identifying the preferred alternative and a discussion of the reasons it was selected. The following should also be included in this section where applicable:

P-047-014

(a) final Section 4(f) evaluations containing the information described in Section IX of these guidelines;

(b) wetland and finding(s);

(c) floodplain finding(s);

(d) a list of commitments for mitigation measures for the preferred alternative; and

3. Copies (or summaries) of comments received from circulation of the draft EIS and public hearing and responses thereto.

   Only the attachment need be provided to parties who received a copy of the draft EIS, unless it is likely that they will have disposed of their original copy, in which case both the draft EIS and the attachment should be provided (40 CFR 1503.4(c)). Both the draft EIS and the attachment must be filed with EPA under a single final EIS cover sheet(40 CFR 1503.4(c)).

CXCDISTRIBUTION OF EISs AND SECTION 4(f) EVALUATIONS

A. Environmental Impact Statement

1. After clearance by FHWA, copies of all draft EISs must be made available to the public and circulated for comments by the HA to: all public officials, private interest groups, and members of the public known to have an interest in the proposed action or the draft EIS; all Federal, State, and local government agencies expected to have jurisdiction, responsibility, interest, or expertise in the proposed action; and States and Federal land management entities which may be affected by the proposed action or any of the alternatives (40 CFR 1502.19 and 1503.1). Distribution must be made no later than the time the document is filed with EPA for Federal Register publication and must allow for a minimum 45-day review period (40 CFR 1506.9 and 1506.10). Internal FHWA distribution of draft and final EISs is subject to change and is noted in memorandums to the Regional Administrators as requirements change.

2. Copies of all approved final EISs must be distributed to all Federal, State, and local agencies and private organizations, and members of the public who provided substantive comments on the draft EIS or who requested a copy (40 CFR 1502.19). Distribution must be made no later than the time the document is filed with EPA for Federal Register publication and must allow for a minimum 30-day review period before the Record of Decision is approved (40 CFR 1506.9 and 1506.10). Two copies of all approved EISs should be forwarded to the FHWA Washington Headquarters (HEV-11) for recordkeeping purposes.

3. Copies of all EISs should normally be distributed to EPA and DOI as follows, unlessthe agency has indicated to the FHWA offices the need for a different number of copies:

   (a) The EPA Headquarters: five copies of the draft EIS and five copies of the final EIS (This is the "filing requirement" in Section 1506.9 of the CEQ regulation.) to the following address:

   Environmental Protection Agency
   Office of Federal Activities
   (A-104), 401 M Street, SW
   Washington, D.C. 20460

   (b) The appropriate EPA Regional Office responsible for EPA's review pursuant to Section 309 of the Clean Air Act: five copies of the draft EIS and five copies of the final EIS.

   (c) The DOI Headquarters to the following address:

P-047-014

U.S. Department of the Interior
Office of Environmental Project Review
Room 4239
18th and C Streets, NW
Washington, DC 20240

(i) All States in FHWA Regions 1, 3, 4, and 5, plus Hawaii, Guam, American Samoa, Virgin Islands, Arkansas, Iowa, Louisiana, and Missouri: 12 copies of the draft EIS and 7 copies of the final EIS.

(ii) Kansas, Nebraska, North Dakota, Oklahoma, South Dakota, and Texas: 13 copies of the draft EIS and 8 copies of the final EIS.

(iii) New Mexico and all States in FHWA Regions 8, 9, and 10,except Hawaii, North Dakota, and South Dakota: 14 copies of the draft EIS and 9 copies of the final EIS.

Note: DOI Headquarters will make distribution within its Department. While not required, advance distribution to DOI field offices may be helpful to expedite their review.

B. Section 4(f) Evaluation

If the Section 4(f) evaluation is included in a draft EIS, the DOI Headquarters does not need additional copies of the draft or final EIS/Section 4(f) evaluation. If the Section 4(f) evaluation is processed separately or as part of an EA, the DOI should receive seven copies of the draft Section 4(f) evaluation for coordination and seven copies of the final Section 4(f) evaluation for information. In addition to coordination with DOI, draft Section 4(f) evaluations must be coordinated with the officials having jurisdiction over the Section 4(f) property and the Department of Housing and Urban Development (HUD) and the United States Department of Agriculture (USDA) where these agencies have an interest in or jurisdiction over the affected Section 4(f) resource (23 CFR 771.135(i)). The point of coordination for HUD is the appropriate Regional Office and for USDA, the Forest Supervisor of the affected National Forest. One copy should be provided to the officials with jurisdiction and two copies should be submitted to HUD and USDA when coordination is required.

CXCVRECORD OF DECISION--FORMAT AND CONTENT

The Record of Decision (ROD) will explain the reasons for the project decision, summarize any mitigation measures that will be incorporated in the project, and document any required Section 4(f) approval. While cross-referencing and incorporation by reference of the final EIS (or final EIS supplement) and other documents are appropriate, the ROD must explain the basis for the project decision as completely as possible, based on the information contained in the EIS (40 CFR 1502.2). A draft ROD should be prepared by the HA and submitted to the Division Officewith the final EIS. The following key items need to be addressed in the ROD:

A. Decision.

Identify the selected alternative. Reference to the final EIS (or final EIS supplement) may be used to reduce detail and repetition.

B. Alternatives Considered.

This information can be most clearly organized by briefly describing each alternative and explaining the balancing of values which formed the basis for the decision. This discussion must identify the environmentally preferred alternative(s) (i.e., the alternative(s) that causes the least damage to the biological and physical environment) (40 CFR 1505.2(b)). Where the selected alternative is other than the environmentally preferable alternative, the ROD should clearly state the reasons for not selecting the environmentally preferred alternative. If lands protected by Section 4(f) were a factor in the selection of the preferred alternative, the ROD should explain how the Section 4(f) lands

P-047-014

influenced the selection.

The values (social, economic, environmental, cost-effectiveness, safety, traffic, service, community planning, etc.) which were important factors in the decisionmaking process should be clearly identified along with the reasons some values were considered more important than others. The Federal-aid highway program mandate to provide safe and efficient transportation in the context of all other Federal requirements and the beneficial impacts of the proposed transportation improvements should be included in this balancing. While any decision represents a balancing of the values, the ROD should reflect the manner in which these values were considered in arriving at the decision.

C. Section 4(f).

Summarize the basis for any Section 4(f) approval when applicable (23 CFR 771.127(a)). The discussion should include the key information supporting such approval. Where appropriate,this information may be included in the alternatives discussion above and referenced in this paragraph to reduce repetition.

D. Measures to Minimize Harm.

Describe the specific measures adopted to minimize environmental harm and identify those standard measures (e.g., erosion control, appropriate for the proposed action). State whether all practicable measures to minimize environmental harm have been incorporated into the decision and, if not, why they were not (40 CFR 1505.2(c)).

E. Monitoring or Enforcement Program.

Describe any monitoring or enforcement program which has been adopted for specific mitigation measures, as outlined in the final EIS.

F. Comments on Final EIS.

All substantive comments received on the final EIS should be identified and given appropriate responses. Other comments should be summarized and responses provided where appropriate.

For recordkeeping purposes, a copy of the signed ROD should be provided to the Washington Headquarters (HEV-11). For a ROD approved by the Division Office, copies should be sent to both the Washington Headquarters and the Regional Office.

CCI SECTION 4(f) EVALUATIONS--FORMAT AND CONTENT

A Section 4(f) evaluation must be prepared for each location within a proposed project before the use of Section 4(f) land is approved (23 CFR 771.135(a)). For projects processed with an EIS or an EA/FONSI, the individual Section 4(f) evaluation should be included as a separate section of the document, and for projects processed as categorical exclusions, as a separate Section 4(f) evaluation document. Pertinent information from various sections of the EIS or EA/FONSI may be summarized in the Section 4(f) evaluation to reduce repetition. Where an issue on constructive use Section 4(f) arises and FHWA decides that Section 4(f) does not apply, the environmental document should contain sufficientanalysis and information to demonstrate that the resource(s) is not substantially impaired.

The use of Section 4(f) land may involve concurrent requirements of other Federal agencies. Examples include consistency determinations for the use of public lands managed by the Bureau of Land Management, compatibility determinations for the use of land in the National Wildlife Refuge System and the National Park System, determinations of direct and adverse effects for Wild and Scenic Rivers, and approval of land conversions under Section 6(f) of the Land and Water Conservation Fund Act. The mitigation plan developed for the project should include measures which would satisfy the various requirements. For example, Section 6(f) directs the Department of the Interior (National Park Service) to assure that replacement lands of equal value, location, and usefulness are provided as conditions to approval of land conversions. Therefore, where a Section 6(f) land conversion is proposed for a highway project, replacement land will be necessary. Regardless of the mitigation proposed, the draft and final

P-047-014 Section 4(f) evaluations should discuss the results of coordination with the public official having jurisdiction over the Section 4(f) land and document the National Park Service's position on the Section 6(f) land transfer, respectively.

A. Draft Section 4(f) Evaluation

The following format and content are suggested. The listed information should be included in the Section 4(f) evaluation, as applicable.

1. Proposed Action.

   Where a separate Section 4(f) evaluation is prepared, describe the proposed project and explain the purpose and need for the project.

2. Section 4(f) Property.

   Describe each Section 4(f) resource which would be used by any alternative under consideration. The following information should be provided:

   (a) A detailed map or drawing of sufficient scale to identify the relationship of the alternatives to the Section 4(f) property.

   (b) Size (acres or square feet) and location (maps or other exhibits such as photographs, sketches, etc.) of the affected Section 4(f) property.

   (c) Ownership (city, county, State, etc.) and type of Section 4(f) property (park, recreation, historic, etc.).

   (d) Function of or available activities on the property (ball playing, swimming, golfing, etc.).

   (e) Description and location of all existing and planned facilities (ball diamonds, tennis courts, etc.).

   (f) Access (pedestrian, vehicular) and usage (approximate number of users/visitors, etc.).

   (g) Relationship to other similarly used lands in the vicinity.

   (h) Applicable clauses affecting the ownership, such as lease, easement, covenants, restrictions, or conditions, including forfeiture.

   (i) Unusual characteristics of the Section 4(f) property (flooding problems, terrain conditions, or other features) that either reduce or enhance the value of all or part of the property.

3. Impacts on the Section 4(f) Property(ies).

   Discuss the impacts on the Section 4(f) property for each alternative (e.g., amount of land to be used, facilities andfunctions affected, noise, air pollution, visual, etc.). Where an alternative (or alternatives) uses land from more than one Section 4(f) property, a summary table would be useful in comparing the various impacts of the alternative(s). Impacts (such as facilities and functions affected, noise, etc.) which can be quantified should be quantified. Other impacts (such as visual intrusion) which cannot be quantified should be described.

4. Avoidance Alternatives.

   Identify and evaluate location and design alternatives which would avoid the Section 4(f) property. Generally, this would include alternatives to either side of the property. Where an alternative would use land from more than one Section 4(f) property, the analysis needs to

P-047-014

evaluate alternatives which avoid each and all properties (23 CFR 771.135(i)). The design alternatives should be in the immediate area of the property and consider minor alignment shifts, a reduced facility, retaining structures, etc. individually or in combination, as appropriate. Detailed discussions of alternatives in an EIS or EA need not be repeated in the Section 4(f) portion of the document, but should be referenced and summarized. However, when alternatives (avoiding Section 4(f) resources) have been eliminated from detailed study the discussion should also explain whether these alternatives are feasible and prudent and, if not, the reasons why.

5. Measures to Minimize Harm.

   Discuss all possible measures which are available to minimize the impacts of the proposed action on the Section 4(f) property(ies). Detailed discussions of mitigation measures in the EIS or EA may be referenced and appropriately summarized, rather than repeated.

6. Coordination.

   Discuss the results of preliminary coordination with the public official having jurisdiction over the Section 4(f) property and with regional (or local) offices of DOI and, as appropriate, the Regional Office of HUD and the Forest Supervisor of the affected National Forest. Generally, the coordination should include discussion of avoidance alternatives, impacts tothe property, and measures to minimize harm. In addition, the coordination with the public official having jurisdiction should include, where necessary, a discussion of significance and primary use of the property.

   Note:The conclusion that there are no feasible and prudent alternatives is not normally addressed at the draft Section 4(f) evaluation stage. Such conclusion is made only after the draft Section 4(f) evaluation has been circulated and coordinated and any identified issues adequately evaluated.

B. Final Section 4(f) Evaluation

When the preferred alternative uses Section 4(f) land, the final Section 4(f) evaluation must contain (23 CFR 771.135(i) and (j)):

1. All the above information for a draft evaluation.

2. A discussion of the basis for concluding that there are no feasible and prudent alternatives to the use of the Section 4(f) land. The supporting information must demonstrate that "there are unique problems or unusual factors involved in the use of alternatives that avoid these properties or that the cost, social, economic, and environmental impacts, or community disruption resulting from such alternatives reach extraordinary magnitudes" (23 CFR 771.135(a)(2)). This language should appear in the document together with the supporting information.

3. A discussion of the basis for concluding that the proposed action includes all possible planning to minimize harm to the Section 4(f) property. When there are no feasible and prudent alternatives which avoid the use of Section 4(f) land, the final Section 4(f) evaluation must demonstrate that the preferredalternative is a feasible and prudent alternative with the least harm on the Section 4(f) resources after considering mitigation to the Section 4(f) resources.

4. A summary of the appropriate formal coordination with the Headquarters Offices of DOI (and/or appropriate agency under that Department) and, as appropriate, the involved offices of USDA and HUD.

5. Copies of all formal coordination comments and a summary of other relevant Section 4(f) comments received an analysis and response to any questions raised. Where new alternatives or modifications to existing alternatives are identified and will not be given

P-047-014

further consideration, the basis for dismissing these alternatives should be provided and supported by factual information. Where Section 6(f) land is involved, the National Park Service's position on the land transfer should be documented.

6. Concluding statement as follows: "Based upon the above considerations, there is no feasible and prudent alternative to the use of land from the (identify Section 4(f) property) and the proposed action includes all possible planning to minimize harm to the (Section 4(f) property) resulting from such use."

CCXOTHER AGENCY STATEMENTS

A. The FHWA review of statements prepared by other agencies will consider the environmental impact of the proposal on areas within FHWA's functional area of responsibility or special expertise (40 CFR 1503.2).

B. Agencies requesting comments on highway impacts usually forward the draft EIS to the FHWA Washington Headquarters for comment. The FHWA Washington Headquarters will normally distribute these EISs to the appropriate Regional or Division Office (per Regional Office request) and will indicate where the comments should be sent. The Regional Office may elect to forward the draft statement to the Division Office for response.

C. When a field office has received a draft EIS directly from another agency, it may comment directly to that agency if the proposal does not fall within the types indicated in item (d) of this section. If more than one DOT Administration is commenting at the Regional level, the comments should be coordinated by the DOT Regional Representative to the Secretary or designee. Copies of the FHWA comments should be distributed as follows:

1. Requesting agency--original and one copy.
2. P-14--one copy.
3. DOT Secretarial Representative--one copy.
4. HEV-11--one copy.

D. The following types of actions contained in the draft EIS require FHWA Washington Headquarters review and such EISs should be forwarded to the Director, Office of Environmental Policy, along with Regional comments, for processing:

1. actions with national implications, and
2. legislation or regulations having national impacts or national program proposals.

CCXREEVALUATIONS

A. Draft EIS Reevaluation

If an acceptable final EIS is not received by FHWA within 3 years from the date of the draft EIS circulation, then a written evaluation is required to determine whether there havebeen changes in the project or its surroundings or new information which would require a supplement to the draft EIS or a new draft EIS (23 CFR 771.129(a)). The written evaluation should be prepared by the HA in consultation with FHWA and should address all current environmental requirements. The entire project should be revisited to assess any changes that have occurred and their effect on the adequacy of the draft EIS.

There is no required format for the written evaluation. It should focus on the changes in the project, its surroundings and impacts, and any new issues identified since the draft EIS. Field reviews, additional studies (as necessary), and coordination (as appropriate) with other agencies should be undertaken and the results included in the written evaluation. If, after reviewing the written evaluation, the FHWA concludes that a supplemental EIS or a new draft EIS is not required, the

P-047-014

decision should be appropriately documented. Since the next major step in the project development process is preparation of a final EIS, the final EIS may document the decision. A statement to this fact, the conclusions reached, and supporting information should be briefly summarized in the Summary Section of the final EIS.

B. Final EIS Reevaluation

There are two types of reevaluations required for a final EIS: consultation and written evaluation (23 CFR 771.129(b) and (c)). For the first, consultation, the final EIS is reevaluated prior to proceeding with major project approval (e.g., right-of-way acquisition, final design, and plans, specifications, and estimates (PS&E)) to determine whether the final EIS is still valid. The level of analysis and documentation, if any, should be agreed upon by the FHWA and HA. The analysis and documentation should focus on and be commensurate with the changes in the project and its surroundings, potential for controversy, and length of time since the last environmental action. For example, when the consultation occurs shortly after final EIS approval, an analysis usually should not be necessary. However, when it occurs nearly 3 years after final EIS approval, but before a written evaluation is required, the level of analysis should be similar to what normally would be undertaken for a written evaluation. Although written documentation is left to the discretion of the DivisionAdministrator, it is suggested that each consultation be appropriately documented in order to have a record to show the requirement was met.

The second type of reevaluation is a written evaluation. It is required if the HA has not taken additional major steps to advance the project (i.e., has not received from FHWA authority to undertake final design, authority to acquire a significant portion of the right-of-way, or approval of the PS&E) within any 3-year time period after approval of the final EIS, the final supplemental EIS, or the last major FHWA approval action.

The written evaluation should be prepared by the HA in consultation with FHWA and should address all current environmental requirements. The entire project should be revisited to assess any changes that have occurred and their effect on the adequacy of the final EIS.

There is no required format for the written evaluation. It should focus on the changes in the project, its surroundings and impacts, and any new issues identified since the final EIS was approved. Field reviews, additional environmental studies (as necessary), and coordination with other agencies should be undertaken (as appropriate to address any new impacts or issues) and the results included in the written evaluation. The FHWA Division Office is the action office for the written evaluation. If it is determined that a supplemental EIS is not needed, the project files should be documented appropriately. In those rare cases where an EA is prepared to serve as the written evaluation, the files should clearly document whether new significant impacts were identified during the reevaluation process.

CCXS SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENTS (EISs)

Whenever there are changes, new information, or further developments on a project which result in significant environmental impacts not identified in the most recently distributed version of the draft or final EIS, a supplemental EIS is necessary (40 CFR 1502.9(c)). If it is determined that the changes or new information do not result in new or different significant environmental impacts, the FHWA Division Administrator should document the determination. (After final EIS approval, this documentation could take the form of notationto the files; for a draft EIS, this documentation could be a discussion in the final EIS.)

A. Format and Content of a Supplemental EIS

There is no required format for a supplemental EIS. The supplemental EIS should provide sufficient information to briefly describe the proposed action, the reason(s) why a supplement is being prepared, and the status of the previous draft or final EIS. The supplemental EIS needs to address only those changes or new information that are the basis for preparing the supplement and were not addressed in the previous EIS (23 CFR 771.130(a)). Reference to and summarizing the previous EIS is preferable to repeating unchanged, but still valid, portions of the original document. For example, some items such as affected environment, alternatives, or impacts which are

P-047-014

unchanged may be briefly summarized and referenced. New environmental requirements which became effective after the previous EIS was prepared need to be addressed in the supplemental EIS to the extent they apply to the portion of the project being evaluated and are relevant to the subject of the supplement (23 CFR 771.130(a)). Additionally, to provide an up-to-date status of compliance with NEPA, it is recommended that the supplement summarize the results of any reevaluations that have been performed for portions of or the entire proposed action. By this inclusion, the supplement will reflect an up-to-date consideration of the proposed action and its effects on the human environment. When a previous EIS is referenced, the supplemental EIS transmittal letter should indicate that copies of the original (draft or final) EIS are available and will be provided to all requesting parties.

B. Distribution of a Supplemental EIS

A supplemental EIS will be reviewed and distributed in the same manner as a draft and final EIS (23 CFR 771.130(d)). (See Section VII for additional information.)

XII. Appendices

Two appendices are included as follows:

Appendix A:Environmental Laws, Authority, and Related Statutes and Orders

Appendix B:Preparation and Processing of Notices of Intent.

ENVIRONMENTAL LAWS, AUTHORITY, AND RELATED STATUTES AND ORDERS

AUTHORITY:

42 United States Code (U.S.C.) 4321 et seq., National Environmental Policy Act of 1969, as amended.

23 U.S.C. 138 and 49 U.S.C. 303, Section 4(f) of the Department of Transportation (DOT) Act of 1966.

23 U.S.C. 109(h), (i), and (j) standards.

23 U.S.C. 128, Public Hearings.

23 U.S.C. 315, Rules, Regulations, and Recommendations.

23 Code of Federal Regulations (CFR), Part 771, Environmental Impact and Related Procedures.

40 CFR 1500 et seq., Council on Environmental Quality, Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act.

49 CFR 1.48(b), DOT Delegations of Authority to the Federal Highway Administration.

DOT Order 5610.1c, Procedures for Considering Environmental Impacts, September 18, 1979, and subsequent revisions.

RELATED STATUTES AND ORDERS: The following is a list of major statutes and orders on the preparation of environmental documents.

7 U.S.C. 4201 et seq., Farmland Protection Policy Act of 1981.

16 U.S.C. 461 et seq., Archaeological and Historic Preservation Act; and 23 U.S.C. 305.

16 U.S.C. 470f, Sections 106, 110(d), and 110(f) of the National Historic Preservation Act of 1966.

16 U.S.C. 662, Section 2 of the Fish and Wildlife Coordination Act.

P-047-014

16 U.S.C. 1452, 1456, Sections 303 and 307 of the Coastal Zone Management Act of 1972.

16 U.S.C. 1271 et. seq., Wild and Scenic Rivers Act.

16 U.S.C. 1536, Section 7 of the Endangered Species Act of 1973.

33 U.S.C. 1251 et seq., Clean Water Act of 1977.

33 U.S.C 1241 et seq., Resource Conservation and Recovery Act.

42 U.S.C. 300(f) et seq., Safe Drinking Water Act.

42 U.S.C. 4371 et seq., Environmental Quality Improvement Act of 1970.

42 U.S.C. 4601 et seq., Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

42 U.S.C. 4901 et seq., Noise Control Act of 1972.

42 U.S.C. 9601 et seq., Comprehensive Environmental Response, Compensation, and Liability Act of 1980.

42 U.S.C. 7401 et seq., Clean Air Act.

42 U.S.C. 2000d-d4, Title VI of the Civil Rights Act of 1964.

43 U.S.C. Coastal Barriers Resources Act of 1982.

Executive Order 11514, Protection and Enhancement of Environmental Quality, as amended by Executive Order 11991, dated May 24, 1977.

Executive Order 11593, Protection and Enhancement of the Cultural Environment, dated May 13, 1971, implemented by DOT Order 5650.1, dated, November 20, 1972.

Executive Order 11988, Floodplain Management, dated May 24, 1977, implemented by DOT Order 5650.2, dated April 23, 1979.

Executive Order 11990, Protection of Wetlands, dated May 24, 1977, implemented by DOT Order 5660.1A, dated August 24, 1978.

Preparation and Processing of Notices of Intent

The CEQ regulations and Title 23, Code of Federal Regulations, Part 771, Environmental Impact and Related Procedures, require the Administration to publish a notice of intent in the Federal Register as soon as practicable after the decision is made to prepare an environmental impact statement (EIS) and before the scoping process (40 CFR 1501.7). A notice of intent will also be published when a decision is made to supplement a final EIS, but will not be necessary when preparing a supplement to a draft EIS (23 CFR 771.130(d)). The responsibility for preparing notices of intent has been delegated to Regional Federal Highway Administrators and subsequently redelegated to Division Administrators. The notice should be sent directly to the Federal Register at the address provided in Attachment 1 and a copy provided to the Project Development Branch (HEV-11), Office of Environmental Policy, and the appropriate Region Office.

In cases where a notice of intent is published in the Federal Register and a decision is made not to prepare the draft EIS or, when the draft EIS has been prepared, a decision is made not to prepare a final EIS, a revised notice of intent should be published in the Federal Register advising of the decision and the reasons for not preparing the EIS. This applies to future and current actions being processed.

Notices of intent should be prepared and processed in strict conformance with the guidelines in Attachment 1 in order to ensure acceptance for publication by the Office of the Federal Register. A sample of each notice of intent for preparation of an EIS and a supplemental EIS is provided as Attachment 2.

P-047-014 The Project Development Branch (HEV-11) will serve as the Federal Register contact point for notice of intent. All inquiries should be directed to that office.

GUIDELINES FOR PREPARATION AND PROCESSING OF NOTICES OF INTENT

FORMAT

1. Typed in black on white bond paper.
2. Paper size: 8 1/2" x 11".
3. Margins: Left at least 1 1/2", all others 1".
4. Spacing: All material double spaced (except title in heading).
5. Heading: Four items on first page at head of document (see Attachment 2):
   - Billing Code No. 4910-22 typed in brackets or parentheses
   - DEPARTMENT OF TRANSPORTATION (all upper case)
   - Federal Highway Administration
   - ENVIRONMENTAL IMPACT STATEMENT; COUNTY OR CITY, STATE (all upper case; single space)
6. Text: Five sections - AGENCY, ACTION, SUMMARY, FOR FURTHER INFORMATION CONTACT, AND SUPPLEMENTARY INFORMATION; each section title in upper case followed by colon (see Content (below) and Samples 1 and 2).
7. Closing:
   - Include the Catalog of Federal Domestic Assistance number and title
   - Issued on:

     (indent 5 spaces and type or stamp in date when document is signed)
   - Signature line

     (begin in middle of page; type name, title, and city under the signature; use name and title of the officialactually signing the document (e.g., "John Doe, District Engineer," not "John Doe, for the Division Administrator"))
8. Document should be neat and in form suitable for public inspection. Two or more notices of intent can be included in a single document by making appropriate revisions to the heading and text of the document.

CONTENT

1. AGENCY: Federal Highway Administration (FHWA), DOT.
2. ACTION: Notice of Intent.
3. SUMMARY: The FHWA is issuing this notice to advise the public that an environmental impact statement will be prepared for a proposed highway project in . . . .
4. FOR FURTHER INFORMATION CONTACT: This section should state the name and address of a person or persons within the FHWA Division Office who can answer questions about the proposed action and the EIS as it is being developed. The listing of a telephone number is optional. State and/or local officials may also be listed, but always following the FHWA contact person.

P-047-014

8. SUPPLEMENTARY INFORMATION: This section should contain:

   a. a brief narrative description of the proposed action (e.g., location of the action, type of construction, length of the project, needs which will be fulfilled by the action);

      For a supplement to a final EIS add: the original EIS number and approval date, and the reason(s) for preparing the supplement;

   b. a brief description of possible alternatives to accomplish the goals of the proposed action (e.g., upgrade existing facility, do nothing (should always be listed), construction on new alignment, mass transit, multi-modal design); and

   c. a brief description of the proposed scoping process for the particular action including whether, when, and where any scoping meeting will be held.

      For a supplement to a final EIS: the scoping process is not required for a supplement; however, scoping should be discussed to the extent anticipated for the development of the supplement;

      In drafting this section -

      - use plain English
      - avoid technical terms and jargon
      - always refer to the proposed action or proposed project (e.g., the proposed action would . . .)
      - identify all abbreviations
      - list FHWA first when other agencies (State or local) are listed as being involved in the preparation of the EIS

PROCESSING

1. Send three (3) duplicate originals each signed in ink by the issuing officer to:

   Office of the Federal Register
   National Archives and Records Administration
   Washington, DC 20408

2. The duplicates must be identical in all respects. The Federal Register will accept electrostatic copies as long as they are readable and individually signed.

3. Three (3) additional copies are required if material is printed on both sides. If a single original and two certified copies are sent, the statement "CERTIFIED TO BE A TRUE COPY OF THE ORIGINAL" and the signature of a duly authorized certifying officer must appear on each certified copy.

4. A record should be kept of the date on which each notice is mailed to the Federal Register.

5. Send one (1) copy each to the Project Development Branch (HEV-11) and the Regional office.

S A M P L E 1

[4910-22]

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

ENVIRONMENTAL IMPACT STATEMENT: WASHINGTON COUNTY, WASHINGTON

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Notice of Intent.

P-047-014 SUMMARY: The FHWA is issuing this notice to advise the public that an environmental impact statement will be prepared for a proposed highway project in Washington County, Washington.

FOR FURTHER INFORMATION CONTACT: James West, District Engineer, Federal Highway Administration, 400 Market Street, State Capital, Washington 98507, Telephone: (206) 222-2222.

SUPPLEMENTARY INFORMATION: The FHWA, in cooperation with the Washington Department of Transportation and the Washington County Highway Department, will prepare an environmental impact statement (EIS) on a proposal to improve U.S. Route 10 (U.S. 10) in Washington County, Washington. The proposed improvement would involve the reconstruction of the existing U.S. 10 between the towns of Eastern and Western for a distance of about 20 miles.

Improvements to the corridor are considered necessary to provide for the existing and projected traffic demand. Also included in this proposal is the replacement of the existing East End Bridge and a new interchange with Washington Highway 20 (W.H. 20) west of Eastern. Alternatives under consideration include (1) taking no action; (2) using alternate travel modes; (3) widening the existing two-lane highway to four lanes; and (4) constructing a four-lane, limited access highway on new location. Incorporated into and studied with the various build alternatives will be design variations of grade and alignment.

Letters describing the proposed action and soliciting comments will be sent to appropriate Federal, State, and local agencies, and to private organizations and citizens who have previously expressed or are known to have interest in this proposal. A series of public meetings will be held in Eastern and Western between May and June 1985. In addition, a public hearing will be held. Public notice will be given of the time and place of the meetings and hearing. The draft EIS will be available for public and agency review and comment prior to the public hearing. No formal scoping meeting is planned at this time.

To ensure that the full range of issues related to this proposed action are addressed and all significant issues identified, comments, and suggestions are invited from allinterested parties. Comments or questions concerning this proposed action and the EIS should be directed to the FHWA at the address provided above.

(Catalog of Federal Domestic Assistance Program Number 20.205, Highway Planning and Construction. The regulations implementing Executive Order 12372 regarding intergovernmental consultation on Federal programs and activities apply to this program.)

Issued on: March 26, 1985.

John Doe
Division Administrator
Capital

S A M P L E 2

[4910-22]

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

ENVIRONMENTAL IMPACT STATEMENT: WASHINGTON COUNTY, WASHINGTON

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Notice of Intent.

P-047-034

SUMMARY: The FHWA is issuing this notice to advise the public that a supplement to a final environmental impact statement will be prepared for a proposed highway project in Washington County, Washington.

FOR FURTHER INFORMATION CONTACT: James West, District Engineer, Federal Highway Administration, 400 Market Street, State Capital, Washington 98507, Telephone: (206) 222-2222.

SUPPLEMENTARY INFORMATION: The FHWA, in cooperation with the Washington Department of Transportation and the Washington County Highway Department, will prepare a supplement to the final environmental impact statement (EIS) on a proposal to improve U.S. Route 10 (U.S. 10) in Washington County, Washington. The original EIS for the improvements (FHWA-WA-EIS-85-06-F) was approved on December 21, 1985. The proposed improvements to U.S. 10 provide a divided four-lane, limited access highway on new location between the towns of Western and Eastern for a distance of about 20 miles. Improvements to the corridor are considered necessary to provide for existing and projected traffic demand.

The location and preliminary design of the western 15 miles portion of the proposed facility, from Western to U.S. 20, have been approved. However, substantial changes in the local street system and land use development in Eastern have reduced the suitability of the approved location east of U.S. 20. The portion of the proposed facility east of U.S. 20 is now to be restudied to determine if a new route location and connection to I-90 would be appropriate.

Alternatives under consideration include (1) taking no action and terminating the facility at U.S. 20; (2) constructing a four-lane, limited access highway on the approved location; (3) widening the existing two-lane U.S. 10 to four lanes with a connection to U.S. 20; and (4) constructing a four-lane, limited access highway on new location and connecting to I-90. Incorporated into and studied with the various build alternatives will be design variations of grade and alignment.

Letters describing the proposed action and soliciting comments will be sent to appropriate Federal, State, and local agencies, and to private organizations and citizens who havepreviously expressed or are known to have interest in this proposal. A public meeting will be held in Eastern in August 1987. In addition, a public hearing will be held. Public notice will be given of the time and place of the meeting and hearing. The draft supplemental EIS will be available for public and agency review and comment prior to the public hearing. No formal scoping meeting will be held.

To ensure that the full range of issues related to this proposed action are addressed and all significant issues identified, comments and suggestions are invited from all interested parties. Comments or questions concerning this proposed action and the EIS should be directed to the FHWA at the address provided above.

(Catalog of Federal Domestic Assistance Program Number 20.205, Highway Research, Planning, and Construction. The regulations implementing Executive Order 12372 regarding intergovernmental consultation on Federal programs and activities apply to this program.)

Issued on: April 23, 1987.

John Doe
Division Administrator
Capital

Hines, Maurice

From: Tiffany Couch [TCouch@acuityforensics.com]
Sent: Monday, October 24, 2011 10:15 PM
To: Columbia River Crossing
Subject: FEIS Comments

P-048-001

We have an opportunity at this point in time to call a time out to the CRC project and to put this project back on track. Traffic impediments in our area affect commerce and mobility.

The CRC Project Office purports that their current project will:

- Alleviate Congestion
- Improve Freight Mobility
- Improve Public Transportation (reliability, connectivity)
- Provide a Safer Crossing
- Improve bicycle and pedestrian access
- Improve seismic vulnerability

When you read the words on the immaculate reports that this office has created, they all ***sound just right.*** They ***sound*** exactly like the solutions most of us are looking for.

However, when one just simply scratches the surface, it becomes apparent that the words are just that….words. The work that has been performed by numerous experts (many of whom remain unpaid); has uncovered astounding anomalies in the work performed by the CRC Project Office. In fact, the body of work presented by outside experts causes one to realize that the "purpose and need" of this CRC project isn't being addressed at all.

From the start, there have been serious breakdowns in process:

P-048-002

- When an agency is charged with spending precious taxpayer dollars, mustn't that agency also have proper financial reporting? **The CRC has no basic financial statements.** In fact, reporting from their accounting system has uncovered problems reconciling total project expenditures.

P-048-003

- When an agency realizes a project must be completed using outside contractors, mustn't there be proper bidding, contracting, and payment processes and procedures? **The CRC does not appear to have followed basic contracting principles**. Why did only a single bidder submit qualifications? Why does it happen to be the same vendor who has been awarded all major

P-048-001

Significant work has gone into developing the CRC project, including an ongoing public involvement effort. The public involvement program includes numerous advisory groups to ensure that the values and interests of the community are reflected in project decisions. These groups include representatives of public agencies, businesses, civic organizations, neighborhoods, and freight, commuter and environmental groups. Feedback from the general public and advisory groups has been generally supportive of the project, including support for the transit, bicycle, pedestrian, highway, interchange, and financing elements of the project. See Chapter 2 (Section 2.7) of the FEIS for more discussion on the process used to develop project alternatives and select a Locally Preferred Alternative.

P-048-002

The project takes these charges very seriously. Recently the project has introduced new accounting measures and provides monthly updates on the project website. If there are specific financial data that you would like to review, please contact the project office.

P-048-003

Numerous other contractors work with both the Oregon and Washington DOTs. And, as the project prepares for the start of construction, new contractors will be selected, and the values of those contracts will, in fact, be larger than the contract for the alternatives analysis and environmental process. Much like with residential contracting (such as plumbers), the team that begins the work is often best able to complete the work and is most familiar with the data, related analyses, and negotiations among local agencies.

P-048-003

contracts in recent Oregon and Washington history? Why does it happen to be the same vendor who also did all of the previous "I-5" studies for WSDOT?

P-048-004

- When an agency pays bills, shouldn't all expenditures be tracked in the appropriate fund? **The CRC has not tracked all expenditures of this project in a separate fund**. So far, we have traced over $18M (of $125M) in unknown expenditures. The CRC project office has provided us a white paper explaining to a Certified Public Accountant what a "journal entry" is; but has not provided any reporting to explain the purpose of the journal entries that effectively transferred expenditures from one fund into the "CRC Fund".

P-048-005

The accounting anomalies we continue to uncover are truly astounding. But what is most astounding is the body of evidence produced by other experts who have pointed out ***significant*** issues with this project. When this many significant issues arise, governing bodies must call a time out, call attention to the issues, and work to solve them.

Other experts have pointed out the following:

- **The Rose Quarter Bottleneck**
  - The bottleneck at the Rose Quarter is currently (and will continue to be) a significant bottleneck on the I-5 Corridor. An independent study commissioned by the City of Portland (http://portlandtransport.com/documents/URS_CRC_Report_July_7_2010.pdf) as recently as 2010 indicates that southbound commuters will save ***1 minute*** on their southbound commute. The primary cause of this is related to the bottleneck at the Rose Quarter…where traffic narrows to two through lanes and one dedicated exit lane.
- We've heard Ms. Boyd indicate that the CRC Project can't "fix everything" at once; however, there are NO PLANS to fix the Rose Quarter Bottleneck.

- **Bridge Design Issues**

P-048-006

  - The Independent Review Panel indicated that the bridge that had been planned for could not be built. http://www.columbian.com/news/2011/feb/03/engineers-report-endorses-crossing-project/

P-048-007

  - Mr. Kevin Peterson, an expert on numerous international projects, has put forth a bridge design that could be built more safely and more cost-effective than the current project. Yet, the Project Office did not fully study this design (as required by NEPA).

P-048-004

The Columbia River Crossing project is a joint project of the Oregon and Washington state departments of transportation. ODOT and WSDOT provide financial accounting services and oversight for the project in compliance with applicable state and federal laws, regulations and policies. Expenditures on the CRC project by ODOT and/or WSDOT are tracked within department accounting systems using unique identifiers which allow for project specific reporting.

In response to public records requests, the project has worked with ODOT and WSDOT accounting and other offices to gather and provide complete project expenditures lists, contracts and invoices as specifically requested, as well as respond to questions about the data and information provided. There are no unknown expenditures. Journal vouchers are used to conduct accounting transactions between subsystems which interface with WSDOT's accounting system. Expense detail for any specific journal voucher is available and retained according to approved retention schedules by WSDOT. The project office uses software to manage the project day-to-day. This software is used to track project finances for project management purposes. Information in this software is reconciled with the accounting records of each state monthly.

P-048-005

The Oregon Department of Transportation (ODOT) completed Phase I construction of the I-5 Delta Park widening project in fall 2010. Phase I of the project involved widening I-5 and lengthening the entrance and exit ramps at Victory Boulevard and Columbia Boulevard. Phase II involves improving local streets and will begin when funding is secured. Phase I of the Delta Park project widened the current 2-lane segment of southbound I-5 to 3 lanes. There are currently no immediate plans to widen I-5 south of Delta Park. Neither the CRC project nor the Delta Park projects are intended to address the southbound traffic congestion that currently exists near the I-5/I-405 split. However, traffic analyses

P-048-007

(Please contact me for white paper(s) submitted by Mr. Peterson over the last 18 months).

- **Financing Issues**

P-048-008

  - Mr. Joe Cortright, an economist in Portland conducted an extensive study. His findings indicate that the Project Office has used significantly flawed assumptions AND out of date traffic studies, creating a potential $500M revenue shortfall.
  - Oregon State Treasurer's office commissioned a study by two separate experts who concurred.

- **Total Cost**

P-048-009

  - Mr. Cortright points out that financing costs (interest, finance charges, etc.) have not been included in reports to the product. The costs could exceed $2B.
  - Operation and Maintenance Costs for the bridge, rail lines, and tolling facilities are NOT included in the price of the bridge.
  - Total costs of the bridge, financing costs, and O&M costs, are estimated to exceed ***$10B.***
  - Please contact me for Mr. Cortright's Study

- **Transit Issues**

P-048-010

  - Light Rail Times from downtown Vancouver to downtown Portland will exceed CURRENT express bus lines and will exceed current single occupancy vehicle times. (By 15 to 20 minutes ***per trip).***
  - Light Rail has been voted down
  - The Light Rail portion of this project is estimated to cost in excess of $1 Billion
  - Light Rail is highly subsidized and expensive
  - Buses, BRT, and other options are less expensive!
  - Please contact me for studies related to transit issues

- **Bidding and Contract Issues**

P-048-011

  - Only a single vendor (David Evans) submitted a bid for this project
  - The Call for Consultants indicate the EIS project will "exceed $20M"
    - Funding available was just $6 M
  - Contract for $50M is executed less than 90 days after call for consultants
    - Current Contract is slated at ***$105M.***

show the congestion at the split will not be worsened because of the Columbia River Crossing project. The main reason is that fewer cars are expected to cross the river with a project in 2030 than without a project. This is due to the provision of improved transit service and tolling.

Beyond the CRC and Delta Park projects, the I-5 Transportation and Trade Partnership Final Strategic Plan recommended a comprehensive list of modal actions relating to: additional transit capacity and service; additional rail capacity; land use and land use accord; transportation demand/system management; environmental justice; additional elements and strategies (such as new river crossings); and financing. RTC and Metro are tasked with initiating recommendations as part of their regional transportation planning role. Examples of current efforts include RTC's evaluation of future high-capacity transit in Clark County, and evaluation of needs for future river crossings. Regional planners have investigated solutions to existing bottlenecks at the I-5 connections with I-405 and I-84. ODOT is responsible for conducting ongoing studies to identify other congestion problems on I-5 in Oregon that may need to be addressed in the future.

P-048-006

The Bridge Expert Review Panel considered the suggestions from the Independent Review Panel, and recommended three bridge types to the project. The Selected Alternative includes one of those types, as discussed in Chapter 2 of the FEIS.

P-048-007

Mr. Peterson's proposal was considered. Please see the responses to his comments (P-029 and P-030).

P-048-008

The CRC project is subject to the same review and audit procedures as

- **Lack of Financial Statements and Accountability**

P-048-012
  - No financial statements for this project have been created
  - Data provided purporting to show 100% of all CRC expenditures does not reconcile to "Prolog" reports provided by the CRC project office.
  - Project office has refused and/or has been remiss in providing ***basic*** accounting data (contracts, invoices supporting payment, etc.)

- **Unclear Funding Sources**

P-048-013
  - The funds being used to pay for this single project could be better spent by "spreading the wealth" to various parts of the state where critical needs can be met
  - There is much uncertainty in the federal budget; will we even have funding for this project.
  - There is NO INFORMAITON Provided as to who is going to bear the cost of any costs in excess of $3.2B

P-048-014 **At what point are the local leaders and decision makers going to say "Enough is Enough". I urge you to sit down with experts who are providing you with the warnings related to inefficiencies, and the anomalies associated with this project. I urge you to take a look at your funding. Is it prudent to spend all of our money in a single place, or might there be prudent alternatives to the current congestion situation here; yet enough dollars to spread to fix aging and failing areas along other trade routes in the States of Washington and Oregon?**

Thank you for your consideration.

Best regards,
Tiffany

Tiffany R. Couch, CPA/CFF, CFE
Principal
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www.acuityforensics.com

other projects under the authority of the lead agencies. Additionally, Governors Kitzhaber and Gregoire, and Oregon and Washington legislators, have made it clear that they will review every element of this project and provide oversight and accountability. The governors and legislative leaders are discussing the scope of interim legislative oversight committees. At Governor Kitzhaber's request, the Oregon State Treasurer conducted an independent review of the CRC's financing plan and released a report in July 2011. CRC incorporated the treasurer's recommendation in Chapter 4 of the Final EIS.

The traffic projections which have been called into question are the same traffic projections which are used for all growth management and infrastructure sizing efforts in the Metro area. In fact, the project is required to base its traffic projections on these local plans and studies. The potential for a slower-than-projected rise in trips has been considered. Even if the projections are high, the facility is intended to serve mobility needs for 100 years. Therefore, even if it takes an additional five or ten years to reach the projected levels, the facility has still been appropriately sized.

P-048-009

The FEIS Finance Chapter (Chapter 4) provides a table (Exhibit 4.4-3, page 4-18) with revenue sources and amounts to cover costs expected for four scenarios (LPA med; LPA high; LPA with highway phasing med; LPA with highway phasing high). These scenarios range in total revenue needed from $3.2 - $3.8 billion.

Mr. Cortright has included costs in his estimates which are not appropriate. The capital (construction) costs for a project should not include maintenance and operations costs, though these too are discussed in the Finance Chapter. Mr. Cortright's estimates include costs to rebuild the Rose Quarter area of I-5, which is not part of the CRC project.

'Whenever you see a successful business, someone once made a courageous decision." - Peter Drucker

P-048-010

The FEIS compares light rail transit travel time in year 2030 to bus rapid transit travel times in year 2030 and finds that light rail will offer a quicker trip than bus rapid transit. It is not applicable to compare future travel times (light rail) to existing conditions (express buses). Congestion on I-5 will increase as more vehicles travel on the highway, therefore increasing the travel times of express buses, which use standard traffic lanes.

Light rail has been endorsed by every local Sponsoring Agency (Vancouver City Council, C-TRAN, RTC, Portland City Council, TriMet, and Metro), whose boards include elected leadership from throughout the area.

Annual light rail passenger trips crossing the I-5 bridge in 2030 are projected to be 6.1 million, with daily ridership around 18,700. The travel time for the morning commute by light rail between downtown Vancouver and Pioneer Square in downtown Portland will be approximately 34 minutes. Light rail would travel on a dedicated right-of-way, with more reliable travel times than auto drivers dealing with unpredictable road conditions, traffic congestion, and parking challenges.

The CRC project planning for light rail incorporates and supports the principles of Vancouver's City Center Vision Plan. Downtown Vancouver has seen recent growth in higher density mixed use projects from three to 12 stories in height. In addition, another 4,000 downtown condominiums are proposed or pending as part of new developments. The core of Vancouver has, along with many of the larger corridors such as Fourth Plain Blvd, medium to high density residential development and an urban mix of uses. Transit demand in these areas is quite high, and ridership will increase with the introduction of light rail.

As described in Chapter 3 (Section 3.1) of the DEIS, the operations and

maintenance (O&M) costs associated with light rail (LRT) would be less than those associated with bus rapid transit (BRT), largely because LRT operates on electricity while BRT is dependent on the volatile fuel market. LRT costs approximately $3.50, or 31%, less than BRT, per incremental rider when comparing both capital and operating costs.

Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on having a public vote.

P-048-011

Past financial performance is an important issue but is not relevant to the NEPA review process. The Record of Decision concludes the NEPA analysis. It indicates which alternative has been selected by the federal government, and allows for the continued design, eligibility for federal funding and permitting, and eventual construction of that alternative. The Locally Preferred Alternative is supported by local, regional, state, and federal agencies and has been selected following an exhaustive analysis and public involvement program.

The project takes the issues of financial management very seriously. Project staff have provided you with considerable records and reports and has responded to your inquiries. The project is currently developing new financial reporting mechanisms and has started providing monthly reports on the internet. The project will continue to work with the public to improve transparency and an understanding of the resources required for an undertaking of this scale.

The contracting process and any increases in contracting limits includes oversight by the project directors, WSDOT headquarters and legal counsel. The procurement process that resulted in selection of a General Engineering Consultant for the CRC project was open and competitive.

Contracting limits with the selected General Engineering Consultant (GEC) have been increased over time due to a variety of factors. WSDOT's contracting limit is $50 million to allow the agency to assess if work is being conducted well and provides the best value before increasing the contract limit. Funds cannot be committed to a contract or agreement before they have been allocated. At the beginning of the NEPA phase, when the consultant agreement was initially executed, there were many unknowns – including the number of alternatives to be studied. As a result, the entire scope of the project was unknown increasing the need for contract changes over time.

P-048-012

Please see the responses to your similar comments above.

P-048-013

As the only continuous north-south Interstate on the West Coast connecting the Canadian and Mexican borders, I-5 is vital to the local, regional, and national economy. The I-5 crossing also provides the primary transportation link between Vancouver and Portland, and the only direct connection between the downtown areas of these cities. As described in the DEIS, serious problems face this important crossing, including growing congestion, impaired freight movement, limited public transit options, high auto accident rates, substandard bicycle and pedestrian facilities, and vulnerability to failure in an earthquake. The fact that other important issues face our communities does not diminish the importance of addressing the problems plaguing the I-5 crossing.

CRC assumes funds allocated to other projects would remain dedicated to those projects, and anticipates needing to find new funds to finance the project. Funding for the project will come from a variety of sources including federal grants that would not be available to other transportation projects in the region, State of Oregon, State of Washington, and regional and local sources. In addition, it is assumed

that the replacement bridge will be tolled. Please refer to Chapter 4 of the FEIS for a description of the current plans for funding construction and operation of the LPA.

P-048-014

There has been considerable input from independent experts and the project has made changes based on that input, as discussed in Chapter 2 of the FEIS. Please see the responses to your comments above.

Hines, Maurice

From: Dan Coursey [ascente@comcast.net]
Sent: Sunday, October 23, 2011 9:35 PM
To: Columbia River Crossing
Subject: CRC Project Feedback -- NO ON LIGHT RAIL

Dear Sirs:

P-049-001 You are trying to shove Light Rail down the throats of Clark County, even though we have been exceedingly clear in telling you we don't want it here. Three times Clark county has voted this down and here you are trying to make and end-run around us by manipulating some of the local politicians.

Those politicians are going to pay a price at the voting booth for what they are doing. We have a long memory.

P-049-002 In the meantime, when Initiatiatve 1125 (tolling prohibitions) pass in Washington State you can be assured you were responsible. Also when Proposition-1 in Clark County, for increasing the tax rate for C-Tran bus transit fails miserably, you again can be assured you were responsible. We continue to petition our Federal representatives and State representatives to deny any funding for the CRC as long as it includes Light Rail. We don't like bullies in Clark county.

Sincerely,

Daniel and Margaret Coursey
4842 Dr Eldridge Drive
Washougal, Washington

P-049-001

Light rail has been endorsed by every local Sponsoring Agency (Vancouver City Council, C-TRAN, RTC, Portland City Council, TriMet, and Metro), whose boards include elected leadership from throughout the area.

Annual light rail passenger trips crossing the I-5 bridge in 2030 are projected to be 6.1 million, with daily ridership around 18,700. The travel time for the morning commute by light rail between downtown Vancouver and Pioneer Square in downtown Portland will be approximately 34 minutes. Light rail would travel on a dedicated right-of-way, with more reliable travel times than auto drivers dealing with unpredictable road conditions, traffic congestion, and parking challenges.

The CRC project planning for light rail incorporates and supports the principles of the Vancouver's City Center Vision Plan. Downtown Vancouver has seen recent growth in higher density mixed use projects from three to 12 stories in height. In addition, another 4,000 downtown condominiums are proposed or pending as part of new developments. The core of Vancouver has, along with many of the larger corridors such as Fourth Plain Blvd, medium to high density residential development and an urban mix of uses. Transit demand in these areas is quite high, and ridership will increase with the introduction of light rail.

Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on having a public vote.

P-049-002

The tolling initiative failed and the Transit funding proposition passed.

Tom Dana
1501 N Hayden Island Dr #110
Portland, OR 97217
ThomasHDana@gmail.com
503-954-9217

October 22, 2011

Heather Wills
Columbia River Crossing
700 Washington Street, Suite 300
Vancouver, WA 98660

re: FEIS Comments

Greetings,

P-050-001

To begin I want to express my support for LPA Option A. A new bridge is necessary to alleviate the traffic congestion of the current I-5 bridge.

Currently life on the Island is very relaxing and easy going with a small town feel to it. Except for the traffic rush during the November/December shopping season the Island is easy to get around. But this will change starting with the construction of the new bridge.

The loss of Safeway, our full service grocery store on the Island is not being fully replaced by the new Target store which will only have partial fresh meats, fruits, and vegetables. And at present it doesn't look like the mall will lease to another full service grocery store. We are losing our only gas station. We are losing our car wash. We are losing one of our two banks. We are losing most of our low cost restaurants. The central part of the Island will change from easy driving with few traffic lights to stop and go driving with traffic lights and restricted turn lanes. The Island will be split in two by a massive interchange of on-ramps and off-ramps for both the Island and the Marine Drive interchange. The Hayden Island Plan's area for local commercial is being covered by storm water runoff ponds. The Manufactured Home Community is an Environmental Justice Community and this is not recognized in the FEIS. The Island will endure 5 to 10 years of construction and disruption to our community and the ensuing noise, difficulty getting around, dust pollution, air pollution, and loss of businesses will take its toll on our community.

With varying degrees of satisfaction most of these losses are touched upon in the FEIS, but what is not dealt with at all is the gestalt of the whole devastating package put together. And there is no mitigation specified for this whole package.

To this end a community enhancement fund would be a first step towards mitigating the whole package. One possibility is to have a community center for the Island which during construction would provide information about road closers and provide assistance to the elderly and mobility challenged. One suggestion from the transit consultant Greg Baldwin was to have some of the community enhancements completed at the start of construction so that we could feel something of the project completion ahead of time. A possibility for this would be a pocket park with a construction viewing area so we could watch the construction in progress. Also some of the retail around the transit station could be arranged at the start of construction. A possibility here would

P-050-001

In the last three years the CRC project team, the Project Sponsors Council, and CRC advisory groups have focused on incorporating a wide range of community enhancements into the project. The project has looked for ways to leverage the highway and transit investments into additional improvements for project neighbors and local communities. These improvements are beyond the benefits identified as the project's purpose and need. These tangible improvements include new local roads and improved local flow and connections for Hayden Island residents; better bike and pedestrian access to the improved facilities; new bike and pedestrian trails; and a separate bridge for local auto access from North Portland to Hayden Island. We know there is more to be done. The CRC remains committed to aggressively maximizing and leveraging resources to bring additional benefits and improvements to our community.

Two options have been identified for further exploration; both include a financial set-aside of a specific amount dedicated to a specific purpose. One approach is a project-specific community enhancement fund. There is some history with such an approach - the Delta Park 1-5 widening project (2006) and Metro's solid waste program (1991) are two examples. The other approach is a different concept, a regional fund established by the state to benefit the neighborhoods and communities in close proximity to 1-5 and the CRC project. Both approaches have been successfully implemented in the Portland region and will help inform this effort. We need to be clear about both of these approaches - neither will be easy. Both approaches have limitations and legal restrictions associated with anticipated funding sources. Both will require legislative support. Both will likely need enabling legislation and both will require funding.

P-050-001 be food carts which would serve both the construction personnel as well as the local residents and Island visitors.

A community enhancement fund which does as much as is possible at the start of construction will go a long way towards easing the 5 to 10 year negative impact of the project.

Thank you

Tom Dana

Hines, Maurice

From: mw.durrell@comcast.net
Sent: Monday, October 24, 2011 10:19 PM
To: Columbia River Crossing
Subject: CRC - Environmental impact concern

P-051-001 My concern relates to the impact on environment by spending billions on the CRC with such a low return.

P-051-002 I-5 traffic has not increased as projected.

P-051-003 Light rail is light capacity and does little to reduce traffic.

P-051-004 The costs and impact of CRC on businesses are immense.

P-051-005 This project will spend billions of borrowed money and disrupt the environment for no good reason.

Mark Durrell
Camas, WA

P-051-001

As the only continuous north-south Interstate on the West Coast connecting the Canadian and Mexican borders, I-5 is vital to the local, regional, and national economy. The I-5 crossing also provides the primary transportation link between Vancouver and Portland, and the only direct connection between the downtown areas of these cities. As described in the DEIS, serious problems face this important crossing, including growing congestion, impaired freight movement, limited public transit options, high auto accident rates, substandard bicycle and pedestrian facilities, and vulnerability to failure in an earthquake. The fact that other important issues face our communities does not diminish the importance of addressing the problems plaguing the I-5 crossing.

CRC assumes funds allocated to other projects would remain dedicated to those projects, and anticipates needing to find new funds to finance the project. Funding for the project will come from a variety of sources including federal grants that would not be available to other transportation projects in the region, State of Oregon, State of Washington, and regional and local sources. In addition, it is assumed that the replacement bridge will be tolled. Please refer to Chapter 4 of the FEIS for a description of the current plans for funding construction and operation of the LPA.

P-051-002

Traffic forecasts reported in the DEIS and used to inform decisions on a locally preferred alternative were derived from adopted regional employment and population forecasts and state-of-the-art modeling and evaluation conducted by Metro, RTC and the project team. These traffic forecasts were reviewed by all project sponsor agencies as well as FTA and FHWA. In addition, an independent panel of traffic modeling experts was convened in October 2008 to review the modeling methods and findings. These experts concluded that the project's approach to estimating future travel demand was reasonable and that it relied on

accepted practices employed in metropolitan regions throughout the country. These findings are summarized in the “Columbia River Crossing Travel Demand Model Review Report” (November 25, 2008). This independent review confirmed the approach CRC modeling used to address multiple variables that can affect travel demand, including gasoline prices, tolling, travel demand measures, and induced development.

P-051-003

Light rail has been endorsed by every local Sponsoring Agency (Vancouver City Council, C-TRAN, RTC, Portland City Council, TriMet, and Metro), whose boards include elected officials from throughout the area.

Annual light rail passenger trips crossing the I-5 bridge in 2030 are projected to be 6.1 million, with daily ridership around 18,700. The travel time for the morning commute by light rail between downtown Vancouver and Pioneer Square in downtown Portland will be approximately 34 minutes. Light rail would travel on a dedicated right-of-way, with more reliable travel times than auto drivers dealing with unpredictable road conditions, traffic congestion, and parking challenges.

The CRC project planning for light rail incorporates and supports the principles of Vancouver's City Center Vision Plan. Downtown Vancouver has seen recent growth in higher density mixed use projects from three to 12 stories in height. In addition, another 4,000 downtown condominiums are proposed or pending as part of new developments. The core of Vancouver has, along with many of the larger corridors such as Fourth Plain Blvd, medium to high density residential development and an urban mix of uses. Transit demand in these areas is quite high, and ridership will increase with the introduction of light rail.

Long-term operation and maintenance of the new light rail line will be

funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on having a public vote.

P-051-004

The impacts of the proposed project on businesses are discussed in Section 3.4 of the FEIS. While there will be commercial displacements and other impacts, it is presumed that the investment in infrastructure will directly benefit the local and regional economy in many ways.

P-051-005

The FEIS discusses the reasons for the proposed action (Chapter 1) and discusses the environmental impacts (Chapter 3), which include adverse as well as beneficial impacts.

From: John Eichler [mailto:Eichler4@comcast.net]
Sent: Friday, September 16, 2011 8:29 AM
To: Columbia River Crossing
Subject: Question on design of bridge

P-052-001 Is it not possible to make this a 2 deck bridge doubling the lanes heading in each direction? I do realize this would require a significant build-out of the freeways, and create an issue with merging lanes eventually, but has it been looked at?

P-052-001

The project has evaluated alternatives with up to, but not more than, 6 lanes in each direction across the bridge, and the selected alternative would build 5 lanes in each direction. The selected alternative also has a double deck bridge (two parallel structures) with highway lanes on the 2 top decks and light rail transit and a pedestrian and bicycle path underneath. The project has looked at stacked highway lanes, as Mr. Eichler suggested. However, aviation and navigation constraints would require the facility to land further from the Columbia River, perhaps missing Hayden Island, and would add significant costs.

Hines, Maurice

From: Gerald Fox [gdfox@q.com]
Sent: Thursday, October 20, 2011 10:19 AM
To: Columbia River Crossing
Subject: Comment on FEIS

Categories: Red Category

Greetings,

P-053-001 I'm really concerned that the present CRC proposal is wrong, and a huge waste of money we don't have.

The project claims it will alleviate congestion, which is difficult to understand. If you ever use the Portland freeway system you will know that there are numerous congestion points regionwide. If the CRC enables more traffic to enter the system, it will aggravate travel for everyone in the region. Congestion, air pollution, greenhouse gases will all soar. The FEIS ignores this, by limiting study to arbitrarily defined "project limits".

P-053-002 If, on the other hand, the CRC limits traffic (by tolls/congestion pricing) to existing levels or less, to maintain free flow on I-5, then why do we need to spend $4.0 billion on a new bridge ?

P-053-003 A supplementary bridge could provide relief to the existing bridge at a fraction of the cost.

I think we should stop the present waste of tax money, and devise a solution that is cost effective, and consistent with the real needs of the 21st century.

Gerald Fox

P-053-001

The proposed new add/drop lanes (i.e., lanes that connect two or more interchanges) are used to alleviate safety issues associated with the closely spaced interchanges in the project area and are not designed to increase capacity generally on I-5. 68 to 75% of I-5 traffic enters and/or exits I-5 within the CRC project area, and these add/drop lanes provide space for this traffic to do so without disrupting cars and trucks traveling to destinations further north and south of the project area. The project does not propose to add lanes north or south of the project limits.

The DEIS evaluation found that the project, with a toll and light rail, would actually reduce the total daily volume of traffic using the I-5 and I-205 river crossings by approximately 3%. The FEIS analysis of the project has been updated to include an evaluation of how the CRC project would affect Vehicle Miles Traveled (VMT) (see Chapter 3, Section 3.1). Rather than inducing sprawl, the CRC project will likely reinforce the region's goals of concentrating development in regional centers, reinforcing existing corridors, and promoting transit and pedestrian friendly development and development patterns. In 2010, Metro ran the MetroScope model (an integrated land use and transportation model) to forecast growth associated with transportation improvements of a 12-lane river crossing and light rail to Clark College. The model showed only minimal changes in employment location and housing demand compared to the No-Build. For more information see FEIS Chapter 3, Section 3.4.

Though there are numerous congested areas in the region, this area has been identified by many agencies as requiring a comprehensive solution.

P-053-002

While tolls and the extension of high capacity transit will reduce the demand for the Interstate river crossing, demand and throughput on the bridge will certainly increase. Alternatives which did not replace the

Hines, Maurice

From: Gerald Fox [gdfox@q.com]
Sent: Thursday, October 20, 2011 10:31 AM
To: Columbia River Crossing
Subject: CRC

Categories: Red Category

Hi,

P-053-004 I'm a retired transportation engineer, and I've been following the CRC project with a growing sense of dismay and foreboding. Seems it's all about building a big new bridge, regardless of cost, and not about solving the problems identified in the Purpose and Need in a manner appropriate to our region, and the transportation needs of the 21st century.

We already have 14 freeway lanes across the Columbia River. The CRC project would give us 18 lanes, at a cost of $4.0 billion. The project never considered an alternative emphasizing Alternative Transportation, which is the main goal of transportation planning everywhere else in the region.

P-053-005 The committees selecting alternatives were stacked to support the "Big Bridge" cause, and dissent was ignored or suppressed. Some staff were reportedly threatened !!

P-053-006 The existing bridge has already had one seismic retrofit, and is in better condition than many other highway bridges. What a waste of public money to tear it down when a supplementary bridge could relieve congestion at far less cost, and far fewer negative consequences.

Gerald Fox

1

bridge and increase capacity fail to satisfy the adopted Purpose and Need for the project.

Following the selection of the LPA in July of 2008, the CRC Project Sponsors Council (PSC) was developed to provide recommendations to the project on a variety of issues, including the number of add/drop lanes over the river crossing. Over the course of several months, PSC was provided with operational characteristics and potential environmental impacts of 8-, 10-, and 12-lane options. Technical evaluation criteria included, but were not limited to, traffic safety, congestion, traffic diversion onto local streets and I-205, regional vehicle miles travelled, transit ridership, regional economic impact, effects to neighborhoods and protected species and habitats. In additionto the technical information, PSC received input from CRC advisory groups and reviewed public comment submitted to the project and obtained during two public Q&A sessions in January 2009 regarding the number of lanes decision, as well as hearings conducted by Portland City Council and by Metro Council. In August 2010, the PSC voted unanimously to recommend that the replacement bridges be constructed with 10 lanes and full shoulders. For more information regarding the number of lanes decision making process, see Chapter 2 (Section 2.7) of the FEIS.

P-053-003

A supplemental bridge was studied in the EIS. See Chapter 2 of the FEIS, as well as the Record of Decision, for a discussion of why a supplemental bridge is not part of the preferred alternative.

P-053-004

Many ideas involving low investment in highway alternatives were considered during the early evaluation of alternatives. See Chapter 2 of the FEIS. In the DEIS and FEIS, Alternatives 4 and 5 put much more emphasis on high capacity transit and TSM/TDM and much less on highway improvements. These alternatives had only one new auxiliary

Hines, Maurice

From: Gerald Fox [gdfox@q.com]
Sent: Thursday, October 20, 2011 10:37 AM
To: Columbia River Crossing
Subject: CRC

Categories: Red Category

P-053-007

The CRC project makes much of the "Trade Corridor" from Canada to Mexico, on which the CRC is supposedly a barrier and embarrassment. Except that it isn't. Through traffic on I-5 is routed onto I 205 around Portland, because I-5 through Portland has numerous choke points. The CRC is only one of them, and the source of only a small percentage of the daily freeway delays in Portland. If the CRC is built, through traffic will still be routed round I-205, because there will still be no more capacity at all the other choke points, regardless of how many lanes there are on the $4.0 billlion bridge.

I haven't seen this disclosed anyewhere.

Gerald Fox

lane in each direction across the river, had double the HCT service levels, and had higher highway tolls. Modeling indicated significantly worse congestion with these alternatives and only slightly better transit ridership. Transit cost effectiveness was much poorer for these alternatives than for the other build alternatives in the DEIS.

P-053-005

Multiple methods have been used to engage the public so as to address the needs of a wide variety of people in the project decision-making process. Public feedback has helped guide the outreach effort. Examples include workshops with facilitated small-group discussions, open houses where participants can talk one-on-one with staff, public hearings, presentations and discussions at community and neighborhood-sponsored meetings (often at the group's request), and advisory group meetings where CRC seeks recommendations from a citizen committee. These events and meetings have taken place at a variety of locations, days of the week, and times of the day to meet the needs of the entire community. For more information on the project's public outreach, please see Appendix B (Public Involvement) of the FEIS.

P-053-006

The supplemental river crossing would not substantially improve congestion over No-Build, would maintain some substandard and unsafe design features, and would not be substantially cheaper to construct than a replacement river crossing, as originally believed. See the discussion of seismic safety issues of the existing bridges in the following reports available through CRC: Columbia River Crossing, Panel Assessment of the Interstate Bridges Seismic Vulnerabilities, December 2006; DGES Inc., ODOT - Interstate 5 Bridges over Columbia River Seismic Evaluation of Lift Span Unit, December 1994; DGES Inc., ODOT - Interstate 5 Bridges over Columbia River Seismic Retrofit of Truss Span Pier Foundations Conceptual Design and

Hines, Maurice

From: Gerald Fox [gdfox@q.com]
Sent: Thursday, October 20, 2011 10:43 AM
To: Columbia River Crossing
Subject: CRC

Categories: Red Category

P-053-008

The CRC project claims it will cut congestion, which will reach 15 hours a day if we don't build the Big Bridge.. Which is odd, because there is nowhere for any more peak hour traffic to go. According to Metro, Light Rail is supposed to carry 37% of peak hour trips across the bridge by 2030. And I-5 will presumeably carry pretty much what it carries today, at least beyond Columbia Boulevard.

So why not just build a supplementary bridge to relieve I-5, to carry local traffic, transit, and bikes at far less cost, and with far less environmental damage?

Gerald Fox

Estimate, February 1995; DGES Inc., ODOT - Interstate 5 Bridges over Columbia River Seismic Retrofit of Truss Span Bearings Conceptual Design and Estimate, March 1995.

P-053-007

The Vancouver-Portland region is a trade hub, acting as a gateway and distribution center for domestic and international markets. The region has become a trade hub, in large part, because of its direct access to the freeway system, navigable rivers, rail lines, and international air shipping. The region's continued competitiveness as a trade hub is dependent on the ability to efficiently move freight on and between these transportation facilities. Though I-205 is a convenient, cost-effective route for some freight trips, it cannot replace the role of I-5 as a freight route. For many freight trips, I-205 would be out of direction, adding to travel time and shipping costs. In addition, trucks will travel on I-5 because it is shorter and faster than I-205. In 2005, the I-5 Interstate Bridge carried approximately 3,240 more trucks per day or 42 percent more than the I-205 Glenn Jackson Bridge. Trucks try to avoid congestion and travel during uncongested periods, and because the travel distance on I-5 from junction to junction is only 19.3 miles compared to 25.5 miles on I-205, trucks will travel on I-5. Increased shipping costs can have a significant impact on the overall costs of doing business in our region, making us less competitive and threatening our status as a trade hub.

P-053-008

By 2030, the region's population is expected to increase by one million people. This increase will result in more people needing to travel between home, work, school, recreation, etc. In 2005, 135,000 vehicles crossed the Columbia River on the Interstate Bridge each weekday, which led to 4-6 hours of congestion. By 2030, 184,000 vehicles are predicted to cross the river each weekday, which would lead to 15 hours of daily congestion if no action is taken.

Hines, Maurice

From: Gerald Fox [gdfox@q.com]
Sent: Thursday, October 20, 2011 10:52 AM
To: Columbia River Crossing
Subject: CRC

Categories: Red Category

P-053-009

The CRC is said to reduce air pollution, greenhouses gases, and congestion, compared to the **No Build** alternative.

Unfortunately for the region and the local taxpayers, the Project manipulated the process to avoid studying an alternative based on Alternative Transportation. For instance of the 5 alternatives studied in exhaustive detail, two were simply using bus transit instead of rail for the purpose of distracting study participants, and claiming that surely 5 alternatives were enough. Of course an Alternative Transportation alternative would have accomplished the project "Purpose and Need" with less impacts, and a fraction of the cost, undermining the DOTs desire to build a really big bridge!

Time to stop this nonsense, and fix the disastrous proposals now before us.

Gerald Fox

1

Congestion occurs when vehicle demand is greater than a transportation system's capacity. It results in slower speeds and increased travel times. CRC defines congestion as vehicles traveling less than 30 mph. The Columbia River Crossing project uses information gathered from Metro's nationally-recognized travel demand models to determine the project's effect on congestion. These models predict trip frequency, types or modes of transportation, destination, and time of day. Transportation planners use these models to analyze the effects of such factors as increased population and employment, transportation improvements, and new developments on the transportation system.

Based on the Metro model's past ability to predict transportation effects, the CRC project is confident in the data received from Metro and uses it to determine what impact the project will have on congestion. The improvements proposed by the project to the highway and seven interchanges will help better accommodate increased future vehicle traffic. New auxiliary lanes and longer on/off ramps will allow safer and more efficient merging and weaving to enter or exit the freeway. Narrow lanes and shoulders will be widened to current standards. Shoulders will be added where they are currently missing. All of these changes will improve the flow of traffic in the bottleneck area of the Interstate Bridge.

Issues related to a supplemental bridge are addressed above.

P-053-009

See response to the comment above regarding the problems with the proposals that relied mostly or solely on alternative transportation to address the multiple transportation needs in the project area.

Hines, Maurice

From: Gerald Fox [gdfox@q.com]
Sent: Thursday, October 20, 2011 11:03 AM
To: Columbia River Crossing
Subject: CRC

Categories: Red Category

P-053-010 The CRC is supposed to generate thousands of much-needed jobs. Originally 20,000 jobs were claimed, but when that was challenged, the number became 2,000. And that doesn't count the hundreds of jobs lost because the project will destroy numerous businesses in Vancouver and Hayden Island. And that assumes the project will actually survive legal challenges, lack of money, and eventually the ballot box, and get built.

P-053-011 Many well informed critics have advocated an alternative based on Alternative Transportation principles. This will of course generate many jobs, as well as reduce the jobs lost through business destruction. And because such an approach will include several components, such as an improved railroad bridge, and a supplementary street bridge, it will likely come to construction sooner.

And because the Alternative Transportation alternative will cost less, it won't suck up all the available descretionary funds (and the jobs they could generate) elsewhere in the states of Oregon and Washington.

Let's get past this inappropriate project, and get on with something the will relieve congestion, and actually get built.

Gerald Fox

P-053-010

It is fairly standard to express projected employment from capital investments in terms of "job years". The early CRC estimate that it would generate about 20,000 jobs (job years) has not changed. What has changed is that the estimate has been broken down into the number of estimated full time employees per year (jobs per year) rather than the total number of job years for the full duration of project construction.

P-053-011

See responses above regarding alternative transportation proposals.

Hines, Maurice

From: Dennis Ghormley [dennis.ghormley@comcast.net]
Sent: Monday, October 24, 2011 5:28 PM
To: Columbia River Crossing
Subject: Fiscal Accountability

P-054-001

There should be a transparency in the fiscal accountability on this CRC and any public project. From what I have been able to determine, transparency is no where to be found!

Dennis Ghormley

P-054-001

The project is willing to meet and discuss detailed questions. The project can also send detailed financial information if requested.

Hines, Maurice

From: halverbk@comcast.net
Sent: Sunday, October 23, 2011 8:58 PM
To: Columbia River Crossing
Subject: Comment from CRC Submit Comments Page

From: Brad Halverson
E-Mail: halverbk@comcast.net
Comment or Question:

P-055-001

Thank you for completing the EIS! I endorse the modifications that have occurred since the DEIS was published. I do hope that if construction of some elements is deferred that their priority will be reassessed at that time so the problems left by their deferral will be dealt with in a logical progression.

Sincerely,

Brad Halverson
CRC Task Force member

P-055-001

If some elements of the project need to be phased, those decisions will include consideration of the timing of benefits and the effects that would have.

Hines, Maurice

From: Daniel Hoyer [lunch.rider@gmail.com]
Sent: Monday, October 24, 2011 4:48 PM
To: Columbia River Crossing
Subject: CRC

P-056-001

I want to add my voice to the people commenting on this project.
The EIS is flawed
The basic premis of the need for a new and larger bridge is flawed
Just build a simple bridge to Jansen Beach for non freeway traffic and TOLL the existing bridge

Daniel Hoyer

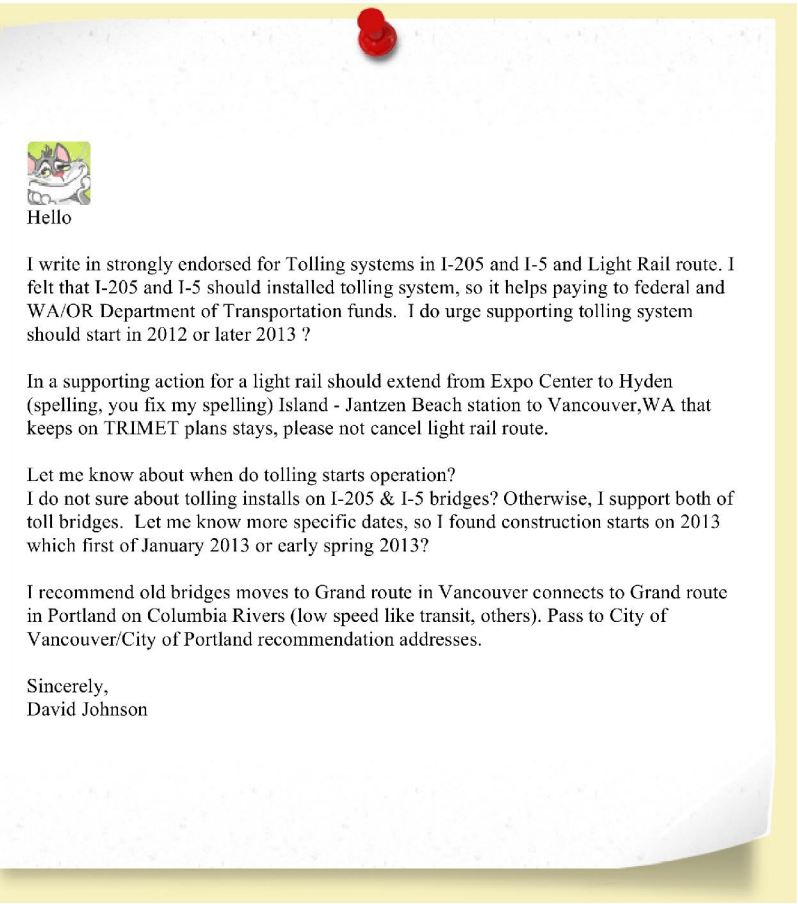
Portland

P-056-001

The transportation needs that the project addresses are described in Chapter 1 and further explained in Section 3.1 of the FEIS. The idea Mr. Hoyer mention was considered during CRC project evaluation and screening, as summarized in Chapter 2 of the FEIS.

Hines, Maurice

From: david4466@gmail.com
Sent: Tuesday, October 25, 2011 12:31 AM
To: Columbia River Crossing
Subject: Endorsed Tolling for I-205 & I-5 and LRT



Hello

P-057-001 I write in strongly endorsed for Tolling systems in I-205 and I-5 and Light Rail route. I felt that I-205 and I-5 should installed tolling system, so it helps paying to federal and WA/OR Department of Transportation funds. I do urge supporting tolling system should start in 2012 or later 2013 ?

P-057-002 In a supporting action for a light rail should extend from Expo Center to Hyden (spelling, you fix my spelling) Island - Jantzen Beach station to Vancouver,WA that keeps on TRIMET plans stays, please not cancel light rail route.

P-057-003 Let me know about when do tolling starts operation?
I do not sure about tolling installs on I-205 & I-5 bridges? Otherwise, I support both of toll bridges. Let me know more specific dates, so I found construction starts on 2013 which first of January 2013 or early spring 2013?

P-057-004 I recommend old bridges moves to Grand route in Vancouver connects to Grand route in Portland on Columbia Rivers (low speed like transit, others). Pass to City of Vancouver/City of Portland recommendation addresses.

Sincerely,
David Johnson

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P-057-001

Tolling I-205 is not part of this project, but could be implemented separately. With few exceptions, federal statutes do not permit tolling of an existing interstate highway without associated improvements. FHWA does have pilot programs that allow state departments of transportation to apply for approval to toll a facility.

Some form of tolling prior to constructing CRC may be implemented. The ultimate decision on any tolling options will be made by both the Washington and Oregon Transportation Commissions.

P-057-002

The LPA includes light rail from Expo Center to a terminus near Clark College in Vancouver, with a station on Hayden Island.

P-057-003

Regarding tolling I-205, please see P-057-001.

Modeling has indicated that tolling I-5 without making the improvements that are part of the CRC project would not meet the project's Purpose and Need. This does not mean that some form of tolling prior to constructing CRC couldn't be implemented. The ultimate decision on any tolling options will be made by both the Washington and Oregon Transportation Commissions.

P-057-004

Construction is expected to start in late 2013. See Chapter 2 of the FEIS for additional discussion of the expected construction schedule. The project will actively seek ways to reuse the existing bridges. However, because they include a lift span which impedes river navigation, they may not be used nearby. A separate analysis will start after the Record

of Decision is published, and there will be many alternate uses considered for the bridge.

-----Original Message-----
From: lesliejerryg@aol.com [mailto:lesliejerryg@aol.com]
Sent: Monday, September 26, 2011 9:46 AM
To: Columbia River Crossing
Subject: Comment from CRC Submit Comments Page

From: Jerry Leslie
E-Mail: lesliejerryg@aol.com
Comment or Question:

P-058-001 What is being done about the I-5 near the Rose Quarter. Untill this bottleneck is undone there should'nt be an improvement to make a bigger PROBLEM.

P-058-001

The Oregon Department of Transportation (ODOT) completed Phase I construction of the I-5 Delta Park widening project in fall 2010. Phase I of the project involved widening I-5 and lengthening the entrance and exit ramps at Victory Boulevard and Columbia Boulevard. Phase II involves improving local streets and will begin when funding is secured. Phase I of the Delta Park project widened the current 2-lane segment of southbound I-5 to 3 lanes. There are currently no immediate plans to widen I-5 south of Delta Park. Neither the CRC project nor the Delta Park projects are intended to address the southbound traffic congestion that currently exists near the I-5/I-405 split. However, traffic analyses show the congestion at the split will not be worsened because of the Columbia River Crossing project. The main reason is that fewer cars are expected to cross the river with a project in 2030 than without a project. This is due to the provision of improved transit service and tolling.

Beyond the CRC and Delta Park projects, the I-5 Transportation and Trade Partnership Final Strategic Plan recommended a comprehensive list of modal actions relating to: additional transit capacity and service; additional rail capacity; land use and land use accord; transportation demand/system management; environmental justice; additional elements and strategies (such as new river crossings); and financing. RTC and Metro are tasked with initiating recommendations as part of their regional transportation planning role. Examples of current efforts include RTC's evaluation of future high-capacity transit in Clark County, and evaluation of needs for future river crossings. Regional planners have investigated solutions to existing bottlenecks at the I-5 connections with I-405 and I-84. ODOT is responsible for conducting ongoing studies to identify other congestion problems on I-5 in Oregon that may need to be addressed in the future.

Hines, Maurice

From: Doug Mabry [doug@mabry.org]
Sent: Monday, October 24, 2011 9:48 PM
To: Columbia River Crossing
Subject: feedback

P-059-001 How will businesses be re-imbursed for lost revenue during the building project?

P-059-001

Businesses will not be reimbursed for lost revenues, but any business that would be directly displaced would be provided with financial and other relocation assistance. The project will also work with businesses located near construction to support their continued viability. This is discussed in the FEIS, Section 3.4.

Hines, Maurice

From: Doug Mabry [doug@mabry.org]
Sent: Monday, October 24, 2011 9:50 PM
To: Columbia River Crossing
Subject: feedback

P-059-002 What is the impact of repairing the existing structure so it will last for another 50 years?

1

P-059-002

As documented in the Panel Assessment of Interstate Bridges Seismic Vulnerabilities Technical Report (2006), it was determined necessary for any CRC project alternatives that reused the existing I-5 bridges to also seismically retrofit those bridges. The DEIS analyzed a Supplemental River Crossing as a component of two out of the five alternatives studied.

A Supplemental River Crossing, which would retain and seismically retrofit the existing bridges for northbound traffic and add one new bridge to the west for southbound traffic, was not chosen as a part of the Locally Preferred Alternative by the local sponsor agencies. This decision was informed by the DEIS, which found, among other things, that the Supplemental River Crossing would not substantially improve congestion over No-Build, would maintain some substandard and unsafe design features, and would not be substantially cheaper to construct than a replacement river crossing, as originally believed. In addition, the Supplemental crossing could worsen marine navigation by retaining the existing piers, and adding a new set of structures in the water with the new bridge. The US Coast Guard informed the project in a letter dated January 26, 2006, that “retention of one of the existing bridges for travel off Interstate 5 would at best maintain the same degree of difficulty to vessels, especially downbound tows. For that reason I would also not recommend such a plan…”

Although the Supplemental River Crossing would improve the seismic safety of the existing bridges, these findings indicate that it did not meet the project's Purpose and Need as effectively as the Replacement River Crossing. A supplemental bridge that only includes improvements for transit and/or bicycles and pedestrians also does not meet the CRC project's Purpose and Need. As described in Chapter 1 of the DEIS, the project's Purpose and Need "was developed by relying on previous

planning studies, solicitation of public input, and coordination with stakeholder groups."

Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 7:44 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 1

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem
To: feedback@columbiarivercrossing.org
Unanswered excessive cost issue

P-060-001

Please do not approve this project. Here is one fundamental reason why it should be rejected:

In February John **Mica**, chairman of the House **Transportation** and Infrastructure Committee, at a "listening session" in Vancouver Washington. During that meeting, he held up a graph that David Madore passed to him that showed the cost of the CRC Light Rail project as extreme compared to the other recent bridge projects in the country. He asked everyone in the room why this project was off the chart in extreme expense compared to the others. He that it appeared that something was fundamentally wrong with this project that question needed to be answered.

After Mr. Mica returned to Washington, he then praised the project as though he had forgotten the red flag that indicted something was very wrong with the cost. There is no record of the excessive cost being addressed or justified. That is a problem. Such a fundamental red flag should have caused a pause in this project and a clear investigation conducted to determine the source of the anomaly. The NEPA process was not followed because other more practical less costly alternatives were not considered to resolve the prohibitively high cost.

It would be irresponsible to move forward with this project with such a glaring red flag.

Please acknowledge receipt of this letter to:

David Madore
david.m@usdigital
1400 NE 136 Ave
Vancouver, WA 98684
cell: 360-601-3056

P-060-001

Although project expenditures are appropriate for a project of this type - complex, large, and inter-agency - the Project Directors and the leadership of Sponsoring Agencies are mindful of the project's costs, and are working to both reduce costs and find the necessary funding. Based on this comment, it appears that concerns Representative Mica may have had regarding the project were resolved. However, as Representative Mica has not submitted a comment on the FEIS, the project cannot make any definitive conclusions as to his perspective on the project.

Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 8:19 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 2
Attachments: CRC_Financial_Analysis_by_Impresa_Inc.pdf

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem 2
To: feedback@columbiarivercrossing.org
ODOT statements contradict fundamental CRC statements

P-061-001

Please do not approve this project. Here are several fundamental reasons why it should be rejected:

This project is based on a false information. The bridge that this project is to replace has been fallaciously deemed as unsafe when ODOT documentation declares the bridge to be in healthy condition and able to continue serving the public for another 60 years. During the last major upgrade to the existing I-5 Columbia River Bridge, ODOT published the following statements on their official website for the public:

"The two bridges have a full-time crew on deck to keep the aging structures in top operating condition. Only three other Oregon bridges -- all in Astoria -- have a designated maintenance crew.

This personalized care, combined with large maintenance projects, has kept the spans healthy and free of weight restrictions. With ongoing preservation, the bridges can serve the public for another 60 years.

The Interstate Bridges continue to be a vital link between Portland and Vancouver and complement any long-range plans to manage and improve transportation in the I-5 corridor between the two states.

Maintenance and repairs keep the bridges healthy and free of weight restrictions. Some recent bridge preservation efforts have included:
- 1987-90 - Replacement of the lift-cables, drums, expansion joints and deck pavement overlay ($3 million)
- 1995 - Replacement of diesel generator and lift-engine ($120,000)
- 1997 - Replacement of an axle-like steel trunnion, counterweight sheaves and steel ropes ($3 million)
- 1999-2001 - Painting, sub-deck and steel rehabilitation on the northbound bridge ($20 million)

The current project will upgrade and replace significant portions of the electrical systems within the two spans. Transportation funding experts estimate a replacement bridge would cost between $500 million and $1 billion."

P-061-001

The safety needs for these bridges are in relation to traffic safety and seismic safety, as described in Section 1.3.2 of the FEIS. Also see the discussion of seismic safety on page 6-22 of the FEIS. The safety aspect Mr. Madore is referring to is structural integrity. The bridges have adequate structural integrity and are not in danger of any immediate failure, except in the case of a major seismic event.

The estimated cost for the replacement bridges over the Columbia River is within the range noted. The total CRC cost includes much more than the two Columbia River bridges, as described in Chapter 4 of the FEIS.

P-061-001

Notice also that ODOT stated that "Transportation funding experts estimate a replacement bridge would cost between $500 million and $1 billion." Yet the CRC Light Rail project is now stated to cost 4 to 7 times the cost that the experts stated at the time. Prices of materials and services have not grown to explain the inflated costs that the CRC now estimates. Note that the Cortright Report (attached) shows the actual cost of the CRC plan to be $8.7 billion with finance charges. A copy of that report is attached. It shows numerous problems that have not been addressed by the NEPA process.

It would be irresponsible to move forward with this project with such a glaring red flags.

Please acknowledge receipt of this letter to:

David Madore
david.m@usdigital
1400 NE 136 Ave
Vancouver, WA 98684
cell: 360-601-3056

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plaid pantry
convenience stores
Plaid Pantries, Inc. - 10025 SW Allen Blvd. - Beaverton, Oregon 97005 - Telephone: 503.646.4246 - Facsimile: 503.646.3071

MEMORANDUM

TO: Senator Peter Courtney, President of the Senate
Senator Richard Devlin, Senate Majority Leader
Senator Ted Ferrioli, Senate Minority Leader
Representative Dave Hunt, Speaker of the House
Representative Mary Nolan, House Majority Leader
Representative Bruce Hanna, House Minority Leader
Members Oregon Legislative Assembly

COPY: Mr. Ted Wheeler, Oregon State Treasurer
Columbia River Crossing Project Sponsors Council

FROM: Chris Girard, President & CEO, Plaid Pantries, Inc.

DATE: October 4, 2010

RE: Columbia River Crossing

Ladies & Gentlemen:

P-061-001 Enclosed is a professional analysis of the economics of the current proposed Columbia River Crossing Bridge Project. I commissioned this study, and as a small business operator, I am respectfully requesting that you invest the time to read and understand the information in this analysis. It is not just about the proposed Columbia River Crossing (CRC) itself, but the likely negative impacts for Oregon's overall finances, taxpayers, and businesses, especially small business.

The report documents the unfortunate fact that the proposed CRC project's real costs are more than double the widely-accepted figure of $3.6 billion. In reality the current design for the project will cost in the range of $8 billion to $10 billion, or more, and there is no available source of revenue to pay for it. The financing plan is a guess at best, and the revenue projections are significantly flawed with bad assumptions and unacceptable risk at every step. The numbers and analysis underpinning this project simply do not add up to a happy ending.

This report also includes new analysis relating to the Governors' Independent Review Panel Report. The realities of our situation demand additional critical analysis before we proceed past a point of no return. There is a very real danger that we will create an irreversible multi-generational financial disaster. The current proposal is a "debt-bomb" that blows up well after all the consultants, planners, and engineers have moved on to their next projects. Only the State and its taxpayers will be saddled with the ultimate responsibility, creating serious implications for Oregon's overall finances, small businesses, our customers, and all Oregon taxpayers.

P-061-001

There is no doubt that we need to address the congestion on the I-5 system, and the ultimate solution probably involves one or more new river crossings. But the plan must be realistic, affordable, financially sound, and phased to allow for financing contingencies. The current CRC proposal fails these criteria in every respect.

I initially became involved with the CRC Project due to potential impacts on three of our company's stores. As I learned more about the project, and realized the full scope and costs of this mega-project, I developed a broader concern because the economic analysis seemed flawed. In particular I began to doubt that we could pay for it. My research led me to others who shared my concerns, including Mr. Joseph Cortright of Impresa, Inc., who had conducted an earlier analysis of the project. Mr. Cortright is a widely-published leading economic analyst, an expert in regional economic analysis and development, and a Nonresident Senior Fellow at the Brookings Institution. I retained Mr. Cortright to update and expand on his earlier work, and the attached report is the result.

Please take the time to understand this report, and I urge you to take whatever action is within your power to help ensure that we avoid a very big mistake. We need to come up with an affordable, responsible, and buildable solution that works for Oregon and its taxpayers, especially small businesses, and all stakeholders who depend on a well-functioning I-5 system.

Respectfully Submitted,



William C. (Chris) Girard, Jr.
President & CEO
Plaid Pantries, Inc.
503-526-8300
chrisg@plaidpantry.com

IMPRESA
ECONOMICS

Financial Analysis of the Columbia River Crossing

Joseph Cortright,
Impresa, Inc.,
October 2010

Prepared for Plaid Pantries, Inc.

Executive Summary

P-061-002

This report analyzes the forecast accuracy, financial costs, and financial risks associated with the proposed Columbia River Crossing Project. It reaches three principal conclusions: 1) the traffic forecasts on which project finances are based are inaccurate and unreliable; 2) the thirty-year cost of building and operating the CRC will be at least double the $4 billion estimated and could reach $10 billion or more; 3) the project will necessitate a huge increase in bonded public debt and poses substantial additional financial risks including mega-project cost overruns.

1. CRC traffic forecasts are inaccurate.

CRC forecasts grossly over-estimate the traffic growth on the I-5 Columbia River Crossing. These forecasts are critical because they provide both the justification for the sizing of the project (number of lanes and size of interchanges), and because they underpin the financing of the project through toll backed bonds.

The CRC forecasts that traffic over I-5 will grow at an average of 1.3 percent per year from 2005 to 2030, from 135,000 vehicles per day in 2005 to 184,000 vehicles per day in 2030. But in fact, traffic on the I-5 bridges has declined every year after 2005.

Traffic levels in the nearly five years since CRC forecasts were completed have declined by about 7,000 vehicles per day, rather than increasing by about 7,000 vehicles per day as forecast by the CRC. In the five years prior to the CRC forecast (1999-2004) traffic increased on the bridges at only about 0.6 percent annually. The CRC forecasts assumed that traffic growth on the I-5 crossing would accelerate from 0.6 percent annually to 1.3 percent annually. But instead of growing at an accelerating rate, the volume of traffic crossing the bridges has declined every year after 2005, and the traffic growth rate has been decelerating systematically over the past 15 years.

The effects of this forecasting error are significant. In order to reach the 2030 predicted level of traffic in the no-build scenario, traffic growth rates would have to reverse their current decline and then accelerate to 1.8 percent per annum for the next 20 years.

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Portland, OR 97212
503.213.4443
www.impresaconsulting.com

P-061-002

The October 2010 letter from Mr. Cortright attached to Mr. Madore's comment letter was originally sent as an attachment to an October 2010 letter from Mr. Chris Gerard to members of the Oregon legislature. A response to those comments was provided in a January 21, 2011, letter from the ODOT Director to Oregon legislature members. The response letter addresses and refutes the inaccuracies in Mr. Cortright's letter. The response letter is available on the CRC website at: http://www.columbiarivercrossing.org/FileLibrary/Memorandums/PlaidPantry_Response.pdf

P-061-002

CRC forecasts are flawed for a variety of reasons. Most importantly, they are outdated (based on 2005 estimates and a 1994 survey of travel behavior), they use estimates for the value of time that are inaccurate, thereby systematically underestimating likely diversion in the face of tolls. In addition, the estimates contain errors of arithmetic calculation, and were "post-processed"--a euphemism for CRC planners substituting their judgment about appropriate values in place of model outputs to produce higher levels of traffic on the I-5 crossing. The result of this one change was to raise forecast traffic (and associated toll revenues) 6 percent above those produced by unaltered Metro model results.

The inaccuracy of these traffic forecasts casts serious doubt on the findings contained in the environmental impact analysis, because these forecast traffic levels are used as the baseline for calculating the net environmental impacts of build alternatives. Inaccurate traffic forecasts also cast doubt on the financial analysis. If the bridge has less traffic than forecast, toll bonds will not produce the projected levels of revenue, and the project will experience significant revenue shortfalls that could produce bond defaults or require additional state subsidies. The overestimates also mean that both the DEIS traffic analysis and the URS traffic analysis (which uses the same forecast volumes) are leading to an oversized facility relative to likely demand.

2. Total 30-year CRC costs will total nearly $10 billion.

The total 30-year cost of the Columbia River Crossing is likely to approach $10 billion (measured in year of expenditure dollars). In addition to the construction cost of the project, currently estimated at upwards of $3.9 billion, the project will necessitate additional expenditures over the next 30 years estimated as follows:

$3,875 million in construction costs, plus:

$2,700 million in interest payments,
$1,700 million in toll collection costs,
$1,300 million in supplemental project costs,
$ 275 million credit card, sales tax and bond issuance costs
$ 175 million incremental transit operating costs

$10,025 million total 30-year cost

Because the financing for the project requires borrowing in advance of the receipt of federal, state and toll revenues, the CRC will have to borrow money to pay interest while the project is being constructed, and will effectively have to pay interest on top of interest. The scale of the project imposes major opportunity costs on the region—the loss of benefits from other projects that could be financed with this stream of revenue. In addition, because the region's commuters will be paying additional costs, through tolls and taxes to pay for the project, this will reduce consumer income available for spending in the local economy, resulting in a loss of jobs and tax revenues for state and local governments.

IMPRESA

3. The CRC poses major financial risks

P-061-002

The Columbia River Crossing poses a major financial risk to transportation finance in the Portland metropolitan area, and to the state. For this type of project, there is a very high likelihood of cost overruns. The multi-billion dollar scale of the CRC qualifies it as a "mega-project." Given the history of similar scale projects, both nationally and internationally, the likelihood of cost overruns is on the order of 90 percent. Cost escalation for the two most recent large scale projects undertaken by ODOT exceed 200 percent from the DEIS stage (the current stage of the CRC) to current estimated completion cost. While responsibility for cost overruns has not been established, it is likely that these costs would have to be borne by Oregon and Washington, and could be on the order of additional hundreds of millions to billions of dollars. Once construction is commenced, there would be few ways to mitigate or reduce these risks.

The Independent Review Panel criticized cost estimates for the project, observing that the estimates were based on a now discarded design and that they don't address key risks. The panel labeled the cost estimates "problematic" and warned that unless corrected, they would have a "dramatic effect" on the ability of the project to obtain funding.

There is also a considerable risk associated with traffic and toll projections, which have regularly proved to be over-optimistic in practice. The CRC assumes that even with tolling, traffic on I-5 will increase dramatically faster than it has for the past decade. The project's debt service payments are "back-loaded" meaning that the project pays a higher and higher payment each year. As a result, the ability to pay for the project is highly dependent on a sustained high level of traffic growth and regular toll increases. If traffic growth is only half as fast as forecast—for example, 0.8 percent per year during the 2020s, compared to the 1.75 percent increase forecast by the CRC—the project would experience a $1 billion shortfall in net revenues available to pay debt service. There are interest rate risks as well; although current borrowing rates are relatively low, they may increase substantially when bonds are actually issued, three to five years from now.

There are major risks to accomplishing the Columbia River Crossing project according to the schedule proposed by project sponsors. Delay is significant because it is likely to increase the total cost of the project, both due to inflation in the cost of materials and labor, but also due to the interest cost associated with a longer construction period. Special factors—like the need to time in-water construction to avoid salmon migration—can have the effect of magnifying the impact of even minor schedule delays.

The Columbia River Crossing runs the real risk of a financial collapse because it relies on over-optimistic traffic and revenue projections, and downplays the real risks of cost overruns, revenue shortfalls and project delays. There is a significant likelihood of concurrent problems resulting in a situation in which project costs exceed the amounts now estimated, federal and state contributions are less than hoped, and traffic volumes are dramatically less than forecast. Because such a significant portion of the cost of the bridge must be borrowed, these fiscal shortfalls would lead to a cascade of events: the project would deplete borrowed project reserves and would be forced to further increase tolls, which is likely to have the effect of driving traffic levels lower. When reserves are exhausted bond covenants would likely require that the two states make good on any toll revenue shortfalls, either by diverting money from other projects or raising taxes.

IMPRESA

P-061-002

This report was prepared by Impresa, Inc., based on documents obtained from the Columbia River Crossing, and other pertinent information identified in the reference section of this document. Analyzing the financial status of the project is complicated because the CRC is behind schedule in completing important financial planning tasks, and because it has provided some key documents only in response to formal public records requests. We have relied on several documents obtained through a public records request filed by the Pacific Environmental Advocacy Center. Among other things, these documents identify the dollar amount of total interest costs, toll collection costs and pay by plate surcharges that are revealed nowhere in the public presentations of project costs by the CRC. While the project's official schedule (dated November 30, 2009) called for several key financial documents, including a Financial Plan, Financial Risk Analysis and State Funding Documents to be completed in January and February of 2010, we were told by project officials in July that copies of these documents could not be produced because they had not been completed. The fact that significant portions of project costs have been largely unavailable for public review, and key financial planning documents remain incomplete underscores the concerns raised in this report about the level of risk and uncertainty surrounding this project.

1. CRC Traffic Forecasts Are Inaccurate.

P-061-003

Both the need for the CRC and the financing plans for the CRC depend directly on the accuracy of the traffic forecasts for the I-5 river crossing. The Draft Environmental Impact Statement projects that between 2005 and 2030, traffic crossing the I-5 bridges would rise from about 130,000 vehicles per day to 184,000 vehicles per day. If these traffic forecasts are incorrect, then there would be less need for the capacity provided by the CRC, and the financial contribution estimated to be provided by tolls will not be realized. The CRC traffic projections are directly contradicted by recent trends in traffic in the I-5 corridor.

1.1 CRC traffic forecasts have already proven to be inaccurate

The base year for the forecasts of future traffic for the Columbia River Crossing is 2005. The CRC forecasts that traffic in the no-build scenario on the I-5 bridges will be 184,000 vehicles per day in 2030.

We now have nearly five years of experience—about 20 percent of the planning period--since the base year of the CRC traffic forecasts. How well have their estimates been born out by actual experience?

The Oregon and Washington Departments of Transportation collect data that track the average level of traffic volumes on I-5 across the Columbia River. These data are reported by the Southwest Washington Regional Transportation Council. Data are from the council website: http://www.rtc.wa.gov/data/traffic/brdgawd.asp "Columbia River Bridges." The following table shows average annual traffic over the I-5 Columbia River Bridges for the past 15 years. It also displays the annual growth rate of traffic each year, compared to the preceding year, and the average annual growth rate for three five-year periods.

P-061-003

Please see responses to Joe Cortright's letter (P-047).

P-061-003

Average Daily Traffic, I-5 Bridges,

Year	Average Daily Traffic	Annual Growth Rate
1994	112,988	
1995	116,589	3.2%
1996	118,558	1.7%
1997	120,644	1.8%
1998	124,516	3.2%
1999	126,589	1.7%
2000	126,903	0.2%
2001	125,652	-1.0%
2002	128,162	2.0%
2003	129,657	1.2%
2004	130,279	0.5%
2005	132,603	1.8%
2006	131,916	-0.5%
2007	130,389	-1.2%
2008	126,278	-3.2%
2009	125,436	-0.7%
Annual Average Growth (Five-year Periods)		
1994-1999		2.3%
1999-2004		0.6%
2004-2009		-0.8%

This data shows several key trends. First, for the past four years, average traffic levels on the I-5 bridges have been declining, not increasing. Second, the growth rate in traffic on the I-5 bridges has been decelerating for the entire period shown in this table. Growth rates averaged 2.3 percent per year during the late 1990s, only 0.6 percent per year in the next five year period through 2004, and traffic decreased at an average rate of 0.8 percent per year for the past five years. Third, the slowdown in traffic growth rates and the annual decline in traffic clearly preceded the recession that began in December 2007.

It is apparent that the baseline forecast for growth of I-5 traffic included in the Draft Environmental Impact Statement assumed a very dramatic acceleration in traffic growth from historical trends. To grow from a 2005 level estimated at 134,000 to a projected 2030 level of 184,000 in the DEIS base case, I-5 traffic would need to increase 1.3 percent per year over the 25-year period, 2005 to 2030. That would require more than doubling the rate of growth actually observed in the 1999-2004 period (0.6 percent). And as illustrated above, the historical data show that the rate of traffic increase has been decelerating (and now declining) and not increasing, as forecast in the DEIS. The DEIS and the traffic projections offer no explanation as to why the rate of increase of traffic should more than double from this long term trend.

Figure 1 shows the actual level of traffic reported by the Regional Planning Council (from the table above), and the forecast level of traffic growth required to achieve the 2030 projection of 184,000 vehicles per day. The actual level of traffic recorded in 2009 was roughly 14,000 vehicles less than the more than 140,000 vehicles per day implied by the

IMPRESA

P-061-003

CRC traffic forecasts. Whereas the CRC forecast implied that traffic over the I-5 bridges (in the no build scenario) would increase by almost 7,000 vehicles per day; in reality, the number of vehicles crossing the bridge declined by 7,000.

Figure 1: I-5 Bridge Traffic: Actual v. Predicted

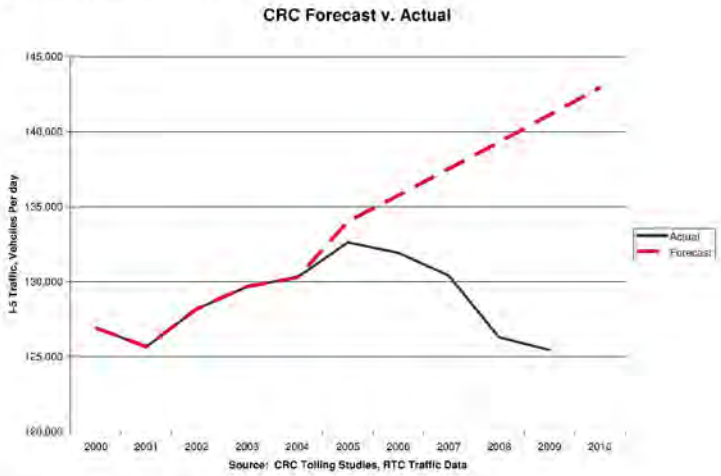
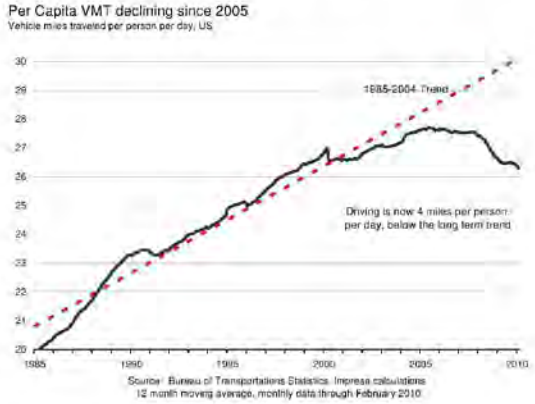


Figure 2: National Trends in Vehicle Miles Traveled



IMPRESA

P-061-003

As Figure 2 makes clear, travel demand estimates based on pre-2005 trends are very likely to overestimate travel demand growth. Following the big increase in gas prices after 2004, American citizens began driving less. That trend has persisted over the past five years.

It might be argued that the past four years of declining traffic are a temporary aberration, and that in the longer term, forecast growth will make up for these declines. This is unlikely to be true for three reasons. First, as noted above, the trend has been for a decelerating rate of growth over the past 15 years. Second, as discussed below, changes in gas prices and consumer behavior that are very long term in nature are behind the decline in CRC traffic. And third, the departure from forecast experienced so far means it is likely impossible to make up the shortfall over the remaining time in the forecast period. In order to reach the expected No-Build 2030 traffic volumes of 184,000 from the actual 2009 level of traffic, traffic would have to increase by 1.85 percent per year for each of the next 20 years. That is a growth rate about forty percent faster than the 1.30 percent forecast in the DEIS, and two and a half times faster than the 0.7 percent growth rate actually observed over the fifteen year period 1994 to 2009. The CRC project materials provide no basis for believing such a dramatic increase in driving will occur.

The tendency to overestimate future traffic levels in mature travel corridors is also apparently an endemic problem with the current methodology used to predict future transportation demand. After a careful review of the literature, the Government Accountability Office found:

> . . . current travel demand models tend to predict unreasonably bad conditions in the absence of a proposed highway or transit investment. Travel forecasting, as previously discussed, does not contend well with land-use changes or effects on nearby roads or other transportation alternatives that result from transportation improvements or growing congestion. Before conditions get as bad as they are forecasted, people make other changes, such as residence or employment changes to avoid the excessive travel costs.
> (Government Accountability Office, 2005)

The weakness of transportation models in accurately predicting future traffic levels is a continuing problem. So it is not merely the CRC traffic projection model that is problematic; rather the entire class of four-step models (trip generation, assignment, mode, routing) have proved inaccurate in practice. After an exhaustive review of the state of the art, the Transportation Research Board of the National Academies wrote:

> "In 2005, as has been true for the past four decades, these models could not provide accurate information to inform decision making on many transportation and land use policies or traffic operation projects."
> (Committee for Determination of the State of the Practice in Metropolitan Area Travel Forecasting, 2007)

P-061-003

While technology has allowed for faster computation, and more detailed mapping, they conclude:

> "The practice of metropolitan travel forecasting has been resistant to fundamental change. Every 10 years or so there begins a cycle of research, innovation, resolve to put innovation into practice, and eventual failure to affect any appreciable change in how travel forecasting is practiced."
> (Committee for Determination of the State of the Practice in Metropolitan Area Travel Forecasting, 2007) pages 123-124.

As a result of over-forecasting, the size of the CRC may be much larger than needed. Traffic volumes are falling, even without tolls. If the I-5 crossing were tolled, many fewer vehicles would cross, depressing traffic levels still further and revenue would be correspondingly less than forecast.

The no-build scenario serves as the base case for evaluating all of the other alternatives—to the extent that the no-build scenario is flawed, the traffic estimates for the build alternatives are also similarly flawed.

Even the traffic analysis by URS, which served as the basis for a recommendation to reduce the bridge from 12 through lanes to 10, is predicated on the flawed DEIS forecasts. A more accurate forecast of future travel volumes would indicate that much less capacity is needed over the Columbia River.

1.2 CRC traffic forecasts do not account for higher gas prices

CRC traffic forecasts appear to be badly out of date, and there is no evidence that they have been adjusted to deal with current gasoline prices or development trends. The CRC traffic forecasts are poorly documented, and don't indicate what baseline data were used, what assumptions were made, and what error and uncertainty factors are associated with these estimates. It appears from the documents included in the Draft Environmental Impact Statement that traffic projections were made in 2007, based on 2005 data. The key measures of traffic activity (184,000 crossings of the I-5 bridge in the no-build, and 178,000 in the build alternatives), have remained essentially unchanged for several years. (See for example, Draft Environmental Impact Statement, Summary, Exhibit 26 Summary of Transportation Effects and Cost for Each Alternative, Page S-30). The forecast documents, including those released in 2010, use the same numbers (184,000 in the no-build, and 181,000 for the LPA) as the project has publicly quoted since the DEIS was released in 2008. The forecast documents refer to the "current year" for traffic purposes as "2005." The modeling was based on Metro's transportation model (Columbia River Crossing, 2010f). The Metro model was calibrated based on behavioral data collected in 1994 and assumes that real gasoline prices would not increase at all, i.e. that gasoline prices increase no faster than the rate of inflation (Higgins, 2008).

P-061-003

There is clear evidence that the persistently much higher level of gas prices since 2005 has produced a sea change in consumer behavior. Nationally, per capita driving has been in decline since 2004, and is now at 1999 levels. (See Figure 2 on page 6.)

Consumers are not only driving less, but are scrapping cars faster than they are buying new ones. Nationally, the number of vehicles in operation declined by four million in 2009 (Brown, 2010). In Oregon, vehicle registrations have declined by 30,000 compared to the previous year (Har, 2010).

The rise in gasoline prices and a growing interest in alternatives to car-dependent living has triggered a shift in housing markets within metropolitan areas. The biggest price decreases in housing and the highest foreclosure and default rates have been recorded in outlying suburban locations (Cortright, 2008).

The CRC's transportation model is based on observations made in 2005, and assumes the consumers will continue to behave as they did in 1994 (when gasoline cost $1.10 gallon). As a result CRC predicts the rate of increase of vehicle travel will be double that of the previous decade. This is highly suspect in a world where gasoline prices have more than doubled, where driving is in decline, and consumer behavior patterns are obviously changing.

1.3 CRC traffic forecasts are outdated

The traffic forecasts used to justify the need for the project, estimate its environmental impacts, and develop its financial plan appear to be significantly outdated.

The materials documenting these forecasts do not clearly reveal the dates on which they were prepared, or the vintage of the data used to estimate key variables. The base year for the forecasts in the DEIS and in subsequent financial planning documents is 2005. It is apparent that the toll revenue forecasts relied on the same forecasts shown in the DEIS, i.e. total levels of traffic in the no-build scenarios match the forecasts in the DEIS, exactly: 184,000 vehicles per day in the no-build replacement bridge scenario. Data for 2010: Traffic Effects for Tolling Scenarios, (Columbia River Crossing, 2010f); data for 2008: Traffic Technical Report, Exhibit 4-1 (Columbia River Crossing, 2008b). The traffic technical report is dated January 2008, and the text of the report indicates that many technical reports were completed in "late 2007." Again, this report describes 2005 as the "current year" for traffic comparison purposes.

Neither the DEIS, the traffic technical report to the DEIS, or the subsequent documents available for this review indicate the year in which traffic forecasts for the project were undertaken. It appears from these documents that the forecasts were made in 2006, using a base year of 2005. The forecasts also appear to rely on a Metro regional transportation model that was calibrated based on the household travel survey conducted in 1994 .

P-061-003

1.4 CRC forecasts inflated I-5 traffic estimates using "post processing"

While the CRC traffic forecasts based their initial estimates on the regional transportation model, they adjusted these estimates to shift some forecast traffic from I-205 to I-5. The authors of the study labeled this manual adjustment "post-processing"—but it simply means that they used their own judgment to select higher values for I-5 than those produced by the regional transportation model. The reasonableness of this adjustment is debatable. The CRC claims that an analysis of 2005 actual traffic data shows that actual traffic on I-5 was underestimated, relative to I-205 by the regional model. The authors made no apparent attempt to see if their adjustment was supported by data in any subsequent year. But each year after 2005, traffic volumes have been proportionately higher on I-205 than I-5, undercutting the stated basis for this "post-processing" adjustment.

According to the report, the effect of the "post-processing" adjustment was to increase traffic volumes assigned to the I-5 bridges by 6 percent over the levels predicted by the regional transportation model without this modification.

The report concedes:

> However, the post processing methodology forecasts less traffic diversion from I-5 to I-205; forecasted 2030 average weekday volumes on the I-5 Bridge are about 6 percent higher with the post-processing methodology than with the regional travel demand models.
> (Columbia River Crossing, 2010b).

The effect of this adjustment is to understate the amount of diversion that will occur to I-205, even with the relatively high value of time estimates used in the travel demand model.

Despite its technical sounding name "post-processing" really represents a judgment on the part of the CRC to disregard the outputs of the Metro travel demand model, and to manually choose the values for traffic.

1.5 CRC forecasts over-estimate the value of travel time, under-estimating toll diversion, and over-estimating revenues

The toll revenue forecasts estimate traveler response to tolls by estimating the value that travelers attach to time savings, and then translating the cost of tolls into a time equivalent penalty. For example, the toll study estimates that travelers value their time at about $18.89 per hour, meaning that a toll of $2.00 has the same effect on travel behavior as a 6 minute delay. (Here's the math: at $18.89 per hour, each minute saved is worth about 31 cents. At this rate, two dollars would be equal to about 6.3 minutes of time). Since travel models are used to predict traveler behavior based on travel time between

P-061-003

points, these delay values can then be incorporated into travel demand models and used to predict changes in travel behavior.

Use of a single amount for the value of time for all commuters is inappropriate and underestimates the effect of tolls especially on lower income households. At least 7,000 Clark County residents who commute to Oregon, according to the Census Bureau, earn less than $1,250 per month at their primary job. Most of these persons earn $10 per hour or less. The transportation literature suggests that most such workers value travel time at one-half their wage rate. For these low paid workers, their value of travel time is likely to be $5 per hour (or less) and not $19 per hour. Consequently, tolls are much more likely to reduce commuting (and Oregon job holding) by lower income residents. This is not analyzed in the financial projections or the DEIS.

This shortcoming has both financial and equity considerations. For lower income travelers (and those who place a lower value on their time), the toll has a much larger impact on travel behavior. For travelers who value their time at $5 per hour, a toll of $2.50 is the equivalent of 30 minutes delay in terms of shaping travel behavior. The CRC analysis assumes that all travelers treat the toll as having a six minute time penalty.

The estimate of $18.89 per hour as the value of time for all commuters is shown in *Description of Revised Toll Model and Traffic and Gross Revenue Projections for Tolling Scenarios* (Columbia River Crossing, 2010b).

> Two different VOTs, peak and off-peak, were assumed for passenger cars in the Metro modeling:
> Peak periods (AM and PM): $18.89 (2009 $) which equates to $13.33 (1994 $)
> Off-Peak periods: $12.57 (2009 $) which equates to $10.38 (1994 $)

Value of time estimates are a critical part of tolling assumptions. Independent analysts of toll revenue forecasts routinely call for a deep discount to value of time estimates in evaluating the credit-worthiness of toll forecast estimates. Fitch's criteria for stress testing toll revenue forecasts call for re-computing revenue estimates after reducing the estimated value of time 50 percent to 75 percent (Seattle-Northwest Securities Corporation & Montague DeRose and Associates, 2007). Such a stress test is an integral part of preparing what is referred to as an "investment grade" revenue forecast. In the case of the Columbia River Crossing, this would require reducing the value of time to between $4.72 and $9.45 for peak hours and $3.33 and $6.67 for non-peak hours.

The Independent Review Panel noted that an investment grade analysis has not been undertaken, and that one will be required:

> It is clear that if tolling is to be part of the investment package, where tolls are the source for paying back revenue bonds, an investment grade analysis will have to be conducted. Such an analysis will have to be at a much higher level of specificity, for example, knowing what the tolling schedule will be. This investment grade analysis will include another travel demand analysis, most likely requiring a more up-to-date database upon which to calibrate the model. Project financiers typically

P-061-003

> will only accept as investment-grade quality work that is performed by certain entities who typically have proven experience in conducting such studies. Independent Review Panel 2010, page 176.

Using a lower value of time has a direct effect on the traffic and toll revenue estimates prepared for the Columbia River Crossing. A lower value of time would mean fewer trips over the I-5 bridge and more diversion to alternative routes, especially in the event that the I-205 bridge is not tolled. It would also mean that the I-5 bridge tolls would produce lower levels of revenue.

In addition to the problems in the estimation of travel times overall, and for low income travelers, there is also an obvious math error in the computation of the inflation-adjusted value of time. The value of time calculations are adjusted to different year's dollars based on two different indices: at least one is in error. On pages 3-1 through 3-3, the report claims that a wage of $18.86 in 2009 dollars is worth $10.38 in 1994 dollars and that a wage of $12.57 2009 dollars, is worth $10.38 in 1994 dollars. The first calculation implies a 1994 dollar is equal to .71 2009 dollars, the second implies a 1994 dollar is equal to .83 2009 dollars. One must be wrong.

1.6 Inaccurate toll forecasts threaten CRC financial viability

Traffic forecasts underpin both the rationale for building a larger capacity crossing over the Columbia River and the financial plan for paying for the project. If traffic levels are less than forecast, as is already apparent, then a key part of the plan for financing the project is compromised.

The CRC toll bonds are planned to have a highly back-loaded amortization schedule (Columbia River Crossing, 2010c). This means repayment depends heavily on sustained annual increases in traffic and regular toll increases. If traffic levels do not increase as fast as projected, it would trigger a significant revenue shortfall. To calculate the sensitivity of toll revenue estimates we modified the CRC forecasts to assume a 50 percent lower rate of traffic growth than that used by CRC. (From 2020 to 2030, CRC assumes that traffic will increase about 1.75 percent each year, and 1.0 percent thereafter). We examined the effect of annual increases of half that amount, starting from the opening year (2018) estimate used by CRC. Reducing the growth rate (in the 2020's, for example to 0.875 percent per year), has the effect, over the 30-year life of the bonds, of reducing gross toll revenue by about $1.24 billion, and reducing net toll revenue (the amount available after collection costs available to make debt service payments), by slightly more than $1 billion.

This is not merely a theoretical problem. Predicting net revenues for tolled facilities, especially when there is no recent history of tolling in the area, is even more difficult than predicting future traffic volumes. Experience in Washington State shows that faulty forecasts can easily and quickly produce revenue difficulties for toll bridges. In 2007, WashDOT completed a second Tacoma Narrows bridge, and imposed tolls to finance the

P-061-003

cost of construction. In 2007, just prior to opening the Tacoma Narrows Bridge, WSDOT forecast that revenues in FY 2010 would be $62,937,827 (Washington State Department of Transportation, 2008). In a more recent forecast, updated through April, 2010, however, WSDOT forecast that FY 2010 revenues would be about 25 percent less, $45,207,519 (Washington State Department of Transportation, 2010a). The toll revenue shortfall was a result of lower than anticipated traffic and slower than anticipated increases in toll levels. Political opposition to higher tolls prompted the state to defer the toll increases that were assumed in the project's original financial plan.

One way forecasters attempt to deal with uncertainty is to develop alternative scenarios. The CRC has failed to undertake any serious sensitivity or alternatives analysis. They applied a "15 percent bandwidth" to their estimates, i.e. computing the effect of a 15 percent smaller volume of traffic and a 15 percent higher volume of traffic than called for in their forecast. They provide no basis for assuming a 15 percent error factor is sufficient. It is already the case, as illustrated in Figure 1 that the forecast for the year 2010 has an error of more than 10 percent in total traffic volumes in just four years. And, as indicated above, the Tacoma Narrows Bridge experienced a 25 percent shortfall in revenue from forecast over a period of just two years.

The CRC financial plans assume that the authority setting the tolls for the Columbia River Crossing is willing and able to increase tolls each year by at least the rate of inflation (assumed to be 2.5 percent per year). If the authority fails to increase tolls by this amount, or delays the increases, the project will experience a shortfall in revenue. Indeed, this has been a contributing factor to revenue shortfalls for the Tacoma Narrows project.

2. Total 30-year CRC Costs will total nearly $10 billion.

P-061-004

How much will the Columbia River Crossing project cost? Widely distributed public materials circulated by the Oregon and Washington Departments of Transportation state the project will cost between $2.6 billion and $3.6 billion . (See for example "Project Fact Sheet" (Columbia River Crossing, 2010d). That number is just the up-front construction cost and does not include the cost of financing, including interest, or the cost of operations, especially toll collection. Many of these costs will be incurred over a period of decades, rather than being paid "up-front." This memorandum compiles the additional costs not included in the construction-only cost estimate.

The actual cost of the Columbia River Crossing is difficult to portray because many of the costs will be paid over a number of years. To provide a fuller and more complete picture of project costs, we have developed a set of estimates of the 30-year costs associated with constructing and operating the Columbia River Crossing.

This task is further complicated because the financial plans for the Columbia River Crossing have not been fully worked out. Project sponsors are assuming that most of the money will come from state and local governments, and the remainder from toll-backed bonds. About $400 million would need to come from earmarked federal funds from a yet-to-be-enacted federal transportation bill, and related federal gas tax increase.

CRC documents show plans to borrow $1.3 billion over 30 years, to be repaid by future toll revenues. When we compute the total cost of the project over the next 30 years, the total price tag will more than double.

Thirty-Year Estimate of Columbia River Crossing Costs

Category	Thirty Year Cost, Millions, Year of Expenditure Dollars
Construction Cost	3,875
Interest Cost	2,700
Toll Collection Cost	1,700
Credit Card Cost	142
Sales Tax	117
Bond Issuance Cost	16
Transit Operating Cost	175
Added Project Costs	1,300
TOTAL	10,025

The $2,700 million is the interest (excluding principal repayment) over the 30-year life of the $1,300 million bonds; the $1,700 million is the cost of building and operating an electronic transponder and billing system to collect tolls. Credit card fees are what CRC will pay banks to process electronic payments. The bond issuance costs are the fees (and discount) the bankers will charge for preparing and issuing bonds.

IMPRESA

P-061-004

The cost of financing is not relevant to environmental and NEPA review. However, see the finance plan in Chapter 4 of the FEIS for related information. Also, for a response to the letter from Plaid Pantry expressing concerns regarding construction costs, traffic modeling, and financial risks, please see the January 21, 2011, letter from Matt Garrett, ODOT Director, to members of the Oregon legislature. That letter can be found on the CRC website at: http://columbiarivercrossing.com/FileLibrary/Memorandums/PlaidPantry

Also see the March 25, 2011, letter from Matt Garrett to Chris Gerard, President of Plaid Pantry, available from the project office.

In addition, see the responses to Mr. Cortright's FEIS comment letter (P-047) regarding traffic forecasting, financing and other related issues.

P-061-004

One technical note: These figures are in terms of year of expenditure dollars (i.e. not adjusted for future inflation). These amounts are taken directly from budget and amortization schedules that estimate these costs in the dollars of the year in which they will be spent.

Toll bonds might appear to some to be inexpensive up front, but roughly speaking, each $1 of the project financed by toll bonds results in an additional 30 year cost to bridge users of more than $3.00, about $2.00 for interest and about $1.00 for toll collection costs. In other words, bridge users will have to pay a total of $4.00 in tolls for each $1.00 of bridge construction costs that are financed by toll bonds.

2.1 Construction Cost

No one is certain how much the Columbia River Crossing will cost to build. There is still considerable debate over what form the project will take.

Publicly, the CRC promotional materials claim that the cost of constructing the Columbia River Crossing, as currently proposed, is between $2.6 billion and $3.6 billion (Columbia River Crossing, 2010d). Specifically, CRC states:

> Based on fall 2009 design refinements and additional engineering, construction is expected to cost $2.6 to $3.6 billion (in year of expenditure dollars). Funding is expected from federal and state sources and tolling.

These estimates are subject to considerable uncertainty and risk. The project scope may be changed—discussions are currently underway to dramatically alter the project's profile on Hayden Island—and there are a series of other sources of risk—described in Section 3. It is also clear from the wording of the fact sheet "construction is expected to cost $2.6 billion to $3.6 billion" that these numbers do not include costs for financing, collecting tolls, and operating the project.

However, the $3.6 billion cost estimate is based on a bridge design (closed-box segmental girder) that has now been discarded in favor of a double-decked open web design. The new design has not been subjected to a detailed Cost Estimate Validation Process. According to the Independent Review Panel, because the open web design has never been built at this scale, the cost could be much higher than the box girder design (Independent Review Panel, 2010).

According to materials presented to the Independent Review Panel, the project may cost as much as $3.877 billion. These estimates are based on the so-called 90 percent probability that costs will not exceed this amount and are for the "full" project. See Independent Review Panel, 2010, page 173. We adopt this figure as our baseline estimate of construction costs.

2.2 Interest Cost

Neither Oregon nor Washington have $3.9 billion on hand for this project, and as a result will have to borrow a significant portion of the funds needed to finance construction. Both states will incur significant interest and finance charges to borrow the money needed

P-061-004

to pay for the bridges. These interest and financing costs are not included in the CRC's estimate of a $2.6 to $3.6 billion price tag for the bridge.

This is disclosed in the report on toll financing:

> The use of toll bonds will increase the total costs paid during and after construction due to the added interest and issuance costs. However, these financing costs are treated separately from the project capital cost during construction.
> (Columbia River Crossing, 2010e)

The CRC's need for borrowing—and the attendant financing and interest costs—will be driven by the mismatch between the time it receives its revenue (from tolls and from federal and state sources) and when it needs to pay contractors who will build the project. The project will need to pay its construction costs prior to the time the bridge opens.

At a minimum, the CRC will pay interest on the bonds that are to be repaid from future toll revenues. It is also possible that the project will have to borrow additional money against future payments of state and/or federal revenues earmarked for the project. Project funding has not been approved by either state or by the federal government, and as a result, the payment schedule and amounts of funding to be provided from state and federal sources are unknown. It is likely that construction will commence before all projected federal and/or state revenues are in hand, so in order to finance construction it would be necessary for Oregon and Washington to issue bonds, and pay interest, in order to build the project. The Draft Environmental Impact Statement anticipates the possible use of so-called "GARVEE" bonds (grant anticipation revenue vehicle bonds). These bonds would enable the state to spend money now against anticipated future federal grants (Columbia River Crossing, 2008a). Oregon has also bonded money from vehicle registration fee increases in order to be able to accelerate timing of its bridge repair program. In all of these cases, the amounts paid in interest on bonds reduce the amount of money available to pay for transportation projects.

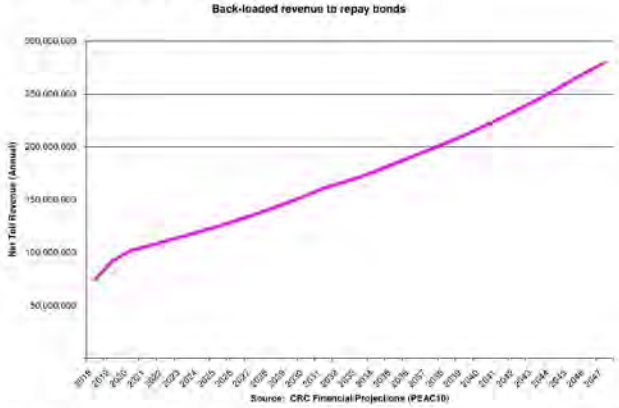
Our baseline estimate of interest costs is $2.7 billion, based on the project's own estimates of thirty-year interest payments on toll-backed bonds (Columbia River Crossing, 2010c).[1] This estimate is based on issuing $1.4 billion dollars of bonds, in three series. This high interest cost is the product of a complex financing structure. First, money has to be borrowed several years in advance of completion of the bridge, so the project has to borrow additional funds to cover "capitalized interest"—i.e. an additional $112.6 million to pay interest on the bonds during the period before toll revenues are expected to start flowing. Second, the amortization and payment schedule for the bonds is "back-loaded"—rather than having the same payment each year, the bond repayment amounts increase each year (based on the assumption that both traffic and toll rates will increase each year). Debt service payments start out (following bridge opening) in 2018

[1] The total amount of interest payments associated with toll-backed revenue bonds has not been disclosed in any publicly available reports issued by the Columbia River Crossing. These statistics were obtained from a report released in response to a public records request, and identified by CRC as PEAC-54.

P-061-004

at less than $60 million annually and escalate steadily to more than $250 million per year at the end of the repayment period in 2047.

Figure 3: Debt Repayment Schedule



The combination of carrying capitalized interest during construction and back-loading amortization dramatically increases the total amount of interest paid compared to the kind of garden variety borrowings with which most consumers are familiar. In effect, the CRC borrows money to make interest payments while the project is under construction, and ends up paying interest on top of interest. For example, if one could borrow $1.3 billion over 30 years, with a level repayment schedule (like a home mortgage) this would necessitate annual payments of about $93.5 million per year for a total of $2.8 billion in repayments over 30 years (30 * 93.5 = 2,805). Over the life of the bonds, $1.3 billion would be attributable to principal, and the remainder--$1.5 billion—represents interest costs. In rough terms, the additional interest associated with construction period financing and back-loading amortization works out to an added cost of $1.2 billion over the cost of a simplified mortgage like borrowing arrangement.

In addition, depending on the timing of payments from state and federal governments, the project could need to borrow larger sums to finance construction, and incur additional interest costs as a result. The CRC financial analysis assumes that federal and state contributions are available, in full, in the early years of project construction, and that issuance of toll-backed bonds (and accruing interest costs on these borrowings) can be postponed to later years.

> Toll bond proceeds are assumed to be received in the middle and latter years of construction to maximize their funding contribution, and other funding sources are assumed to cover construction costs in the initial years.
> (Columbia River Crossing, 2010e)

IMPRESA

P-061-004

If federal and state money is available later, or spread over a period of years (as is likely) this will further increase interest costs. In addition, the two states may issue bonds to finance their portions of the project costs against future revenues (such as gas taxes or vehicle registration fees), and these sources will also involve additional interest costs beyond those calculated here.

Interest costs could be considerably higher, and bond funding proceeds could be lower, for a variety of reasons. First, the interest rate charged on bonds could be higher than 6 percent, the amount assumed in the toll revenue analysis. The toll revenue analysis examined the effect of 7 percent interest, plus a higher level of debt service coverage, if the bonds were issued solely as revenue bonds, guaranteed by the tolls, with no state guarantee. In this case, the net amount of revenue likely to be lent declined by almost half. The non-recourse debt structures yield only between 50 percent and 55 percent of the amount yielded by state-backed debt (Columbia River Crossing, 2009b).

2.3 Toll Collection Cost

The CRC will need to build and operate a system for collecting tolls from bridge users. The CRC anticipates building a barrier-free tolling system. Most users would buy electronic transponders (small radio receiver/transmitters) that record travel across the bridge and bill users automatically. Those who didn't have a transponder would have their license plates photographed and would be billed through the mail using a system called "pay by plate." This system will require motorists to buy transponders, and for the states to build and operate a system for monitoring and billing transponder users, and for reading license plates, preparing and mailing bills, and collecting bills. All of these costs would be passed on to bridge users through the toll system. Transponder users would pay a standard toll rate (that would include the cost of operating the transponder system), and pay-by-plate users would pay the standard toll, plus a surcharge of $1.00 to 1.25 to cover the added costs associated with billing. The costs of operating this toll collection system are not included in the $2.6 to $3.6 billion construction cost of the CRC.

According to documents released by the CRC, the annual costs of operating the collection system would be $27 million in 2018 rising to $90 million in 2047 (Columbia River Crossing Toll Bond Program, Scenario 1 - Base (DEIS) Toll on I-5 Only: (Baseline (Post Processed) Forecast) State-Backed Bonds - 30 Year Term, (Columbia River Crossing, 2010c)). Over the first 30 years of project operation, the estimated total cost of operating the toll collection system would be $1,695 million. This is our baseline estimate of toll collection costs.

2.4 Bond Issuance Cost

The states of Oregon and Washington will have to issue bonds to raise the funds needed to pay for the construction of the CRC. In addition to the interest costs associated with repaying the bonds, the two states will have to pay financial and legal costs associated with bond issuance. According to documents released by the CRC, the costs of such

P-061-004

issuance are estimated at 0.8 percent of the face amount of bonds issued (Columbia River Crossing, 2007). This reflects the bond underwriters discount and the costs of legal and other work in association with bond issuance.

In its analysis of bond financing costs, the CRC estimates a cost of $15.6 million for issuance expenses in the DEIS base case scenario. Columbia River Crossing Toll Bond Program, Scenario 1 - Base (DEIS) Toll on I-5 Only: (Baseline (Post Processed) Forecast) State-Backed Bonds - 30 Year Term. (Columbia River Crossing, 2010c). We use this as our baseline estimate of financing costs. As with interest costs, the amount could be higher depending on the timing of state and federal payments for the project.

2.5 Credit Card Cost

It is anticipated that a majority of those who use the CRC will pay for tolls by using debit or credit cards. The CRC will have to pay processing fees to banks and credit card companies associated with accepting these payments. According to documents released by the CRC, (Columbia River Crossing, 2010b), the annual costs of credit/debit card processing would be $2 million in 2020 rising to more than $5 million in 2035. Over the first 30 years of project operation, the estimated total cost of processing credit and debit card payments would be $142 million.

2.6 Sales Tax Cost

Washington construction projects are subject to state sales taxes. It is not clear from the DEIS that the project sponsors have made any allowance for the cost of paying these sales taxes to the state of Washington. Sales taxes do not appear to be included in the cost estimate. A search of the Columbia River Crossing website found no references to sales taxes to be paid on the construction of the bridge itself (Google search for "sales tax" site:www.columbiarivercrossing.org).

In the case of other major projects, such as the proposed 520 bridge in Seattle, the state has allowed for a sales tax deferral, i.e. allowing the sales tax to be paid after the bridge is constructed, out of toll revenues. For the 520 bridge, with a total price of $4.6 billion, the amount of the sales tax deferral is $300 million (Washington State Department of Transportation, 2010b). This works out to 6.5 percent of the cost of the project. If 50 percent of the CRC is in Oregon and not subject to the tax, then sales tax would apply only to the Washington portion. With a total construction cost of $3.6 billion, the Washington sales tax liability would be (.065*.5*3,600 million) or $117 million.

Based on this analysis, we use $117 million as our estimate of the cost of sales taxes due to the State of Washington for the CRC. This number could be higher or lower depending on the portion of the project built in Washington.

2.7 Supplemental Project Cost

In addition to the direct cost of constructing and operating the Columbia River Crossing,

P-061-004

it is likely that the traffic generated by this project will necessitate further expansions of the freeway system in Portland. The Oregon Department of Transportation has already identified the need for capacity expansion between the Fremont Bridge and I-84, a need that will be substantially increased by the construction of the Columbia River Crossing. ODOT estimates that such a project would cost between $780 million and $1.3 billion over and above the cost of the CRC (Tindall, 2008). In addition, since this would have to be financed exclusively by Oregon (i.e. no toll revenues, federal earmarks or Washington contribution), it would require a financial contribution from the State of Oregon in addition to the state's share of the CRC project.

The need for this expansion was confirmed by the URS analysis of the Columbia River Crossing—the effect of building the CRC is to move the traffic bottleneck on I-5 from the existing Columbia River Bridge, to the Rose Quarter area. The URS report concludes that without a change to the Rose Quarter, the effect of the CRC project will be to reduce travel times only one minute compared to the no-build.

> Compared with the No-Build conditions, the LPA Full Build and Phase 1 would reduce the average travel time during the two-hour peak period within the bridge influence area (BIA) from 19 minutes to 18 minutes (A.M. peak) and on I-5 northbound from 14 minutes to 6 minutes (P.M. peak). The relatively small travel time reduction on I-5 southbound is mostly due to the bottleneck around the I-5/I-405 split. (URS, 2010).

The Independent Review Panel convened to examine the project reached the same conclusion. Unless the chokepoint at the Rose Quarter is fixed, the utility of the entire CRC investment is jeopardized. They write:

> "Questions about the reasonableness of investment in the CRC bridge because unresolved issues remain to the south threaten the viability of the project." (Independent Review Panel Report, 2010, page 112).

The panel recommends a new set of traffic studies to test whether the CRC will simply shift the bottleneck south, and call for ODOT and the City of Portland to "fully develop a solution for I-5 from I-405 to I-84" and to program that solution in conjunction with the phasing of the construction of the CRC (page 113).

The Chokepoints report published by TRIP, a Washington DC based road advocacy organization, identified the I-5/I-405/I-84 exchange, that portion of the I-5 system between the Fremont Bridge and I-84, as the second most severe bottleneck in the Portland metropolitan area (TRIP, 2010). It actually carries more traffic than the I-5 bridges (135,000 vehicles per day vs. 127,000 for the I-5 bridges). According to the Chokepoints report, this project will require $800 million to $1.3 billion and $300 to $350 million for improvements to Broadway-Weidler and widening I-5 to 3 lanes in each direction (TRIP, 2010).

Based on the information in the 2008 ODOT report and the 2010 Chokepoints report we use a figure of $1.3 billion as the cost of supplemental projects that will be necessitated to

P-061-004

improve traffic flow on I-5 in the wake of the CRC project. The actual cost could be higher or lower depending on the scope of supplemental projects actually undertaken to address traffic congestion in this corridor.

2.8 Negative Economic Impact Costs

In addition to tax revenues, the project assumes that a portion of the project revenues will come from tolls levied on traffic using the I-5 bridge. The toll payments are estimated to be $120 million annually when the bridge opens to traffic, and rising to $220 million annually in 2030. These amounts include both the direct amount of tolls, as well as the $1.22 (2015) surcharge that will be levied on bridge users who do not purchase transponders. Money spent on tolls will largely be from local households and businesses, and represents money that would otherwise be spent elsewhere in the local economy. Again, the DEIS does not consider the economic or environmental impacts of shifting $100 million or more annually from consumer and business spending to toll payments. These impacts are likely to include lower levels of purchases of goods and services from local businesses, an associated reduction in employment at such businesses, and a loss of tax revenues from a lower level of business activity.

There will be significant economic impacts to the region from spending this $4 billion in construction costs, plus toll payments of $100 million or more annually indefinitely. The DEIS does not consider the impact of these diversions of money from other uses, and therefore omits a significant impact.

We have not undertaken an input-output analysis to compute the exact impact on sales and jobs, but we use as a rule of thumb that each $1,000,000 in consumer and business income diverted to pay for tolls produces a loss of ten jobs. This means that the project would result in the loss of 1,200 jobs initially rising to 2,400 jobs by 2030. While the project would result in temporary job creation during construction, this long term job loss would continue over the life of the project.

2.9 Transit Operating Costs

CRC's proposed Columbia River Crossing includes a light rail transit line extending the existing Max Yellow Line from the Expo Center in North Portland to a northern terminus in Vancouver. A portion of the costs of this line would be paid from fare box revenue, but in general, operating costs of light rail facilities exceed passenger fares. According to the Draft Environmental Impact Statement, the net incremental increase in operating costs for light rail above transit service that would be provided in the no-build case would be $2.96 million annually in 2010, with that amount expressed in 2007 dollars. The DEIS does not provide a year-by-year breakdown of net incremental operating costs. To estimate the 30-year cost of transit operations, we use the $2.96 million per year figure for each year, and convert it to year of expenditure dollars. The total 30-year incremental cost of transit is approximately $175 million.

2.10 Opportunity Cost

P-061-004

Opportunity cost is a term used by economists to describe the idea that if resources are used for one purpose, they cannot be used for some other purpose. Resources used to construct the Columbia River Crossing, for example, cannot be used for other transportation projects in the Portland metropolitan area. In the specific case of the Columbia River Crossing, there are opportunity costs for all of the transportation funds that would be shifted to pay for this project that could otherwise be used for other transportation projects in the Portland metropolitan area. There are three specific areas in which the region would be likely to experience significant opportunity costs in association with the Columbia River Crossing: federal earmarks, federal new starts funding, and state funding allocations.

Earmark Opportunity Costs. Federal earmarks or allocations for the CRC will reduce revenue available for other projects in the region. Like most other states, the State of Oregon used its political clout to get a special allocation of federal funds, or earmark. Virtually every state's delegation seeks and receives similar earmarks based on their delegation's priorities.

If the state makes the CRC its priority, it forgoes its opportunity to seek funding for other eligible projects that would provide statewide benefits. For example, in the last round of federal transportation funding, the state relied on earmarked federal funds to underwrite a significant portion of the cost of repairing state highway bridges. If the state seeks earmarks for the CRC, it will not be able to obtain those same earmarked funds for other projects.

CRC proponents have claimed that CRC earmarks will not reduce funding for other projects because the CRC is a "project of national significance" that would qualify for a separate source of funding. But in fact, the legislation that would allocate the next round of transportation funding has not been passed by either house of Congress, so no such program or source of funding now exists. And the leading proponents of transportation reauthorization such as Representative James Oberstar have specifically rejected the idea of earmarking funds in the next transportation bill. And while the proponents of the project regard it as having national significance, there is no evidence that anyone outside the region shares their view. Every region regards its projects as having national significance.

New Starts Opportunity Costs. The CRC anticipates that some $750 or $850 million of the project cost will come from federal "new starts" rail funding. But there is a limited amount of such funding, and historically, the Portland metropolitan area has gotten a disproportionate share of such funding. The region has another major project underway—the Milwaukie light rail line—which would also be funded from this same New Starts program. Funding for the light rail portion of the CRC project will compete for a limited pool of funds for new rail starts from which the region is asking for funding for the Milwaukie light rail.

IMPRESA

P-061-004

State Funding Opportunity Costs. The project will jeopardize state funding for other projects in the Portland metropolitan area. The Columbia River Crossing will be perceived by state policymakers as a project benefiting the Portland metropolitan area, and will jeopardize the ability of the region to get state funding for other projects in the region. In 2009, when the State Legislature identified a list of projects to be funded with increased gas taxes and vehicle registration fees, the Portland metropolitan area got a far smaller share of total funding than its share of population. It is likely that any state earmarks of funding for the CRC would reduce the likelihood that state funds would be allocated to the Portland area for other projects.

In the funding plan provided to the Independent Review Panel on June 17, 2010, the CRC makes it clear that it is counting on diverting funds from existing state and federal programs to pay for the costs of the project. The document "Funding Report" shows that federal money from "Safety-LU and federal interstate maintenance funds (both of which could be invested in other projects) have been used to pay for Columbia River Crossing planning (Columbia River Crossing, 2010a). Similarly the Oregon Transportation Commission allocated $30 million from House Bill 2001 to pay for Oregon's share of transportation planning costs, reducing funding available for other projects in Oregon.

3. The CRC Poses Major Financial Risks

P-061-005

The preceding section identifies the costs of the Columbia River Crossing, assuming that everything goes as currently planned. But there are considerable risks and uncertainties associated with the cost estimates outlined above. It is possible that a number of factors could cause the project costs to be considerably higher than the baseline estimates presented in Section 1.

3.1 Cost Overrun Risk

The project is at risk for substantial cost overruns. These costs would have to be met by the states.

The Independent Review Panel expressed grave doubts about the reliability of the current cost estimates. While the CRC has subjected the project to a "Cost Estimate Validation Process (CEVP)", the review looked at a different design from that now proposed. In addition, there have been other significant changes to the project features since the last detailed cost estimates were prepared. In the view of the IRP, uncertainty about the constructability of the novel open web design, the much more restrictive in-water work windows, changes to the alignment across Hayden Island, and the delay in deciding the number of lanes to be built, together effectively invalidate the cost analysis done to date, and mean that cost estimates can't be relied on in putting together a funding plan.

> Until these changed conditions are considered in conjunction with the other risks included in the CEVP, the credibility of the cost basis for the project as a means for communicating the needed funding and financing is problematic.
> Using data and information in the Base Estimate and funding/finance models that are not current and accurate can lead to potential delays in the review and approval process and receipt of a ROD. However, more serious is the concern that the Base Estimate and completion dates could be potentially so significantly different from that currently incorporated into the Final EIS, that seeking the necessary financing may be complicated and/or hindered since the confidence level would be significantly lower than would otherwise be expected with a risk based estimate that is based on the conceptual design and proposal included in the Final EIS. To the extent that the Base Estimate upper range potentially increases when the inputs and assumptions are revised to reflect information contained in the rest of the package, this could have a dramatic effect on the ability to finance the project and may also seriously impact the tolling policies under discussion. (Independent Review Panel, 2010, page 168).

There are substantial risks that construction cost estimates will be exceeded. ODOT's track record in estimating the cost of large highway construction projects suggests that the actual costs of the Columbia River Crossing may be much higher than the current estimates. Consider the two largest projects underway or in the late planning stages in Oregon: the Highway 20 widening in Lincoln County, and the Newberg-Dundee Bypass.

P-061-005

Please see the response to comment P-061-004 above.

P-061-005

ODOT's largest current project—a 7-mile long rebuild of U.S. Highway 20 between Corvallis and Newport—is more than 100 percent over budget. When it was planned in 2003, the project was supposed to cost about $110 million. The original design-build contract awarded in 2005 was valued at $129.9 million. After construction problems emerged, ODOT subsequently agreed to add $47 million to the contractor's compensation. Costs have continued to increase and the project is still incomplete.

By comparison, the amount the Oregon and Washington Departments of Transportation have spent on planning the CRC (roughly $130 million) is the same order of magnitude as the original budget for the U.S. 20 widening. The construction budget for the CRC—about $3.8 billion—is more than ten times larger than the U.S. 20 widening. Despite entering into a public private partnership that was supposed to insulate it from the risks of cost-overruns, the US 20 project, originally budgeted for $110 million, is currently budgeted for more than $230 million, and will take about two years longer to complete than originally planned.

In 2003, the forecast cost of the US 20 project was $110 million.

> "The estimated cost of the Pioneer Mountain to Eddyville project is $110 million dollars (2003 dollars). Construction is anticipated to begin in 2005 and take about 4 years to complete."
> (Federal Highway Administration and Oregon Department of Transportation, 2003)

Today, the project is not complete and has expended more than $234 million—more than double the original estimate (AASHTO, 2010).

And the effect of these overruns has been to take money that would otherwise be used for other transportation projects.

> Will the cost overruns of the Highway 20 project at Pioneer Mountain affect future state highway projects? It's possible, but it's too early to tell, said a spokesman for the Oregon Department of Transportation.
>
> "The fiscal effect is unknown at this time, but we know we're going to go above the $130 million construction budget," said Joe Harwood, an ODOT spokesman in Springfield. "We have a finite amount of money. Depending on how big a hit we take ... there's a very good likelihood we'll see projects delayed. In extreme circumstances, we might see projects canceled."
> (Rollins, 2007).

The next large project in ODOT's pipeline is the Newberg-Dundee bypass. Its cost has also more than doubled as it has moved through the planning process. At the time of the Draft Environmental Impact Statement on the proposed Newberg-Dundee bypass (2003), total project costs were estimated at $222 million. Just two years later, after additional, more precise engineering analyses, the cost had ballooned 40 percent, to more than $311 million (Oregon Department of Transportation, 2005). Today, it is estimated that

P-061-005

completing this project may require between $752 and $880 million (Federal Highway Administration and Oregon Department of Transportation, 2010).

Cost overruns would jeopardize future transportation investments. It has not been determined who would be responsible for cost overruns on the Columbia River Crossing.

> "WSDOT, ODOT, C-TRAN, TriMet, and possibly the Cities of Vancouver and Portland, must prepare agreements on roles and responsibilities for project development, construction, and capital funding that address such issues as project management and decision-making, capital cost sharing, how potential cost-overruns are managed, and contracting procedures."
> (Draft Environmental Impact Statement, page 4-42)

Cost overruns are a real concern in major transportation projects in the Pacific Northwest. For the proposed deep bore replacement for Seattle's Alaskan Way Viaduct, the State Legislature required the City of Seattle to pay for any cost overruns. In the case of the Columbia River Crossing, it is clear that the additional resources would be diverted from other transportation priorities in the state and the region. And once ODOT and WSDOT have embarked on bridge construction, it is clear that completing this project—regardless of its final cost—would absorb resources that would otherwise be available for other transportation projects.

3.2 Mega-project Risk

The sheer scale of the Columbia River Crossing increases the likelihood that actual costs will be much higher than currently forecast. The CRC is a mega-project. Mega-projects are defined as major investments that cost several hundred million to several billion dollars. Careful studies of such projects around the world show that in ninety percent of such projects costs are underestimated. For bridge and tunnel projects, average cost overruns were 33.8 percent (Flyvbjerg, 2009) Mega-projects have been consistently shown to suffer from "optimism bias": the tendency of project sponsors, operating in a political environment, to overestimate benefits, and underestimate costs and risk to build public support for a massive undertaking. The CRC modeling has not considered mega-project risk.

With its official price tag of $2.6 to $3.6 billion, the CRC is more than ten times larger than ODOT's current largest construction project (the Highway 20 project mentioned above). If ODOT had a well-established track record of building multi-billion dollar highway and transit bridge projects, one could look at past experience, and estimate the probability of realizing projected costs levels (and as the Highway 20 and Newberg Dundee Bypass histories show, costs are likely to be under-estimated). The much larger size of the CRC makes it even more likely that the project will experience substantial cost overruns.

Given the scale of the project, a typical mega-project cost overrun of about 33.8 percent would work out to more than a billion dollar cost overrun.

3.3 Housing Market Distortion Risk

P-061-005

Tolling will dramatically shift the demand for housing in Clark County. The DEIS contains no analysis of the impact of tolls on housing markets in the metropolitan region. The DEIS uses the same land use patterns (distribution of households and businesses in 2030) in all scenarios, and only varies the trip distribution of these households, given that land use pattern. But imposing peak hour tolls will shift the demand for housing in Clark County and also on the Oregon side of the river.

In effect, for workers who must cross the bridge on a daily basis for work, the value of the tolls is the equivalent of a financial penalty or tax on housing on the opposite side of the river. The capitalized value of the toll penalty associated with commuting to Portland from Clark County will be equal to between $30,000 and $40,000 in housing value: a person working in Oregon could afford a house worth $40,000 more than they could afford in Clark County, once one adjusts for income lost to tolling. The same is true of the much smaller number of workers living in Oregon and working in Washington: they will find it much more attractive to buy a house in Washington, than live in Oregon.

The effect of tolling will be two-fold. First, it will tend to lower housing values in Clark County, affecting both the home equity of Clark County home owners, and tax revenues paid to local governments in Clark County. Second, it will tend to reduce the amount of commuting between Oregon and Washington. These long term effects of the "toll penalty" are not explicitly addressed in the traffic modeling for the Columbia River Crossing, which assumes a fixed distribution of households and trip attractions. Over time the toll penalty will change both the location of households and trips, and the rate of travel between the two states.

3.4 Competing Bridge and Cross Subsidy Risk

The presence of the I-205 crossing greatly complicates plans to finance the I-5 bridge with tolls. It is an open question as to whether it is financially viable or practical to only toll one of the two crossings. Because this issue has not been resolved, it constitutes a risk to successfully completing the project.

The tolling plan for the CRC has not been finally determined. One set of alternatives involves tolling both the I-5 and I-205 crossings. For traffic management and financial reasons, it may be necessary to toll both bridges. If one bridge is tolled and the other bridge is not, there is a substantial danger of very significant diversion of traffic to the non-tolled bridge, with consequent increases in congestion. In its testimony on the project, Clackamas County has formally objected to tolling only I-5 because of the negative consequences for I-205 (County Chair Lynn Peterson Letter to Independent Review Panel, May 20, 2010).

Resolving the tolling regime for I-205 is essential to finalizing financing plans for the CRC. One factor that bond underwriters consider in evaluating toll-backed bonds is the presence of competing, non-tolled facilities (Seattle-Northwest Securities Corporation &

P-061-005

Montague DeRose and Associates, 2007). The presence of a non-tolled I-205 bridge poses a significant financial risk to the holders of bonds backed by tolls on the I-5 bridge. The dangers are that the I-205 bridge would encourage substantial diversion of traffic that would otherwise cross the I-5 bridge and pay tolls, and would also greatly limit the ability to increase toll rates in the future (because increasing I-5 tolls would simply divert more traffic to I-205). These considerations prompted one Independent Review Panelist, Dr. Michael Meyers, to candidly label the failure to toll both bridges as "stupid." (Independent Review Panel Meeting, June 17, 2010). For these reasons, it is likely that bond underwriters will push strongly for tolls on I-205 as well as I-5. In the absence of tolling both bridges, bond underwriters are likely to deeply discount the amount of debt that can be issued against future I-5 toll revenues. The financial analyses prepared by the Columbia River Crossing do not address this issue.

It may not be legal for the CRC to use toll revenues from the I-205 bridge to retire debt for the construction of a new I-5 bridge. According to the Federal Highway Administration, it is not legal for a state to use toll revenues from an interstate project to pay for a different project. According to FHWA, "The Interstate System Reconstruction and Rehabilitation Pilot Program requires that revenue from tolls be used only to improve the tolled facility . . . FHWA rejected Pennsylvania's request to use the money for other projects, because ". . . the application did not meet the federal requirement that toll revenues be used exclusively for the facility being tolled" (Federal Highway Administration, 2010).

As noted in section 1 of this report, there are serious flaws in the traffic projections prepared to date. In particular, the over-estimation of traffic under current non-tolled conditions, the very high value assumed for travel time, and the decision to manually adjust traffic model outputs to shift more vehicles to the I-5 crossing all inflate estimates of toll revenue. In reality, total traffic volumes may be much less, and diversion to the I-205 bridge is likely to be much higher than CRC projections estimate.

Tolling I-205 will require specific permission from the Federal Government, and may be illegal under federal law. And if I-205 is tolled, toll revenues from that bridge may not be legally available to pay costs associated with construction of the CRC. The uncertainty surrounding the toll regime, and potential revenues available for the CRC is a major risk to the project.

P-061-005

3.5 Unconditional Guarantee Risk

The states of Oregon and Washington would likely be required to offer an unconditional guarantee to bond holders, exposing the states to the risks of revenue shortfalls and cost-overruns. For example, if the cost of the project exceeded the $3.6 billion now estimated for the revised project, the two states would be liable for these costs. If the toll revenues from the project were insufficient to repay the bonds and interest, the two states would be legally bound to divert other revenues or raise taxes to repay bond holders. The financial plan does not estimate the costs to the states from these guarantees.

The likelihood is that additional funds will be needed. As noted earlier, 90 percent of mega-projects experience cost-overruns. Other sources of revenue may fall short of targeted contributions to the project either initially or over time. Bond rating agencies are likely to say that the project will support a smaller level of borrowing than the amounts estimated by the CRC. In addition, if traffic levels fall short of forecasts, it may be impossible to generate additional toll revenues by raising toll rates, because toll increases will trigger additional diversion of traffic, and lower traffic volumes will more than offset revenue gained from higher rates. It is also possible that federal funding may be less than expected, or may arrive more slowly than anticipated. All of these events have the effect of triggering additional liability for project guarantors.

The likelihood that the states will be called upon to guarantee bond purchasers against the effects of cost-overruns and revenue shortfalls has an added negative effect on the due diligence bond purchasers would otherwise provide for the project. If their financial return is guaranteed by the full faith and credit of the two states, investors have no reason to insist on a careful review of project forecasts. Under normal circumstances, lenders will provide a valuable service by independently evaluating key project assumptions. A guarantee undercuts this added review, and in effect represents a moral hazard in the construction and operation of the project, as bond holders have no incentive to offer strong oversight of the project because they are guaranteed repayment by the state whether or not the project succeeds.

3.6 Foregone Road Pricing Revenue Risk

Establishing tolls for the I-5 bridge may foreclose the opportunity to apply road-pricing to other segments of the highway system in the Portland metropolitan area. One reason that travelers will be willing to pay a toll to use a new I-5 bridge is that they are not charged a toll for using any of the highways that lead to I-5.

For the past several years, Oregon has been investigating comprehensive systems of road pricing. The 2009 Legislature adopted HB 2001 that requires a pilot congestion pricing program in the Portland metropolitan area not later than 2012 (Section 3). As gas prices rise, and as vehicle fuel efficiency improves and as alternative fuel vehicles emerge, it is

P-061-005

apparent that the gasoline tax may need to be replaced as a means of financing the transportation system.

Tolls assessed for crossing the I-5 bridges do not solely reflect the value travelers attach to the bridge, but reflect the value of the other infrastructure that enables travel to the bridge. Once the two states start collecting in excess of $100 million per year from travelers crossing the bridge, they will find it extremely difficult to persuade users to pay additional fees for using other parts of the highway system that function as bridge approaches. Those who purchase bonds secured by toll-revenues on the I-5 bridge may want assurances that the two states do not establish tolls or road pricing on the approaches to the bridge, because this would have the effect of lowering traffic on the bridge, and also lowering the willingness of travelers to pay higher tolls over time to use the bridge.

3.7 Federal Earmark Shortfall Risk

The CRC financing plan assumes a massive and politically uncertain level of federal earmarks. The CRC has asserted that the region can expect $400 million in federal earmarks for this project, and that because of the project's alleged unique characteristics these monies will be over and above federal revenue that the region could expect to get in the future.

But this level of earmarks dwarfs what has gone to any single project. And the climate for earmarks has changed dramatically from the last transportation bill in 2005. Senator Patty Murray—chair of the transportation subcommittee of the appropriations committee—has warned against expecting big funding for this project (Hamilton, 2008).

While the public statements of the CRC imply that this project can expect some special funding, the reality is quite different. The "Corridors of the Future" program which CRC implies is a special category, is defined to include freeway mileage that carries fully one-third of the nation's traffic, and is a bureaucratically created program of the Bush Administration, funded at a total of only $66.2 million nationally (U.S. Department of Transportation, 2008).

It is apparent that that the CRC will compete for virtually every federal dollar flowing into the region. In the text of the DEIS, the CRC makes it clear that every other source of federal money flowing to Oregon and Washington for transportation is fair game for the CRC, including monies dedicated to preservation and maintenance of the highway system (DEIS, Section 4-3).

In documents released to the Independent Review Panel, it is apparent that the Columbia River Crossing will compete for existing "formula" funds that are distributed to the states, and that are available for a wide range of transportation projects (Columbia River Crossing, 2010a).

P-061-005

3.8 New Starts Funding Shortfall Risk

The project's financing plan assumes that the federal government will provide $850 million in federal transit administration funding for the construction of light rail as part of the project.

There is a $100 million discrepancy between the project budget reviewed by the Federal Transit Administration and the amount of funding projected to be received from FTA. The FY 2011 New Starts report indicates that the CRC has requested $750 million for transit (Federal Transit Administration, 2010). The funding plan CRC submitted to the Independent Review Panel indicates that the project will receive $850 million in New Starts Funding from FTA (Independent Review Panel 2010, page 173).

The project assumes a very high rate of federal match, which may not be realistic. According to the FTA, the CRC project funding assumes that federal funds will cover 79 percent of the cost of the transit portion of the CRC (Federal Transit Administration, 2010). This is the second highest level of federal match anticipated by any project; most projects are asking for federal funding of 50 percent or less. The project competes with projects in other regions, and locally, including the Portland-Milwaukie Light Rail line, which has a higher priority in the New Starts evaluation process, and which is being funded at a 50 percent level of matching.

According to the IRP, it is uncertain whether the project will successfully compete for new starts funding, and if it does, whether it will receive the requested level of funding. In its evaluation, the FTA questioned the project's local funding support and its operating cost support. As a result, the IRP concluded:

> In the FY2011 New Starts Report, FTA noted concerns relative to the assumptions affecting the capital finance plan and the operating finance. Should the New Starts ratings decrease as a result of changes in assumptions, or as a result of economic conditions, or as a result of changes in project definition, or escalation of project costs, the project's ability to maintain the Medium rating needed to advance through the New Starts process [to] secure a recommendation for a FFGA (full funding grant agreement) could be at risk.
> (Independent Review Panel, 2010, page 181).

3.9 Schedule Delay Risks

Many of the costs associated with the Columbia River Crossing are influenced by how well the project can execute scheduled tasks. There are a variety of cost risks associated with delay. In the event of price inflation, a delay can produce higher prices, for labor or for materials. Delays also have a financial cost; if project completion is delayed, then interest expense rises and net revenue from tolling will be reduced.

P-061-005

The size and complexity of the Columbia River Crossing makes it difficult to accurately estimate project schedules. The record of the project's planning stages clearly illustrates these difficulties. The project has repeatedly fallen behind its stated schedule in achieving key planning milestones. For example, in December 2006, the CRC predicted it would issue a Final Environmental Impact Statement in September 2008 (Columbia River Crossing, 2006).

In May, 2009, the CRC schedule indicated that the Final Environmental Impact Statement would be issued in February, 2010 (Columbia River Crossing, 2009a).

Other special considerations make the project vulnerable to delays. Not only does the project involve managing construction in a heavily traveled interstate highway corridor, it also takes place in an environmentally significant area. The seasonal migration patterns of Columbia River Salmon—some of them listed as threatened or endangered species—require that in-water work be done only at certain times when fish are unlikely to be present. Small delays can be magnified if the project misses an opportunity to do construction in one of these available "in-water windows." According to the Independent Review Panel, the existing project schedule assumes that construction will be able to take place year-round, with no requirements to suspend in-water work during migration periods. However, it now appears that Endangered Species Act protections will require that in-water work take place only in four-month windows, rather than year-round. This seriously jeopardizes the ability of the project to be completed according to the current schedule.

> The IRP also understands that upon completion of the ESA draft that the in-water time period to perform work is a specific four-month window and there is no probability that it can potentially be eight months or even the entire year, thus severely restricting when in-water works can be performed. (Independent Review Panel, 2010, page 168).

Construction delays are a regular occurrence in such projects, as the experience with ODOT's largest current construction project, the U.S. 20 Pioneer-Mountain to Eddyville project indicates. The project is years behind schedule, having been delayed by previously unidentified geological problems, and a contractor's failure to adequately protect salmon habitat. Most recently, ODOT announced that construction is being suspended on four of the bridges that are part of the project because of concerns about geological stability. A routine examination found two bridge columns out of plumb in February, 2010, leading ODOT to suspend construction in June. It is not known when construction will resume on these bridges (Oregon Department of Transportation, 2010).

Conclusion

P-061-006

As currently proposed, this project faces three broad areas of very significant risk.

The cost of the project, as determined from CRC documents, is more than double the widely-publicized $3.6 billion construction-only costs. CRC's financial projections indicate that over thirty years, total costs of building and operating the project will exceed $8 billion dollars. Supplemental costs for related improvements, as recommended by the Independent Review Panel, will push costs to $10 billion, possibly more. Yet additional costs from potential and probable "mega-project" cost-overruns are unquantifiable.

The projected revenue from tolls is significantly overstated due to errors in the underlying traffic assumptions. These errors exaggerate expected cash-flow, and overstate the project's ability to service debt. Because no serious, independent investment grade analysis of tolling has been undertaken, the project's ability to secure favorable bond ratings and obtain the amount of debt needed is highly doubtful.

The project relies on funding from multiple federal programs, and it is highly improbable that all programs will be available, or that they will produce the optimistic levels of funding projected for each program, for the period of time that the funds will be required.

Each factor separately poses significant risk for Oregon's finances, since only the two states can fill the gaps caused by increased costs, toll revenue shortfalls, and unfavorable federal funding actions and timing. Together these risk factors compound to create virtually certain additional demands on the states' finances that have not been adequately addressed or analyzed.

Proceeding with this project based on the unreliable and highly over-optimistic work done to date exposes the region to enormous financial risks. Just as one would insist on an independent certification that the bridge's physical design was sound, decision-makers should insist that the financial plan for the Columbia River Crossing is not one which is so poorly designed that it is liable to collapse. Before taking any further steps which would commit to this risky course of action, the region's leaders should insist on a careful, professional and completely independent review of the project's financial plan.

P-061-006

This comment summarizes the above comments. Please see the responses to comments above.

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Executive Summary 1
1. CRC Traffic Forecasts Are Inaccurate 5
1.1 CRC traffic forecasts have already proven to be inaccurate 5
1.2 CRC traffic forecasts do not account for higher gas prices 9
1.3 CRC traffic forecasts are outdated 10
1.4 CRC forecasts inflated I-5 traffic estimates using "post processing" 11
1.5 CRC forecasts over-estimate the value of travel time, under-estimating toll diversion, and over-estimating revenues 11
1.6 Inaccurate toll forecasts threaten CRC financial viability 13
2. Total 30-year CRC Costs will total nearly $10 billion. 15
2.1 Construction Cost 16
2.2 Interest Cost 16
2.3 Toll Collection Cost 19
2.4 Bond Issuance Cost 19
2.5 Credit Card Cost 20
2.6 Sales Tax Cost 20
2.7 Supplemental Project Cost 20
2.8 Negative Economic Impact Costs 22
2.9 Transit Operating Costs 22
2.10 Opportunity Cost 23
3. The CRC Poses Major Financial Risks 25
3.1 Cost Overrun Risk 25
3.2 Mega-project Risk 27
3.3 Housing Market Distortion Risk 28
3.4 Competing Bridge and Cross Subsidy Risk 28
3.5 Unconditional Guarantee Risk 30
3.6 Foregone Road Pricing Revenue Risk 30
3.7 Federal Earmark Shortfall Risk 31
3.8 New Starts Funding Shortfall Risk 32
3.9 Schedule Delay Risks 32
Conclusion 34
References 35

IMPRESA

Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 8:40 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 3

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem 3
To: feedback@columbiarivercrossing.org
Unanswered excessive cost issue

P-062-001

Please do not approve this project. Here are fundamental reasons why it should be rejected:

The CRC Light Rail project fails to solve the fundamental transportation problems for our region. The most obvious bottleneck of the I-5 corridor lies 2 miles south of the Columbia River at the Rose Quarter where the freeway necks down to 2 lanes in each direction. Congestion at that location is easily verified by showing the traffic flow as displayed by Google Traffic history for the region. If a fundamental goal that the CRC project is to improve traffic flow, improve congestion, and make the I-5 safer in this region, then the CRC project misses the choke point by several miles.

Not only does the project miss the target, with much of the expense and work focusing several miles north of the river, it also fails to improve the actual bottleneck. The plan does not include fixing that most obvious chokepoint. The work north of the river does not include adding lanes and therefore wastes resources on a problem that does not exist north of the river. The problems are south of the river.

The CRC's own documentation shows that after the multi-billion dollar project is complete, the average commuter will save 1 to 2 minutes. The CRC documentation also show that the corridor will still be full and congestion will still be a problem. Instead of actual construction or freeway improvements relieving congestion, the plan calls for reducing congestion be discouraging drivers by charging tolls. This will be an especially frustrating situation for drivers who will be stuck with billions in debt, tolls in place of a freeway, and continued aggravating congestion.

It would be irresponsible to move forward with this project with such glaring red flags.

Please acknowledge receipt of this letter to:

David Madore
david.m@usdigital
1400 NE 136 Ave
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cell: 360-601-3056

P-062-001

The Oregon Department of Transportation (ODOT) completed Phase I construction of the I-5 Delta Park widening project in fall 2010. Phase I of the project involved widening I-5 and lengthening the entrance and exit ramps at Victory Boulevard and Columbia Boulevard. Phase II involves improving local streets and will begin when funding is secured. Phase I of the Delta Park project widened the current 2-lane segment of southbound I-5 to 3 lanes. There are currently no immediate plans to widen I-5 south of Delta Park. Neither the CRC project nor the Delta Park projects are intended to address the southbound traffic congestion that currently exists near the I-5/I-405 split. However, traffic analyses show the congestion at the split will not be worsened because of the Columbia River Crossing project. The main reason is that fewer cars are expected to cross the river with a project in 2030 than without a project. This is due to the provision of improved transit service and tolling.

Beyond the CRC and Delta Park projects, the I-5 Transportation and Trade Partnership Final Strategic Plan recommended a comprehensive list of modal actions relating to: additional transit capacity and service; additional rail capacity; land use and land use accord; transportation demand/system management; environmental justice; additional elements and strategies (such as new river crossings); and financing. RTC and Metro are tasked with initiating recommendations as part of their regional transportation planning role. Examples of current efforts include RTC's evaluation of future high-capacity transit in Clark County, and evaluation of needs for future river crossings. Regional planners have investigated solutions to existing bottlenecks at the I-5 connections with I-405 and I-84. ODOT is responsible for conducting ongoing studies to identify other congestion problems on I-5 in Oregon that may need to be addressed in the future.

Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 9:13 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 4

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem 4
To: feedback@columbiarivercrossing.org
The NEPA Process was not followed since a 3rd bridge was wrongfully excluded

P-063-001

Please do not approve this project. Here are fundamental reasons why it should be rejected:

The CRC Light Rail project fails to solve the fundamental transportation problems for our region. The I-5 Corridor has historically included and still includes a much broader region including the I-205 and several miles east and west of the I-5 and I-205 Bridges across the Columbia River.

The region's traffic problems in the I-5 corridor are due in large part to funneling interstate traffic across only two bridges, the I-5 and the I-205. The NEPA process requires practical and appropriate fit for function solutions for the region to be seriously considered. The NEPA process was effectively voided by excluding the most obvious alternatives of constructing a 3rd bridge in the region. The exclusion is so obvious that it ignores the 20 year plans that were already adopted by the transportation authorities. Those plans show a 3rd bridge at NE 192nd Ave, 4 miles east of the Glenn Jackson Bridge and another bridge further west of the I-5 Bridge.

The exclusion of a 3rd and 4th Bridge flies in the face of common practice for cities around the US that typically include one or and two freeway rings that route traffic around the heart of cities. Yet the CRC plan does not even allow one ring to bypass the region's heaviest traffic. This is a fundamental flaw and demonstrates the shortsighted and incompetence of the planners for this project.

Not only was a 3rd bridge not properly included in the possible solutions as the NEPA process requires, but the extreme cost of this project essentially eliminates the practical possibility of constructing a 3rd bridge in the future because the CRC project consumes all available resources and adds hopeless debt that will continue to consume all available funds for at least 3 decades to come.

Adding a 3rd Bridge at NE 192nd Ave (192nd Ave Bridge), 4 miles east of the Glenn Jackson Bridge and connecting at I-84 at exit 13 would allow the already congested Glenn Jackson Bridge to be relieved. This would also relieve congestion and improve safe traffic flow along the I-5in the region due to the new route that drivers can choose as they approach the I-5 / I-205 split southbound on north of Vancouver and northbound south of Portland. As drivers approach those decision points, electronic signs can inform drivers of the approximate times to take each route.

The 192nd Ave Bridge would unload the Glenn Jackson bridge without having to create a new corridor. It simply connects the existing corridors of the I-84 and SR-14. The newly relieved

P-063-001

Third crossing locations were considered and dropped because they could not meet the purpose and need for the project, as described in Chapter 2 of the FEIS. Please see responses to Mr. Madore's other FEIS comment letters and the response to letter P-077 regarding bypass and new crossing options.

P-063-001

Glenn Jackson Bridge would naturally attract more drivers as they are informed of the faster I-205 from the I-5.

This most obvious solution would be lower cost and simpler that then CRC project would relieve the I-5 congestion and ensure safer more efficient traffic throughout the region. The NEPA process was not followed when this obviously more practical solution to the region's traffic needs was excluded.

It would be irresponsible to move forward with this project with such glaring red flags.

Please acknowledge receipt of this letter to:

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Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 9:35 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 5

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem 5
To: feedback@columbiarivercrossing.org
The NEPA Process was not followed by failing to in a very low cost BNSF lift span

Please do not approve this project. Here are fundamental reasons why it should be rejected:

P-064-001

The existing I-5 Bridge has a lift span and a light span. The bridge operator keeps a manual log that records the date, time of each lift and the type of vessel that requested the lift. The CRC neglected to disclose that the majority of bridge typical lifts is for personal recreational sailboats with very tall masts. The NEPA process requires that all practical alternatives that can solve the major problem. This NEPA process was not followed for this project because a simple low cost program could provide sailboat owners the means to equip their sailboats with masts that can be lowered in order to clear the bridge without a lift.

Most of the time, commercial vessels can safely pass under the high span of the bridge and not require a lift. Exceptions occur sometimes when the river flow is fast. When that happens, even though those commercial vessels can fit through the high span, the fast river flow does not allow them to safely make the sharp S-curve to navigate to the BNSF railroad turnstile at the north bank of the river. A low cost solution would be to add a lift span to the BNSF railroad bridge near the center of the river. Adding that lift span (costing less than $60 million) would allow those commercial vessels to navigate a near straight line through the high span without requiring a lift. That would eliminate most lifts for commercial vessels during those fast river flow periods.

That low cost system level alternative was not included as a viable alternative as the NEPA process required.

It would be irresponsible to move forward with this project with such glaring red flags.

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P-064-001

Eliminating bridge lifts would provide a safety improvement. Relocating the BNSF railroad bridge swing span could reduce the number of times the I-5 bridge would need to lift, but it would not eliminate the need for bridge lifts. The I-5 bridge would still need to lift for regular monitoring and maintenance and for occasional taller vessels such as construction barges and high-mast recreational vessels. More importantly, simply moving the BNSF swing span, which is private property, would address only a small portion of the identified traffic safety issues, and almost none of the other stated Purpose and Need for the proposed action as described in Chapter 1 (Section 1.3) of the DEIS and FEIS.

Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 9:39 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 6

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem 6
To: feedback@columbiarivercrossing.org

P-065-001 The NEPA Process was not followed by failing to include an option without light rail

Please do not approve this project. Here are fundamental reasons why it should be rejected:

The NEPA process requires all viable alternatives to be considered for major projects. The CRC project failed to include an bridge without light rail. This is in clear violation of the NEPA process. It fails to comply with the law especially since opposition to light rail is a primary reason why Clark County residence oppose this project.

It would be irresponsible to move forward with this project with such glaring red flags.

Please acknowledge receipt of this letter to:

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cell: 360-601-3056

P-065-001

The EIS included alternatives that had bus rapid transit, rather than light rail, as the primary high capacity transit mode. Alternatives without high capacity transit were considered in the early alternatives analysis but they were unable to meet important elements of the purpose and need.

Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 9:58 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 7

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem 7
To: feedback@columbiarivercrossing.org
The NEPA Process was not followed by conducting design and studies to run concurrently

P-066-001

Please do not approve this project. Here are fundamental reasons why it should be rejected:

The NEPA process is a clear simple concise process defined by law to ensure that major projects are practical and logically proceed in a sequence that best meets the needs of citizens by evaluating all viable options before resources are consumed on design and construction plans before the vetting process selects a clear choice.

The CRC project violated the NEPA process in an unprecedented way. Except in emergency situations such as the Minneapolis bridge collapse to build the I-35W, no other project in the US has proceeded with the vetting process in parallel with the design process as the CRC project has. The reason is that it violates the intent of the NEPA process which is intended to vet all the choices first to determine which one is the best fit for function. The CRC project proceeded for 4 years consuming over $100 million with a bridge design before the alternatives were properly vetted. As a result of the haste and incompetence, the bridge design was scrapped within 4 weeks after it was made public. The violation of the NEPA process resulted in substantial loss and waste. The project should have been stopped and investigation conducted and corrective measures should have been taken to bring the project into compliance. That never happened. The project has continued to flounder as a result of improper sequences that continue to comply with the NEPA process.

It would be irresponsible to move forward with this project with such glaring red flags.

Please acknowledge receipt of this letter to:

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P-066-001

The approach was consistent with NEPA requirements. Developing some level of design for the alternatives is necessary to complete the NEPA review. The DEIS did not propose a particular bridge type. It defined the bridge in terms of vertical and horizontal parameters, capacity, and pier configuration. Some potential bridge types were conceptualized early and those were shown to the public. Well after the DEIS was issued, one bridge type (open web box) emerged as the likely preferred approach. The Bridge Expert Review Panel recommended that the project instead select one of three other bridge types, which the project did (selecting a composite deck truss). The composite deck truss bridge type fits within the parameters of the design and impacts evaluated in the DEIS, and was one of the bridge types that had been considered earlier in the process. The bridge type evaluation process is described in Chapter 2 of the FEIS.

Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 10:16 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 8

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem 8
To: feedback@columbiarivercrossing.org
The NEPA violated obvious logic for political reasons

Please do not approve this project. Here are fundamental reasons why it should be rejected:

P-067-001

The CRC was based on obvious fallacious logic by adopting a solution that was clearly violated common sense.

Years ago, we could have started a $5 billion experiment. Rather than spending 1/10 of that cost to widen their freeways, Portland could construct light rail on a grand scale throughout their city to relieve their traffic congestion. They could build a blue line, red line, a green line, and a yellow line.

They could clearly prove beyond a shadow of a doubt that spending gas taxes on light rail instead of highways would obviously solve their congestion problem.

When the I-205 was constructed, Glenn Jackson left a wide swath of green grass in the middle, enough to add multiple lanes in each direction to accommodate future demand and relieve congestion as needed. The experiment could include consuming that space with light rail instead. As Clark County drivers entered Portland, they could zip through congestion free and celebrate the success of the light rail experiment. Or they could sit there in stop and go traffic congestion with plenty of time to evaluate the failure of the experiment. In time, real world results would speak for itself.

Welcome to the year 2011 when we are clearly in a position to objectively evaluate Portland's $5 billion experiment. The $5 billion question is this: Has light rail solved their congestion problem? Is their traffic congestion much better or much worse than Clark County, where zero dollars were spent on light rail?

If light rail solved Portland's congestion problem, then Clark County should catch up and invest billions to bring it to our side of the river. If Portland's traffic congestion is a disaster, then wouldn't we be blind fools to squander our gas taxes on such a boondoggle in Clark County? After all, who could argue with a real world $5 billion experiment?

It would be irresponsible to move forward with this project with such glaring red flags.

Please acknowledge receipt of this letter to:

David Madore

P-067-001

Light rail transit alone is not intended to address the congestion-related need defined for the CRC project. Modeling indicates that some trips will shift from auto to transit, some trips will not be taken because of the toll, and highway improvements will provide additional congestion reduction.

david.m@usdigital.com
1400 NE 136 Ave
Vancouver, WA 98684
cell: 360-601-3056

Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 10:26 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 9

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem 9
To: feedback@columbiarivercrossing.org
The CRC Project has many symptoms that indicate the high likelihood of organized crime

P-068-001

Please do not approve this project. Here are fundamental reasons why it should be rejected:

Forensic Accountant Tiffany Couch has investigated and found numerous red flags indicative of fraud, corruption and organized crime. Her credentials as a nationally respected expert in the field of fraud and corruption, as well as her experience as an investigator and instructor speak of her competence. The mismanagement and the failure for the CRC project staff to account for over $15 million indicate that an investigation is in order and the project should held until a thorough investigation can be conducted to determine if organized crime is involved in this project.

It would be irresponsible to move forward with this project with such glaring red flags.

Please acknowledge receipt of this letter to:

David Madore
david.m@usdigital.com
1400 NE 136 Ave
Vancouver, WA 98684
cell: 360-601-3056

P-068-001

The Record of Decision concludes the environmental, and alternatives analysis. It indicates which alternative has been selected by the federal government, and allows for the continued design and eventual construction of that alternative. The Locally Preferred Alternative is supported by local, regional, state, and federal agencies and has been selected following an exhaustive analysis and public involvement program.

The project takes the issues of financial management very seriously. Project staff have provided Ms. Couch and Mr. Madore with considerable records and reports and has responded to their inquiries. The project is currently developing new financial reporting mechanisms and has started providing monthly reports on the web. The project will continue to work with the public to improve transparency and an understanding of the resources required for an undertaking of this scale.

Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 10:30 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 10

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem 10
To: feedback@columbiarivercrossing.org
The NEPA Process was not followed

P-069-001

Please do not approve this project. Here are fundamental reasons why it should be rejected:

The NEPA process requires that the FEIS approval process is to include public testimony and allow the public to have a voice in the process. The public was not allowed to have a voice in that process at the Vancouver City Council meeting or at the C-Tran meeting where the board members voted to give their final approval to this project.

It would be irresponsible to move forward with this project with such glaring red flags.

Please acknowledge receipt of this letter to:

David Madore
david.m@usdigital.com
1400 NE 136 Ave
Vancouver, WA 98684
cell: 360-601-3056

P-069-001

The National Environmental Policy Act (NEPA) and its regulations do not require a public hearing on a Final EIS (FEIS). Comments on the FEIS were accepted for more than 30 days following its availability and four public meetings were held during that period to provide opportunities for the public to comment and ask questions.

Any concerns about procedures at C-TRAN Board meetings or City of Vancouver Council meetings should be addressed with those agencies.

Hines, Maurice

From: David Madore [David.M@usdigital.com]
Sent: Monday, October 24, 2011 10:35 PM
To: Columbia River Crossing; David Madore
Subject: CRC Light Rail Crossing Project – problem 11

24 Oct, 2011
Re: CRC Light Rail Crossing Project – problem 11
To: feedback@columbiarivercrossing.org
No funding for light rail operations and maintenance

Please do not approve this project. Here are fundamental reasons why it should be rejected:

P-070-001

The CRC project includes the construction of light rail. Yet this project has no provision for funding the operation and maintenance of light rail. A vote is promised for next year. Clark County has had 2 light rail votes in the past and both failed. There is still a strong opposition to light rail. A vote for light rail O&M next year is likely to be fail again. Current law does not allow tolls to be used for light rail. It would be poor stewardship to construct a light rail line that has no funds to operate it. It is a fundamental flaw that calls for this project to remain unapproved as long as no O&M funds are available to fund light rail.

It would be irresponsible to move forward with this project with such glaring red flags.

Please acknowledge receipt of this letter to:

David Madore
david.m@usdigital.com
1400 NE 136 Ave
Vancouver, WA 98684
cell: 360-601-3056

P-070-001

A public vote on funding for C-TRAN's portion of the light rail operations is anticipated for 2012.

From: Martin_Thomas [mailto:martt906@hsd.k12.or.us]
Sent: Friday, October 07, 2011 2:46 PM
To: Columbia River Crossing
Subject:

P-071-001

Hi, my name is Tommy martin from century high school and I'm doing a research paper on the CRC and was wondering if the febery,23 draft of the 17th street max line draft was the final draft for the line, and if not I was wondering if It was possible to get the final copy of the draft for the paper.

P-071-001

Mr. Martin received a response from CRC staff on October 11, 2011.

Hines, Maurice

From: Kathleen Meunier [kmeunier1@aol.com]
Sent: Sunday, October 23, 2011 6:20 PM
To: Columbia River Crossing
Subject: feis comments
Attachments: Mom_CRC_comments-1.odt

document is attached and below.

P-072-001

As a physician I am deeply concerned about the health consequences that will be suffered by the residents of Hayden Island Manufactured Home Community (HIMHC) if the CRC project goes forward as proposed in the FEIS.

The residents of the HIMHC are of low income. It is well documented that low income populations are less healthy than wealthy communities. Less healthy individuals are more likely to become ill and/or die when exposed to threats to their health, than healthier persons. More low income residents will become ill and/or die when their health is threatened than would a healthier wealthier community.

The residents of the HIMHC are primarily elderly, 60% are 65 years or older. The community also includes about 100 children. It is well documented that the segments of society most likely to become ill and/or die when their health is challenged are the young and the old. A threat to health that the general population can tolerate with minor transitory diminished health, can kill the young and the old.

The HIMHC residents compound the intolerance for health risks known to be found in low income populations as well as the intolerance for health risks known for the young and old segments of society. A low income population which is also composed of the elderly, as well as children, maximizes the inability of the group to tolerate challenges to their health without suffering illness and death.

In the HIMHC, in addition to the well documented diminished capacity to tolerate health challenges found in the low income populations as well as found in the young and old segments of society, there is already established illness present, including those with respiratory illness, so severe they are already requiring home supplemental oxygen treatment. The HIMHC residents are not a typical community and are not adequately protected by mandated minimum environmental standards.

The CRC would be hard pressed to find a population more at risk to suffer significant adverse consequences from the CRC construction than the HIMHC. Members of the HIMHC will become ill and die if the CRC project proceeds as planned, especially if it uses the Thunderbird Hotel site, which is immediately adjacent to the HIMHC.

Standards for air quality, and other environmental factors assume a typical demographic which has the capacity to withstand health challenges. The CRC is choosing to site the project directly impacting a low income community of the young and old with preexisting significant illnesses and physical limitations, the HIMHC. Therefore the allowable air quality and other environmental factors must be tailored to the much much stricter criteria of what a low income young and/or old person with preexisting significant illness can tolerate without increased ill health. Either the project should be maximally moved away from the known location of these low income young and old or the CRC should be held to meet strict environmental standards that a low income young and/or old person with preexisting illness can tolerate without increased ill health.

There are alternatives, rather than what the CRC proposes, which would move the main construction away from the HIMHC, a community which will suffer significant adverse outcomes, including death, disproportionate to what virtually any other population would experience if exposed to the same assault to their health and well-being. An example of such an option is Jim Howell's "Common Sense Alternative."

The threat to the health and well-being of the HIMHC is not limited to the decrease in air quality, the noise and vibration, the disruption of utilities in a population uniquely dependent on access to utilities for the

P-072-001

You have asserted that if the CRC project proceeds as planned it will result in the illness and death of some residents of the Hayden Island mobile home community. The analysis of air quality, noise, and other impacts that can affect health indicate that the project will not result in any violations of air quality standards, can mitigate most long-term noise impacts (to fewer noise impacts than occur under existing conditions), and can keep construction-related air and noise impacts below standards established to protect human health. You note that a larger threat to health from the project is chronic stress. The effects of the project on chronic stress of residents were not specifically evaluated for the FEIS. However, the project has committed to staging construction and mitigating construction impacts as much as practicable (measures are listed in the FEIS and in the mitigation commitments included in the ROD) in order to minimize disturbance and inconvenience to nearby residents.

P-072-001

operation of medical equipment. The larger threat to the health, well-being and lives of the HIMHC residents as a direct result of the CRC project are the well documented significant adverse health consequences of chronic stress. Chronic stress increases the atherosclerotic plaques of vascular disease. Vascular disease is the #1 cause of death in the United States of America. Chronic stress depresses the immune system, reducing a person's ability to resist infection and cancer. Chronic stress increases irritability which correlates with isolation which correlates with decreased health. Chronic stress correlates with shallow respirations which decrease oxygenation as well as leaving the dependent portions of the lung unexpanded and therefore predisposed to developing pneumonia. Pneumonia frequently results in death in elderly people. The chronically stressed person holds him/herself more stiffly and is less able to concentrate. The chronically stressed elderly person is more likely to fall and break their hip. There is a high incident of death in the six months following a hip fracture suffered from an elderly person.

80-90% of patient visits to a primary care doctor are regarding stress related symptoms. Chronic stress is a very real threat to health and well-being. The very real significant adverse and well documented consequences of chronic stress will be especially devastating to the residents of HIMHC as they have the diminished capacity to tolerate challenges to their already fragile health status being of the compounded high risk groups of low income and the elderly and/or young.

The intensity of adverse health consequences of chronic stress correlates with a person's sense of powerlessness. The poor and the elderly and the young lack a sense of power. The CRC has made it clear they do not regard the HIMHC as having any real input into the CRC project thereby maximizing chronic stress in the HIMHC.

What the CRC proposes would subject the HIMHC's fragile citizens to at least 10 additional years of unrelenting high chronic stress. Many will become ill. Many will die. Illness and death that will happen as a direct result if the CRC project goes ahead as planned.
The CRC should have to acknowledge and adequately accommodate the fragile health of HIMHC or move their project distant from this endangered low income elderly community.

The CRC should acknowledge the highly toxic consequences of chronic stress and that the CRC project has been posing a very real threat to the health of HIMHC residents for several years already by invoking chronic stress in the HIMHC residents. The CRC should immediately being offering weekly sessions on abating the consequences of chronic stress that are taught at HIMHC by qualified instructors on a variety of practical techniques that can decrease the highly adverse health impacts the CRC is already inflicting on this low income elderly population.

There are alternatives to what the CRC is proposing. There is no necessity to cause avoidable illness and death in a low income elderly population. If a wealthy community was situated where the HIMHC is situated, the site would never have ever been considered. Don't we have laws about not taking advantage of disadvantages groups like the poor and the elderly? Shouldn't they apply here?

I am deeply concerned.

Sincerely,

Kathleen Meunier, M.D.

P-072-001

As a physician I am deeply concerned about the health consequences that will be suffered by the residents of Hayden Island Manufactured Home Community (HIMHC) if the CRC project goes forward as proposed in the FEIS.

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The HIMHC residents compound the intolerance for health risks known to be found in low income populations as well as the intolerance for health risks known for the young and old segments of society. A low income population which is also composed of the elderly, as well as children, maximizes the inability of the group to tolerate challenges to their health without suffering illness and death.

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There are alternatives, rather than what the CRC proposes, which would move the main construction away from the HIMHC, a community which will suffer significant adverse outcomes, including death, disproportionate to what virtually any other population would experience if exposed to the same assault to their health and well-being. An example of such an option is Jim Howell's "Common Sense Alternative."

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P-072-001

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I am deeply concerned.

Sincerely,

Kathleen Meunier, M.D.

Hines, Maurice

From: Kelly Meunier [kmeunier@willamette.edu]
Sent: Sunday, October 23, 2011 2:44 PM
To: Columbia River Crossing
Subject: Final Environmental Impact Statement comments
Attachments: Kelly CRC comments.docx

P-073-001

Attached and below are my comments to the FEIS.

HIMHC – Hayden Island Manufactured Home Community – on western Hayden Island

EJ – Environmental Justice Community

FEIS – Final Environmental Impact Statement

CRC – Columbia River Crossing

NEPA – National Environmental Policy Act

EO - Presidential Executive Order 12898

LPA – Locally Preferred Alternative

GHG – Green House Gases

Hot Spot – testing for carbon monoxide and particulate matter

NPDES – National Pollutant Discharge Elimination System

As a resident of Portland it is unavoidably clear to me that Hayden Island Manufactured Home Community (HIMHC) qualifies as an environmental justice (EJ) community. HIMHC is a low income community, predominately composed of elderly residents on social security as well as approximately 100 children. The methodology used by the CRC to determine the demographic characteristic of HIMHC was undeniably different from the rest of the areas evaluated by the CRC. CRC intentionally chose a different methodology when looking for low income in Oregon (census tracks) than in Vancouver (block groups). Interestingly, CRC used block group data when looking to see if minorities were disproportionately impacted in both Oregon and Washington. It seems that CRC uses whatever methodology gives the desired results.

1

P-073-001

The demographic data presented for the Hayden Island Neighborhood in Chapter 3 (Section 3.5) of the DEIS was taken from the 2000 U.S. Census and cut to the neighborhood boundaries. The U.S. Census estimated a total of 2,071 residents on the Island, which is in-line with the population estimate of 2,155 residents conducted in 2007 by the City of Portland for the Hayden Island Planning process. In an effort to more accurately reflect the Island population, the FEIS assessment is based on data from the 2010 Census, the American Community Survey, and a project-specific survey of potentially displaced households. Updated population and demographic information can be found in Chapter 3 (Section 3.5) of the FEIS.

The displacement survey (which focused on the most directly impacted households) was undertaken in response to assertions that the Census data misrepresented the affected community. The U.S. Census data indicate that, as a whole, the Hayden Island neighborhood has a lower proportion of minority and low income households than in the City of Portland, Multnomah County, or in the project study area. Hayden Island ranks near the lower end of the spectrum in both minority and low income household composition when compared with all other neighborhoods in the study area. Households within the Hayden Island Manufactured Home Community (HIMHC) were not surveyed; but these households also will not be displaced. There are many neighborhoods within the study area that will be adjacent to construction and impacted by construction activities. Many of these neighborhoods will also be directly impacted by residential displacements, although there will be no households displaced from the HIMHC. The project has not found that the impacts experienced by residents of the HIMHC would be disproportionately more severe than those experienced elsewhere in the project area. However, the project recognizes that there are low income and minority households on Hayden Island. And the project will remain open to the potential for specific, vulnerable populations to be present in

P-073-001

Executive Orders 12898 and 12948, requires each federal agency to make achieving environmental justice part of its mission "by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

Based on EO 12898 and NEPA requirements the CRC is obligated to determine low income and minority populations within the project area that will be disproportionately and highly adversely affected. Low income and minorities populations tend to cluster. The sample size used to determine low income or minority populations, if constructed to include only a portion of the population concerned or made sufficiently large to include non-pertinent populations, will deliberately obscure the identification of a true environmental justice community. The use of census track data instead of block group data on Hayden Island gives the appearance of a blatant effort by the CRC to mask what is undoubtedly an environmental justice community, HIMHC, within the project area.

The CRC's arbitrarily narrowed drawing of the project boundaries again gives the appearance of a deliberate effort to exclude additional environmental justice communities that are well-known to be present within the North Portland area. Moreover, clearly the environmental impact of this project will not only effect the very narrowly CRC identified corridor/parameters, but will further extend into the North Portland area that is home to minority and low income populations.

It is my stance that NEPA requires CRC to make a good faith effort to meet the requirements of EO 12898. This requires CRC to accurately evaluate the project area by not only considering direct impacts of construction on the immediate surrounding area but also to consider air quality impacts which will affect a greater area. North Portland which is currently surrounded by the filth of highway pollution, pollution from waste facilities, toxins from industrial facilities, I-205 which is home to a growing minority population as they are being economically forced from inner NE Portland, I-84 which is already heavily congested will have even greater congestion as a result of this project, are being completely excluded from the DEIS and FEIS when evaluating CRC's environmental impact. **This is gerrymandering.**

Using a census track to determine low income in Oregon instead of block group data, which was used for all other EJ testing, shows a conscious intent on CRC's part to masks the true nature of the HIMHC community. Portland has a higher cost of living than some other states, so

the HIMHC. The project has worked closely with the community on Hayden Island to identify unique impacts and develop mitigation. The implementing federal and state guidelines on Environmental Justice have and will guide the project's consideration of, outreach to, and mitigation of impacts for these households.

P-073-001

using the federal poverty line is absolutely inappropriate as a comparison. HIMHC is significantly low-income relative to the City and County median household income. Even using the inapplicable comparison of the federal poverty line, if a proper income survey was done at HIMHC it would have been unavoidably clear that HIMHC is a low income community qualifying for environmental justice status. HIMHC was not surveyed, although such a survey was done in other communities. Being a low income community means that HIMHC deserves environmental justice (EJ) status under NEPA. The FEIS failed to identify HIMHC as an environmental justice community. **This is gerrymandering**. HIMHC is due EJ status and all the protections that come with it. Until CRC makes HIMHC an EJ community it is in clear violation of NEPA requirements.

The DEIS and FEIS exemplify CRC's effort to manipulate data and statistics so as to exclude valid environmental justice communities within the project area, if it were properly drawn. Do not let them get away with it by approving this inefficient, grossly overpriced project that will harm Oregon and Washington, both economically and socially. I vehemently oppose the CRC project in its current form. The CRC project in its current form is unnecessary and it ignores the decrease in traffic and most importantly ignores the will of the people. We want more bridges, more options over the river, save money not spend in a bad economy, we need better schools, better paid teachers, earthquake upgrades for all bridges in Portland not just I-5. We want improved public transportation. Re-working I-5 is the least of our concerns. There is more than one way to fix the congestion on the I-5 bridge. Please do not approve this project and force Oregonians and Washingtonians to pay a 10 billion dollar bill that we the tax payers will have to pay. I want better schools not a big fancy bridge that will simply displace congestion from the Columbia River to the downtown Portland I-84 area. This project does not resolve the bottleneck traffic problem; it just moves it further south. Downtown Portland already has harmful levels of pollution in the air and this project will only exacerbate our air quality. Additionally, this bridge will have the exact same problem in 30 years. Construction will take 10 years. It is not worth it.

Financially the CRC project is not worth it. Ethically what CRC is doing is wrong. The financial, emotional, psychological, physical, and livability impact that will be suffered by HIMHC is disproportionate, highly adverse and appreciably more severe than to the residents of the rest of the project area.

P-073-001 Low income populations, as a group, have poorer health than wealthy communities. As a result of this less sound state of health, they suffer ill health and death from challenges that more healthy populations can tolerate. Ill health and death are significant adverse impacts.

The very old and very young are the segments of society that are most likely to become ill and or die from health challenges that the majority of the population can tolerate.

The HIMHC compounds the fragile health risks of low income as well as those of the very old and the very young. The HIMHC is a high risk group for significant adverse impacts from health challenges. This is a community most likely to suffer appreciably more injury from; expose to toxic substances, decreased air quality, the chronic stress incurred by on-going noise and vibration insults to their known lesser capacity to tolerate such exposure. **This is the type of community most likely to suffer ill health and probable death as a direct consequence of the impact of the CRC project**. Every effort should be made to move every aspect of the CRC project as far away from HIMHC community as possible and to maximize mitigation efforts.

The HIMHC residents now live in a relatively tranquil environment with fresher air from the Columbia air currents. However, polluters on the river and onshore currently harm Hayden Island air quality. Once CRC construction starts, HIMHC's living environment will change dramatically and make their environment one of on-going noise, vibration, and air polluted with particles and toxic substances. Instead of a health supporting, tranquil environment, it will become an environment of on-going, inescapable chronic stress; both psychological as well as in the form of more direct physical health challenges. The combination of on-going mental psychological stress and known physical toxic exposure on a population already at high risk for significant adverse impact to health challenges makes it a foregone conclusion that decrease in well-being, ill health, and probable death will occur in this select population if the CRC project proceeds as planned (stages at Thunderbird hotel). Despite awareness of the illness that will result in the HIMHC as a direct result of CRC construction, the CRC plans would also limit this community's timely access to emergency vehicles during the CRC project. **How can the CRC have such blatant disregard for the lives and well-being of this segment of society?**

The significant adverse impact suffered by the residents of the HIMHC is an obvious predictable consequence. It cannot be claimed to be unforeseen. Knowing the unacceptable significant adverse impact the HIMHC residents will predictably suffer; the onus is on the CRC to earnestly explore other alternatives with less impact on this fragile community. One option

P-073-001

that would seem to minimize the HIMHC exposure is Jim Howell's common sense alternative option. The common sense alternative by Jim Howell is a 6 minute YouTube video, watch it.

Below are known concerns of HIMHC that have been knowingly overlooked. I have been present at CRC Q&A sessions and it disgusted me to watch CRC people answer questions with an evasive and non-responsive answer. It was offensive and it demeaned members of the HIMHC community's valid concerns. Inability to be "plain and concise" in person just shows that CRC, in person as well as in the DEIS and FEIS failed to be "plain and concise" another violation of NEPA. How many times can CRC violate NEPA and still be approved?

P-073-002

A. SAFEWAY CONCERNS

- It is critical for the health of the low income residents of HIMHC to have fresh food available within walking distance. The only store that meets this requirement is the existing Safeway. 30% of HIMHC residents do not drive, 60% are 65 or older, several require mobility assistance (walker/wheelchair) and therefore cannot walk far. Removing the Safeway will have a highly adverse and disproportionate impact on the well-being of HIMHC.

- The alternative grocery stores listed in the FEIS are all several miles away and are not accessible to a non-mobile community. The FEIS states that people with disabilities or mobility limitations that live near Safeway will suffer a greater impact because they will have to travel farther to get fresh food. The projected transportation improvements do not address or acknowledge the financial and physical limitations of this low income community. These alternatives are 4 miles away, which means that an elderly disabled resident will travel roundtrip over 8 miles, heavy bags in hand to gain access to vital resources like fresh vegetable, meats and fruits.

Below are the FEIS listed alternatives that are unacceptable and do not mitigate:

- Cash in Carry is for restaurants and only sells in bulk
- Fred Meyers in Vancouver – 4 miles away and requires residents to pay a toll.
- New Seasons – 3.6 miles = expensive

5

P-073-002

The project has endeavored to avoid the displacement of any business, although it is not possible to do so within the densely developed corridor. The project will continue to look for ways in which impacts can be minimized and avoided. The displacement of Safeway is documented in the FEIS. Mitigation for this impact is governed by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended). The project will suggest that Safeway relocate on Hayden Island, but cannot require them to relocate in any specific location. Relocation decisions are business decisions that will be made by Safeway.

There is currently a Target store being built on the island, and this store will include both groceries and a pharmacy.

P-073-002

- Fred Meyers 3.9 Miles – 4 miles, each way = 8 miles carrying heavy food
- Home delivery= expensive= requires internet, computer, credit card, bank account
- A store equivalent to Safeway, within walking distance of an elderly population must be maintained. Improving vehicle mobility from the island does not help people who depend on walking to get their groceries.

- The FEIS claims that grocery store delivery service is an acceptable mitigation to the loss of Safeway. This alternative presumes the financial resources to be able to afford a computer, the monthly internet fees, a bank account, good credit, a credit card and money to pay for a home delivery fee. This alternative is expensive and completely ignores the financial reality and limitations of HIMHC. This is not an acceptable form of mitigation

- Taking away access to fresh food from a low income community of elderly, disabled residents, and children is a direct assault on the health of HIMHC, a population already at risk. The cost of ill health is the largest drain on U.S. economy. It is clearly not in the best interests of the public to promote ill health, especially to children and elderly citizens. HIMHC will suffer a disproportionate impact compared to other communities specifically because this community is composed primarily of the very young and very old who are the most vulnerable segments of society.

- At the end of section 3.5, under question 2 it states "Does the project affect a resource that is especially important to a low income population" FEIS answered no. The FEIS is wrong. HIMHC residents have continually vocalized concern about losing access to the only on island location for fresh fruit, meats, and veggies; Safeway. The fragile health of HIMHC will suffer a disproportionate impact if denied fresh food. The very young and very old are less able to respond to challenges to their health. The harm ranges from vitamin deficiencies, diminished capacity to healing from surgery, and diminished capacity to fight infections including even the common cold which will in some instances progress to pneumonia and death.

- At the end of 3.5, Question 4 "would the project result in disproportionately high and adverse impacts on a low income population that would be appreciably more severe or greater in magnitude than the impact that would be suffered by non-minority and non-low income populations?" FEIS answered no. FEIS is wrong. The more affluent, eastern side of Hayden Island can get their groceries delivered. The western side is poor. It is well documented that the poor have less vigorous health. Moreover, HIMHC is composed of children and the elderly, which again are the well documented segments of society most at risk from health challenges. This is a population least able to tolerate inability to have access to fresh food. Therefore there is no doubt that HIMHC will have a highly adverse

P-073-002

and suffer a disproportionate impact if their health is further diminished by removing access to fresh foods.

- FEIS lists a Washington Fred Meyer's location as mitigation for the loss of the Safeway. Shopping at this location would force HIMHC residents to travel over 8 miles round trip and pay a toll. Is it unreasonable to expect HIMHC, a low income community to pay a toll every time they need fresh produce and meat.

P-073-003

B. BRIDGE & UTILITIES

- 60% of the residents of HIMHC are 65 or older. In order to avoid a highly adverse and disparate impact against this population the local access bridge must be built in the first phase of the project to ensure efficient emergency access.

  The residents of HIMHC are older, in poorer health in comparison to the general population and thus will have a greater need for rapid access to emergency vehicle medical care. Every second counts for heart and brain injuries. **Any delay in the arrival of medical emergency vehicles will result in permanent injuries and potentially death.** Not only is it morally irresponsible, it is fiscally irresponsible because due to preventable delay in timely access to emergency medical care a greater number of elderly individuals will no longer be able to live independently and will be force to shift to state supported living facilities. This is a hidden cost that must be publicly addressed, in terms of not only dollars, but loss of life, quality of life, and autonomy. Initial construction of the local access bridge to Hayden Island to allow timely rescue and removal by emergencies vehicles is vital to the health and safety of HIMHC. Option A of the LPA, the local access bridge to Hayden Island must be built in the first phase of CRC construction.

- The FEIS included an LPA "option B" which does not provide a local access bridge to Hayden Island. Option B was not included in any alternatives presented in the DEIS and thus excluded the public from discussion and participation regarding the option, contrary to the requirements of NEPA.

- On 10/20/2011 Nancy Body did a question and answer session with HIMHC residents. In this discussion it became alarming clear that LPA Option A is not in any way the committed choice for CRC construction. **It is unacceptable that CRC has not made a commitment on the bridge design when releasing the FEIS**. Giving the public 30 days to comment is abhorrently meaningless when the real decisions are made after the close of the comment period thus eliminating any opportunity for community input on the CRC design. The CRC project is stated to be for the benefit of the public and it is

7

P-073-003

The project is eager to work with emergency service and utility providers as the design for the LPA and the approach to construction is further refined. The project has already made commitments to maintaining 3 through lanes, and to construction-period transit enhancements. The possibility of early construction of the local multimodal bridge will continue to be a consideration by the project as project sequencing is refined. Although it is not appropriate to describe the early construction as mitigation, it is discussed as something we will explore as we further refine construction staging. Specifically Section 2.3.1 of the FEIS states:

> Similarly, the Marine Drive interchange construction would need to be coordinated with construction of the southbound lanes coming from Vancouver. While this interchange can be constructed independently from the work described above, the completion and utilization of the ramp system between Hayden Island and Marine Drive requires the work to occur in the same period. Early construction of the local multimodal bridge between Marine Drive and Hayden Island, so that it can be used as an alternate access route during the remaining construction period, will be analyzed during final design. The interchange reconstruction also needs to occur so that Marine Drive can be elevated, allowing the light rail extension to cross under Marine Drive. The Marine Drive interchange is expected to take a little more than 3 years to construct, including work at the Victory Boulevard interchange.

P-073-003

counterintuitive to ignore and remove the public's ability to participate. The public is footing the bill and their input must be directly and satisfactorily addressed.

- The FEIS failed to inform HIMHC that during construction their vital utilities, such as water, sewer, and electricity will be shut off for indeterminate amounts of time. This reality was not in the DEIS or any other document previous to the release of the FEIS. It is unacceptable that CRC did not explore the potential consequences to a population with fragile health, of elderly residents and children. The loss of these vital utilities, even temporarily could potentially have a dire effect. The onus is on the CRC to explore and then mitigate the shutdown of these utilities. Without knowing the current and foreseeable future medical equipment needs in this population CRC cannot determine if any interruption in utilities can be tolerated by HIMHC.

  Did CRC consider that HIMHC residents might use breath apnea machines, run oxygen tanks, kidney machines for home dialysis, using IV medications (morphine pump, or medicinal pump that needs to stay plugged in), or have babies with SIDS – sudden infant death syndrome? Older people use monitors in case they fall; this signal is weak and needs electricity or phone lines to work effectively.

- The CRC acknowledges in the FEIS that it is "especially aware of the sensitive circumstances on Hayden Island" in regards to the shut off of vital utilities. It is knowable that there will be increased illness and death in the HIMHC community as a direct result of the CRC project; Illness and death that would not necessarily occur in a more typical demographic population. CRC has made no commitment nor any statement at all in the FEIS as to what mitigation will be undertaken by CRC to ensure the health and well-being of HIMHC while their vital utilities are shutoff. CRC has not mentioned any financial responsibility in the FEIS as to any mitigation that will be required to protect this community, such as generators or water tanks. The CRC has acknowledges a highly adverse and disparate impact on HIMHC. NEPA requires mitigation steps be taken. Merely acknowledging the hardship the CRC will place on HIMHC is not mitigation. The FEIS is deficient because it fails to state how it will mitigate against the loss of vital utilities.

- **The FEIS does not acknowledge or quantify the illness and death it will cause in an elderly population, in particular HIMHC, as a direct consequence of the project.**

P-073-004

C. AIR QUALITY MONITORING

- A definitive staging site was **not** selected in the FEIS. The FEIS cannot accurately determine the effects to air quality and health consequences to local residents without

8

P-073-004

The project is considering different contracting methods, and which specific bridges, roadways, etc., will be part of each contract. There are five possible staging areas identified in the FEIS. These staging areas could be used by a contractor, or they may choose their own. This is typical during the planning and NEPA environmental impact assessment stage. A contractor will determine the exact activities that will occur on any of these sites, or any other site to be used for staging or casting. The contractor, working closely with the DOTs, will need to ensure compliance with NEPA and any other applicable federal, state and local regulations.

The project did assess and report the greenhouse gas emissions from the project. The FEIS also provides considerable detail about other emissions and air quality impacts. The air quality evaluation presented in the DEIS assessed how emissions would be expected to change by 2030 and how the project would affect emissions of pollutants regulated by state and federal standards as well as vehicle emissions that are not regulated. Oregon and Washington, as well as the federal government, have established ambient air quality standards for criteria pollutants. These standards are based on human health risks. The DEIS evaluation included an analysis demonstrating that the CRC project would allow the region to retain conformity with state and federal air quality standards for relevant criteria pollutants. See the Air Quality Technical Report for a detailed explanation of the state and federal regulations concerning air quality and the evaluation of how the project complies with relevant air quality regulations. See Section 3.10 of the FEIS for an updated explanation of the pollutants regulated by state and federal law.

The DEIS also evaluated how the project alternatives would affect emissions of mobile source air toxins (MSATs) from I-5 traffic. MSAT emissions from vehicles are not currently regulated. The evaluation in the DEIS found "that future (no-build or build) emissions of all pollutants

P-073-004

specifying where the CRC will be bringing and introducing into the air, water, soil, ect. hazardous substances.

- In the FEIS it says that local and regional air quality standards will be met. The FEIS does **not** address how big of a contributor the CRC will be in greenhouse gas emissions (GHG) emissions and other pollutants. Public participation includes informing the community accurately on the expected emissions of GHG's, carbon monoxide, particulate matter, toxic and hazardous substances and other pollutants that will result from the CRC project.

- The FEIS **failed** to state how much pollution the CRC anticipates releasing into the environment. The FEIS failed to address how much release of pollutants are anticipated. There are no graphs or charts with the real numbers as to expected pollution, contamination, and release of toxins into the environment as a result of CRC construction. There is no description of the worst case scenario of maximum exposure. This information is critical for a low income elderly infirm population.

- **The stated pollution plan in the FEIS is extremely inadequate.** The FEIS failed to take into consideration all pollution and only considered pollution and emissions that come from motor vehicles, deliberately choosing to ignore all other present pollution in the project area. For the local residents of HIMHC the air quality health impact will be directly related to the total pollution level that they are forced to endure. It is therefore critical that the current level of pollution, prior to the initiation of the CRC construction project, be accurately and continuously assessed, posted publicly in a timely manner, and satisfactorily addressed. If the current pollution level is already high then there may not be the available margin to accommodate **any** increase in pollution without extremely adverse and disproportionate consequences to the low income elderly and infirm population at HIMHC.

- **The CRC has not done adequate testing of pollution.** It is critical that accurate levels of exposure to current pollution are assessed as soon as possible. Cumulative impacts are unknowable without first ascertaining the current level of pollution. It is outrageous and unconscionable that the CRC, represented by Nancy Boyd, stated on 10/20/2011 at a meeting with HIMHC residents that the **CRC's position is that there is no value in knowing the total pollution levels the HIMHC residents are subjected and no value in having on-site monitoring of pollution. This is a blatant disregard for the health, well-being, and survival capacity of HIMHC, a low income community.** It is clear that the CRC is not only disinterested but not concerned about the health of HIMHC residents who are currently exposed to significant levels of pollution. To not test the HIMHC community for current levels of pollution is blatant disregard for human life. It is absolutely necessary to provide HIMHC and the public with proper testing. **Proper testing necessarily includes testing all of the project area for current levels of ALL pollution prior to initiation of construction**. Some areas may have high enough levels

9

would be substantially lower than existing emissions for the region and the subareas" (page 3-277). These reductions in emissions are largely the result of on-going reductions in vehicle emissions that will occur with or without the project, and are based on standard assumptions regarding future vehicles and fuel. The anticipated vehicle emission reductions are based largely on regulation-driven improvements in fleet fuel efficiency standards and cleaner gasoline and diesel fuels. Any extraordinary improvements in fleet fuel efficiency or fuels would result in even greater emission reductions.

Projected reductions in vehicle fleet emissions would result in a 25% to 90% reduction in I-5 related criteria pollutant emissions over existing conditions, even with the anticipated growth in population, employment and VMT. In addition, the build alternatives would provide small further reductions in vehicle emissions at the regional level and for most pollutants in each of the subareas along I-5. CO and NOx emissions would be slightly higher with the project than with No-Build (but still lower than existing conditions) in the I-5 subarea between the SR 14 and SR 500 interchanges, as discussed in DEIS Chapter 3 (Section 3.10) and FEIS Chapter 3 (Section 3.10). The updated analysis conducted for the FEIS resulted in very similar findings to those in the DEIS.

Human Health concerns are the basis of many NEPA studies, including those related to air quality. The project has not elected to conduct a door to door survey of respiratory disease in Portland. Only a survey of this type would provide the data needed to make findings specific to the corridor. And, since the project will improve air quality in Portland, there is little need to dedicate the resources for such a survey.

The FEIS contains a summary of the information obtained during preparation of the Hazardous Materials Technical Report. The Report does have some specific information and research regarding potential contaminants for identified sites. However, it is only for sites identified in

P-073-004

that construction in that area is not possible because it would sacrifice human health, well-being and life. HIMHC demands that for their well-being, and for proper evaluation of the environmental impacts, a full and thorough pollution test must be done of ALL current pollutants in the Portland Vancouver project area before construction. Additionally, the pollution levels must be continuously monitored by on-site equipment that is placed in the most polluted areas during construction to ensure that CRC is aware of the levels and can notify the public promptly and based on knowledge from this monitoring equipment take prompt and satisfactory action to protect human life. Until the CRC adequately assessing the entire project area by determining the most polluted locations and placing equipment in those locations it has not done the proper testing to meet the environmental impact requirements.

- The CRC and thus the FEIS cannot state the project will not exceed state and federal air quality standards until it does a thorough evaluation of the current air quality. Vehicle emissions combine with already airborne pollution to create compounded effects. The CRC cannot adequately evaluate air quality by only considering vehicle emissions in a vacuum. Properly evaluation of air quality includes an assessment of the entirety of existing and potential pollutants in the air. The impact on HIMHC, a low income elderly population, including many already in poor health, cannot be accurately determined without knowing the total level of pollution; therefore it is critical that the total of pollution is clearly and specifically addressed in a quantifiable manner. It was not.

- The CRC failed to adequately assess air quality because it did not specifically address the levels tolerable to an elderly or youthful population. HIMHC is home to over 100 children and 60% of the residents of HIMHC are at least 65 years old. The young and the old have diminished capability to tolerate threats to their health, especially in a low income population. The members of HIMHC is a low income community and live within 100 feet of Thunderbird hotel. Clearly any decrease in air quality will have a disproportionately adverse impact on children and an elderly population. The demographics of HIMHC were not specifically evaluated in the FEIS and this is very concerning when one of the three potential staging grounds is the Thunderbird Hotel.

- Elderly individuals and children exposed to construction, especially HIMHC which is a low-income community, will be adversely and disproportionately impacted given their diminished health capacity and thus suffer more severe health consequence than a community with a more typical age demographic. The CRC failed to analyze and the FEIS failed to state the expected health consequences of the CRC project on local communities. It is predictable that there will be increased illness and death in this low income population of children and the elderly when they are subjected to many years of decreased air quality, as well as the well documented significant adverse health consequences of chronic stress; stress which will be unavoidable living next to a major construction site. The Thunderbird hotel is only 100 feet from HIMHC community. Given the low income status of HIMHC, this group meets the environmental justice test of highly adverse and disproportionate impact. The FEIS failed to state and the CRC failed to analyze how many additional deaths are anticipated as a result of the CRC

regulatory databases, not every property within the corridor. The scope of an environmental impact statement for a large corridor project does not include a specific on-site investigation of every single property; it generally looks at summary information for the entire corridor (i.e., regulatory database, aerial photos, Sanborn maps, and windshield survey) to provide an overview of potential issues and how they could impact the various alternatives. The FEIS recommends environmental site assessments in any case of acquisition or property use, but stops at identifying specific issues on each property because of the nature of the changing design and the scope for HazMat within the FEIS. Site assessments will begin following the Record of Decision. And the project will address any contaminants in strict accordance with federal, state, and local regulations.

P-073-004

project. FEIS failed to inform Oregonians and Washingtonians of how many people will die as a direct result of the CRC project. Apparently the CRC considers the excess deaths in low income populations are considered acceptable. **We demand acknowledgment of these disproportionate impacts that are highly adverse and give HIMHC the environmental justice status is rightly deserves.**

- Low income elderly people and children have a lesser capacity to tolerate any insult to their health and wellbeing. Pollution which a healthy adult "may" tolerate has the significant potential to have highly adverse, devastating consequences to very young and very old residents of the HIMHC. The CRC either did not take this into consideration when listing the Thunderbird as a potential staging site, or does not value the health and life of low income populations.

- There is no CRC data in the FEIS that proves that there are no long-term air quality impacts as a result of the project other than a reference to a Chicago study. The FEIS used the Chicago study to show air quality standards will not be exceeded during CRC construction. The FEIS failed to state exactly how it took into consideration the differences in environment, weather, topography, air movement, as well as other existing pollutants when comparing these two very different locations, Portland/Vancouver and Chicago. HIMHC and the general public cannot be properly informed nor have a true opportunity to participate without valid data regarding long term air quality impacts.

- The FEIS failed to meet the NEPA requirement of explaining the project in plain and concise language. It is unclear what constitutes the CRC's pollution control plan. The FEIS does not state the percentage of pollution the CRC expects to leak into the environment. The public needs to be informed of the expected leaks and exposure of pollution to the local environment. HIMHC, being a low income community of very young and very old residents who are especially vulnerable to harm to their health must be properly informed of the risks CRC is exposing them to.

- The FEIS failed to adequately explain the specifications for adequate containment of dust. The FEIS failed to state how much lack of containment of dust is acceptable. There is no chart, graph or summary in the FEIS that explains what surrounding communities will be inhaling, dust or other harmful substance in addition to dust. The CRC failed to investigate and failed to inform Oregonians and Washingtonians about the possible pollution, toxins or hazardous substances local residents will inhale as a direct result of dust from construction. HIMHC is directly downwind from the Thunderbird hotel and will suffer a disproportionate impact due its proximity and the effects on this community will be highly adverse given their fragile health.

P-073-004

- There is no study on dust that shows the potential health consequences for low income populations, especially children and the elderly, who will be subjected to and inhale uncontained dust. Uncontrolled dust due to construction is a certainty. The study that should have been done would assess consequences based on the maximum possible dust young and elderly populations could be exposed to as well as an analysis of what that dust might contain; addressing toxins already present that will be made airborne and therefore more toxic to the population, as well as additional pollution created by the construction. There are residents of HIMHC with chronic lung disease and asthma who are particularly sensitive to air quality. To date CRC has done no investigation of the current health, in particular respiratory limitation of the current residents. This is a blatant disregard for the health and well-being of a low income community.

- The FEIS failed to state clearly, or in any detail, what is "prompt removal" of dust under the dust control plan. The FEIS also failed to state what kind of chemicals will be used to control the dust. HIMHC has over 100 children and many elderly residents. This community is vulnerable and lack of care in choice of chemicals used to control dust could have dire effects.

- Some of the buildings to be demolished are older than 1980 and are likely to contain asbestos, lead, or other toxic substances in them. The FEIS failed to explain in adequate detail how vulnerable populations, such as low income children and elderly residents of HIMHC, will be protected from this possible exposure. CRC did not analyze how effective the protective steps will actually be for vulnerable local residents. The FEIS does not state the known or suspected percentage of contaminants that will be released into the local environment initiated by the CRC demolition. The CRC project will cause HIMHC harmful health consequences. Who will pay the medical bills for local residents who get cancer as a result of the release of asbestos from this demolition? Who will pay for the hospitalization for HIMHC residents who have asthma attacks precipitated by CRC construction?

- Under the transportation conformity rules (40 CFR 93.123 (c)(5)), carbon monoxide and particulate matter hot-spot analyses are not required to consider construction-related activities which cause temporary increases in emissions. This means any construction that lasts 5 years or less. A hot-spot analysis was not done at the potential staging sites. This is unacceptable given the immediate proximity of HIMHC, a low income community of the very young and very old, who would be less able to tolerate expose to carbon monoxide and particulate matter. HIMHC challenges this exception and demands that the health and safety of local residents requires a carbon monoxide and particulate matter hot-stop analysis be performed and in particular include focused evaluation of the impact in the HIMHC local area.

- It is well known that construction projects rarely conclude within the projected time limits. Given the strong possibility that the staging area could last longer than 5 years,

P-073-004

there should be a carbon monoxide and particulate matter analysis performed at each potential staging area. The lack of this testing is especially mischievous when the FEIS acknowledges that hot-spot testing has already been done as certain locations.

- CRC has not considered the pre-existing hazardous substances already present in the soil, ground water, and environment that will become airborne during construction at the Thunderbird hotel and the project area in general. The HIMHC is low income population directly downwind from this staging area. The children and elderly in this community are particularly susceptible to the adverse impact of toxic substances. This mandates further testing of the staging ground because without knowing what is there how will CRC adequately protect this at risk population.

- Knowing the disproportionate detrimental impact of increased compounded pollution on the low income elderly community HIMHC, the CRC needs to either clean up the Thunderbird Hotel site prior to construction or to use a different site distant from a population with a disproportionate possibility of a high adverse consequence.

P-073-005

D. NOISE/VIBRATION:

- The FEIS states that noise dampening walls will be installed in Vancouver. The FEIS does not state that Portland, in specific Hayden Island, and in particular HIMHC will be protected by a noise wall or any form of sound dampening. It is necessary for specific, adequate noise mitigation on Hayden Island to protect the HIMHC community. The on-going and chronic noise and vibration is going to be a major cause of chronic stress for HIMHC community. The significant adverse effects to health, including death, as a direct consequence of chronic stress are well-known. This impact is highly adverse and disproportionate as compared to the general project area. HIMHC, an elderly population, many in frail health, have a much lesser capability to withstand the health consequences of chronic stress which undoubtedly will result in illness, and will contribute to injuries and deaths. The chronic stress arising as a direct result of CRC construction would be less likely to result in illness, injuries, and death if done at a location with more typical demographics. It is necessary for the health and well-being of HIMHC that an adequate noise wall is built, in addition to other appropriate noise mitigation measures. This is especially true if the Thunderbird Hotel is used as a staging ground given that HIMHC is right next door.

- Knowing the highly adverse consequences to HIMHC if the Thunderbird Hotel is chosen as a staging site, it is unacceptable to even consider the Thunderbird Hotel site as a potential staging area. To use the Thunderbird Hotel as a staging area is blatant disregard for the health and well-being of HIMHC, a low income elderly community. To use the

P-073-005

The noise study in the FEIS was performed in accordance with regulations from the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Oregon Department of Transportation (ODOT), and the Washington State Department of Transportation (WSDOT). The regulations are designed to protect the health and welfare of communities with maximum allowable noise levels from transportation noise. For highway noise in Oregon, the criteria for consideration of noise abatement is a peak hour Leq of 65 dBA. A detailed traffic noise analysis was performed for the nearest homes at the HIMHC represented by receivers PD-9 and PD-10. Under the full Build Alternatives, the future noise levels are predicted at 61 dBA Leq, an increase of 4 to 5 dB over the current levels of 56 to 57 dBA. Therefore the future noise levels are within the regulatory criteria and no noise abatement measures are required. Noise levels in Vancouver, where noise abatement is recommended, range from 66 to 77 dBA Leq or more; therefore, noise barriers are well justified. This is because the residences are as close as 50 feet from the highway, while the residences at the HIMHC are over 500 feet from the new bridge. Also, the noise impact criteria does not differentiate residences based on age, race, religion, or other demographics. All residences are treated equally under the noise impact criteria.

The Noise and Vibration Technical Report, an Appendix of the FEIS, contains a section that is specific to the potential noise related to construction. See Section 5.2, Construction Activities and Section 6.3, Proposed Mitigation for Adverse Effects during Construction. Also, the governing criteria for noise related to construction in the City of Portland can be found in City of Portland Municipal Code Title 18, Noise Control. Chapter 18.10.060 provides the criteria for construction noise. Under the City's noise control ordinance, virtually all major construction projects require a noise variance if work is planned during nighttime hours or on Sundays. Daytime construction activities are limited to 85 dBA at 50 feet

P-073-005

Thunderbird Hotel site as a staging area is tantamount to expressing no regard for the value of lives of low income individuals.

- Vibration and noise, for a prolonged duration is harmful to health. The CRC project would require at least one large site to stage equipment, materials, and a large site for fabricating segments of the new bridges. The Thunderbird Hotel is a potential staging ground and is situated immediately adjacent to HIMHC, a low income community. This proximity exposes HIMHC to the highly adverse and disproportionate impacts of stress as a result of noise and vibration caused by CRC construction. Predictably on-going exposure to this noise and vibration will result in the well documented, numerous, highly adverse health consequences associated with suffering chronic stress.

- The CRC failed to do an analysis on noise and vibration that took into account the decreased health and well-being of the disadvantaged elderly residents of HIMHC community. Proper analysis must specifically investigate and address the effects of noise and vibration, and resulting chronic stress on the HIMHC, given that they will be subjected to prolonged noise pollution.

- The FEIS states that HIMHC will not be subjected to noise and vibration pollution in a disproportion and highly adverse manner. This conclusion is not supported. The CRC failed to specifically detail, with supporting studies, how subjection to prolonged noise pollution would NOT have a highly adverse and disproportionate impact on a low income elderly population.

- The DEQ Noise Source Standards could be exceeded at locations within the adjacent neighborhood due to some staging activities, particular equipment used, and the location of the activities on the staging site. If the Thunderbird hotel is selected for staging activities, additional construction noise monitoring and mitigation measures, beyond those discussed in Section 3.11.5, could be required. There should be additional mitigating measures.

- It is unclear in the FEIS if the CRC has done any studies that evaluate the long-term effects of noise and vibration generated by construction at a staging ground. HIMHC is next to the Thunderbird Hotel, a potential site for noise and vibration pollution. A study evaluating the long-term effects of noise and vibration, in particular the impact on a low income elderly population and in particular the impact on manufactured homes must be done. The CRC's FEIS is incomplete without this evaluation.

14

with the exception of trucks (see Section 18.10.020), pile drivers, pavement breakers, scrapers, concrete saws, and rock drills. The contractor would be required to meet the City of Portland Municipal Code Title 18, Noise Control, if the contractor elects to use the site for a staging area. Section 5.2.2 and Section 6.3.2 of the Noise and Vibration Technical Report provide information on construction vibration. Although there are no City of Portland, State of Oregon, or federal regulations related to construction vibration, the contract specification will have a section that would likely limit the contractor to a maximum vibration level. The majority of major vibration-producing activities will be more than 300 feet from the nearest home at the HIMHC. Therefore, it is unlikely that vibration levels at that distance will be of sufficient magnitude to result in any structural issues, including structural issues for manufactured homes.

P-073-005

- Washington requires that there be a vibration study done evaluating possible impacts on residents from noise and vibration. Even if Oregon law doesn't require it, this should be done so that residents of HIMHC can know the personal costs of having the staging ground right by their doorstep. These costs include harm to physical and psychological health, loss to personal property in and adjacent to the home, vibration damage of the physical structure of homes and out buildings (garage/shed/etc.), and disruption of utilities due to damage to utility pipes resulting from construction related vibration. The CRC cannot claim a lack of knowledge of these financial costs when HIMHC residents have continually informed the CRC of this risk that is already a reality to HIMHC residents due to construction at the Mall. Clearly the proximity of the Thunderbird Hotel staging ground and the construction of the bridge itself, are much closer than the Mall and will result in much greater impacts.

- In the FEIS it acknowledges that HIMHC is concerned about the effects of having a staging area construction site only 100 feet away from their homes, however the only response given is "the project has organized many meetings to hear and address these concerns." These concerns have not been addressed. As an Oregonian, angry at this oversight I demand that specific steps, publicly available, are taken to protect local residents within the CRC project area, in particular HIMHC residents, against harm caused by noise and vibration resulted from CRC construction.

- HIMHC is a manufactured home community; these homes have less insulation and presumably less dampening of noise and vibration pollution. There has not been an assessment of impact of noise and vibration pollution, like pile driving on these types of homes. This must be evaluated to accurately assess the impacts on the health of the residents of HIMHC.

- Along with having less insulation, these homes are not on traditional foundations which will subject the homes to more vibration

- The low income residents of HIMHC will be subjected to a higher level of noise even inside their own homes than would residents of non-manufactured homes. This actual level of noise, which will cause injuries to HIMHC, needs to be determined, taking into account the highly adverse consequences suffered by an elderly community who will be at home all day every day, subjected to unrelenting noise and vibration, in addition to decreased air quality and increased chronic stress. This environment increases the likelihood of injuries, in particular hip fractures given that HIMHC is a low income elderly population. The incidents of deaths within 6 months of hip fractures in an elderly population are high. Hip fractures and death are highly adverse and disproportion impacts that only the HIMHC will suffer, given their demographics and proximity to the CRC project.

P-073-006

E. HAZERDOUS MATERIALS

- No action is being taken to clean up the Thunderbird hotel despite the acknowledgement in the FEIS that this location was a former landfill and the site for a automotive service station. The FEIS also admits that due to the thunderbird's previous use it is known or suspected that this location has pre-existing contamination of soil and groundwater. The FEIS has not done any testing on this site to determine the extent of the contamination of soil and ground water. The toxins in the ground will become airborne as soon as construction starts and HIMHC will be disproportionately exposed to these toxins mixed with dust. HIMHC is only 100 feet away from this building which means that over 100 children and hundreds of elderly residents will inhale this compounded pollution of unknown toxicity to the determent of their health.

- The CRC's stated preferred alternative, the LPA, exposes the project area to higher levels of risk by choosing an alternative that requires more hazardous materials sites than other alternatives. This means that residents within the project area, specifically HIMHC will bear the brunt of greater exposure to more toxins.

- **The CRC has made no commitment to clean up the project area after the bridge is constructed.** This is very concerning given the fact that the CRC will create at least three hazardous materials sites. In addition to adding to pollution will re-expose local residents, in particular HIMHC, to existing toxins, hazardous substances, and pollution that is currently in the ground, soil and water.

- **The CRC did not test the project area for soil contamination thus the CRC will not know how much pollution at the end of the project is a result of building the bridge**. The CRC needs to test the soil and water before constructing the bridge as well as post construction and needs to make a commitment to clean up and undo the contamination CRC will cause while building the bridge. This is especially important for residents in the project area, namely HIMHC whose ground water and soil will be disproportionately impacted.

- The FEIS did not make any statement as to what precautions will be taken to stop soil contamination from reaching groundwater. Water is an extremely valuable resource and every precaution should be made to protect the Columbia River and ground water in the project area. The HIMHC, being directly next to a staging area are extremely vulnerable to any contamination to soil and water.

- **The Thunderbird Hotel should not be considered as a staging site** when there are already seven sites on Hayden Island that have moderate risk of containing and releasing hazardous substances. The Thunderbird hotel additionally should not be considered a staging site since it already has a known risk for containing hazardous substances that will be released during construction if this site is chosen. Moreover, to use the

P-073-006

Please see the response to comment P-073-004. The project will complete a full assessment of the environmental conditions after the Record of Decision and once the property owners grant the project rights of entry. If contaminants are found, the project will handle these in compliance with local, state, and federal regulations.

P-073-006

Thunderbird Hotel site, will have a highly adverse and disproportionate impact on HIMHC, given that they are downwind, are low income, and have children and elderly residents who will have the least capability to withstand this threat to their health and well-being.

- The FEIS failed to mention what kinds of pollution, contamination, and spills of hazardous substances are possible in the project area during construction. Even a remotely possibility is of concern to HIMHC which is a low income community that has a high risk population of the very young and very old which have a limited ability to tolerate any threat to their health.

- The FEIS failed to mention any analysis that was done on the Thunderbird Hotel for asbestos, lead or other toxic substances. HIMHC is directly next to and downwind from the Thunderbird Hotel. Any substances in this building that become airborne during deconstruction will enter their community, their homes, their bodies, and their food. HIMHC is a population of very young and old that will without a doubt suffer a highly adverse impact from inhaling these hazardous toxins. This harm is disproportionate to the rest of the project area as well as disproportionate to what would be experienced by a more typical demographic.

- The FEIS failed to state the exact locations of the 23 properties that are older than 1980 being demolished and most likely contain asbestos and lead. The CRC project has also failed to inform local residents around these locations who will be exposed to these hazardous substances during demolition. One of the potential locations is the Thunderbird Hotel, which is situated next to HIMHC. HIMHC has a right to know what they will be exposed to during deconstruction of this hotel as well as other sites.

- The FEIS failed to state how big the staging area will be at Thunderbird Hotel. The FEIS did not acknowledge how much area will be disturbed at this location. If the staging area is at Thunderbird Hotel and disturbs less than 1 acre and does not discharge storm-water to surface water then the NPDES (national pollutant discharge elimination system) requirements will not be met. For the well-being of HIMHC, this is unacceptable and all permits required under NPDES need to be obtained whether or not the Thunderbird staging area disturbs at least 1 acre or discharges storm-water to surface water.

P-073-007

F. ENVIRONMENTAL JUSTICE

- The FEIS in inadequate because it fails to recognize the Hayden Island Manufactured Home Community (HIMHC) as a low income environmental justice community,

17

P-073-007

Please see response to P-073-001. The CRC recognizes that there are low income and minority households on Hayden Island. The implementing federal and state guidelines on Environmental Justice have and will continue to guide the project's consideration of, outreach to, and mitigation of impacts for these households.

P-073-007

therefore depriving the residents of the proper Environmental Justice Analysis required by NEPA.

- CRC examined income levels on Hayden Island by using census tract data instead of using the more appropriate block group data. The methodology and unit of analysis used to investigate the possibility of disproportionately impacted low income and minority groups was block group data with the exception of determining low income status in Portland. The use of census tracks instead of block group data when determining low income status in Portland effectively masked the actual presence of an environmental justice community.

- The FEIS wants the public to believe that Hayden Island is not low income; only 9% of the residents qualify under the federal poverty line. East Hayden Island is wealthy. West Hayden Island has a manufacture home community, HIMHC, with over 100 children and mostly elderly residents living on social security, and is undeniable a low income community. The financial reality of each side of this island is drastically different but anyone reading the FEIS would not know this truth. HIMHC's low income status that was covered up by the FEIS has significant consequences for HIMHC because lower income populations tend to have poorer health than more wealthy communities. The effects of CRC construction will have a disproportionate and highly adverse impact on low income children and elderly residents who have less capability to tolerate challenges to their health without dire consequences and lack the financial resources to personally mitigate harm resulting from CRC construction.

- **Through public participation the residents of HIMHC made it clear that their community was EJ and was being overlooked, CRC cannot claim the methodology used was a simple oversight.**

- CRC has failed to use a consistent methodology when identifying low-income and minority communities who would be disproportionately impacted. The use of inconsistent methodologies is suspicious and gives the appearance that CRC intentionally used a different methodology solely for determining low income status in Portlanders with the goal of denying HIMHC their rightful status as an environmental justice community. Using census tracks effectively denied, ignored, and took advantage of HIMHC, a low income elderly population.

- We are all aware that HIMHC community has been targeted due to their low income status. The project staging area was not, and would not be considered in an affluent community like the eastern side of Hayden Island. In the United States of America it is

P-073-007

morally reprehensible to try and hide HIMHC's environmental justice status, a goal that is required by presidential executive order 12898. By using a methodology that would hide their low income status CRC has violated NEPA. Knowing increased death will result in a poor elderly community, where death would not occur in a wealthier and healthier community, CRC has essentially takes the position that the lives of the poor have no value. If this is the position of the CRC it should be stated openly. Value of life should not be measured by socio-economic status.

- The cost of living varies from state to state/city to city, it is higher in OR and WA than many other states and using the federal poverty line covers up low income communities in a state with a higher cost of living. The methodology used by the CRC in determining the demographic characteristic of the community is invalid and masks the true nature of the community as significantly low-income relative to the City and County median household income.

- The CRC has failed to accurately determine low income communities given the outdated data used. Since 2000, unemployment has doubled, availability of jobs has decreased, and the economy is significantly depressed. Using outdated statistical information overstates the current financial reality of HIMHC residents. This is unacceptable given that the CRC surveyed some communities for income levels but did not do so for HIMHC, who continually voiced concern of being overlooked as a low income environmental justice community. The limited date CRC chose to collect, using 10,000.00 increments, effectively masked HIMHC's environmental justice status by forcing residents to claim a higher income bracket that does not accurately reflect financial reality. HIMHC has 1,300 residents which include over 100 children; it would not have been over burdensome to survey the actual income of this community. If such a survey would have been done HIMHC would be considered an environmental justice community.

- One of the aforementioned objectives is to specifically target minority, low-income, and limited English-speaking populations within the project area for stakeholder outreach and feedback. Stakeholders that have been identified are;

Low-income residents, minorities, and people speaking limited English (Spanish, Russian, Vietnamese), as identified in the 2005 demographic analysis for the Bridge Influence Area. . In the FEIS the CRC states that all NEPA requirements have been met or exceeded for public involvement, including **Executive Orders 12898 and 12948, which require each federal agency to make achieving environmental justice part of its mission "by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on**

P-073-007 **minority populations and low-income populations."** If this is the case, then shouldn't block group date been used on Hayden Island because of the income disparity that exists?

P-073-008 **G. ADDITIONAL ISSUES**

- Jim Howell's Common Sense Alternative was never considered as an alternative in the DEIS or FEIS. This alternative projected to cost half as much as the LPA, 1.8 billion instead of 3.6 billion. This is a significant difference given that the CRC project will actually cost 10 billion once all promissory notes and debts are paid. It is unacceptable that the CRC did not make a good faith effort to consider all alternatives especially since it is the tax payers who will bear the brunt of this debt.

- The CRC failed to consider Jim Howell's CSA which should have been considered because CSA will cost half as much, would not cause a 5-10 year increase in traffic and disruption on I-5 and would not take away the Safeway on Hayden Island, a vital resource for a low income community. Additionally, using this alternative does not focus on an enlargement and shift westward of the I-5 bridge and therefore would not have a highly adverse and disproportionate impact on the low income elderly HIMHC, a community least able to tolerate the effects of CRC construction without severe illness and death.

- The CRC Task Force voted on the LPA before looking at over 15,000 public comments. This is a violation of NEPA which requires public participation. Asking for comments is not enough; the CRC must additionally thoroughly read and respond adequately to these comments to meet public participation requirements.

- It is unacceptable that METRO preapproved the FEIS before it came out to the public. This again is a violation of NEPA because METRO approved the CRC project without even considering public comments and thus did not allow public participation.

- NEPA requires that the DEIS and FEIS be "plain and concise." The average person that has no technical training or special degree will not be able to read the FEIS and understand what this document means. The document as a whole is not plain or concise. The FEIS is not written in plain language that helps a reader understand the FEIS as a whole.

P-073-008

Many different options for addressing the project's Purpose and Need were evaluated in a screening process prior to the development and evaluation of the alternatives in the DEIS. Options eliminated through the screening process included a new corridor crossing over the Columbia River (in addition to I-5 and I-205), an arterial crossing between Hayden Island and downtown Vancouver, a tunnel under the Columbia River, and various modes of transit other than light rail and bus rapid transit. Section 2.5 of the DEIS explains why a third corridor, arterial crossing of the Columbia River, and several transit modes evaluated in screening were dropped from further consideration because they did not meet the Purpose and Need. For a general description of the screening process see Chapter 2 (Section 2.7) of the FEIS. It should be noted that every proposal received from the public was considered, and many of the proposals that were dropped from further consideration included elements that helped shape the alternatives in the DEIS.

The Task Force heard testimony and was provided written public comments prior to their recommendation on the locally preferred alternative. The Task Force was a very important advisory group but was not a decision-making group. Their recommendation on the LPA was considered part of the input the project and decision-makers received during the DEIS comment period. Metro approved the FEIS which is not the same as approving the project. The preferences for a replacement crossing and for light rail transit were identified by all six local agencies. Only the agencies in Vancouver—C-TRAN, the City of Vancouver, and RTC—specified a preferred Vancouver light rail terminus. As part of this process, the two regional transportation planning agencies, Metro and RTC, adopted the LPA into their Regional Transportation Plan and Metropolitan Transportation Plan, respectively, in late summer 2008 (Metro 08-3960B; RTC 07-08-10). The CRC project is in the Oregon 2010-2013 Statewide Transportation Improvement Program (STIP), the draft 2012-2015 Oregon STIP, and the Washington 2011-2014 STIP.

P-073-009

CONCLUSION

As a resident of Portland I find it alarming that such a vulnerable community, HIMHC, is being treated with such disregard. This offends me on an individual level, as a human being, and as a citizen of the United States of America. This poor community is being ignored, a sheep thrown to wolves. It is unethical to put a construction site within a stone's throw of a community who will be devastatingly harmed by the well documented severe health consequences; including death caused by chronic stress, unnecessary injuries (hip fractures), increased asthma attacks, difficulty breathing, as well as dust, pollution, leaking chemicals, air borne asbestos/lead, particulate matter from diesel fuel, soil contamination, and water contamination, this list is not exhaustive. Thunderbird Hotel will end up a super fund site because CRC feels free to add to existing pollution without any semblance of responsibility to clean up their mess or the known pre-existing pollution at Thunderbird which will be compounded with new pollution caused by CRC construction.

- Do not let CRC overlook existing and valid environmental justice communities, including HIMHC. HIMHC deserves environmental justice status, and this is not the only group overlooked.
- The Thunderbird Hotel should be removed as an option for a construction staging ground.
- CRC should not be able to let a construction company decide where to place a staging ground in order to pass the buck and blame a private party instead of the real culprit the CRC.
- Nancy Body admitted on 10/20/2011 "there is so much still unknown." How dare the CRC release the FEIS with so many contingencies unknown.

Make CRC go back to the drawing board, be accountable to the public and make actual final decisions like; (1) LPA option A or B, (2) where exactly will the construction sites be, (3) what is the actual total pollution level, (4) including all existing pollutants in the air, not arbitrarily limiting it to vehicle emissions in the project area, (5) determine if we are putting too much pollution into one area, (6) is the project, as currently designed, truly addressing the problem and offering a progressive solution, (7) how much will the tax payers actually have to pay 4 billion or 10 billion, (8) admit HIMHC is an EJ community, (9) keep the Safeway, (10) consider building a new bridge and only upgrade I-5 for earthquake safety, (11) enhance public transportation, put that 4 billion towards education instead of a bridge. RESPECT the voice of the public. Leave I-5 alone.

21

The adoption of the LPA by these local agencies does not represent a formal decision by the federal agencies leading the NEPA process or any federal funding commitment.

The FEIS provides a comprehensive and plainly worded description of the project, the environmental impacts, and the proposed mitigation. It has many details specific to many environmental disciplines. In addition to the document itself, the project has produced fact sheets, an interactive website, and has conducted an extensive outreach program to communicate the findings to the public. Multiple methods have been used to engage the public so as to address the needs of a wide variety of people and the project decision-making process. Examples include workshops with facilitated small-group discussions, open houses where participants can talk one-on-one with staff, public hearings, presentations and discussion at community and neighborhood-sponsored meetings, often at the group's request, and advisory group meetings where CRC seeks recommendations from a citizen committee. These events and meetings have taken place at a variety of locations, days of the week and times of the day to meet the needs of the entire community. For more information on the project's public outreach, please see Appendix B of the FEIS.

P-073-009

Please refer to the detailed responses provided to Ms. Meunier's specific comments, above.

P-073-009

After reading the FEIS I personally feel that CRC should start over. They did a very poor job, CRC over looked important environmental concerns, lied to the community, misrepresented themselves and their intentions, have not made a valid effort to protect minorities and the poor (low income communities) or endangered species. The CRC is taking away over 60 million in annual revenue from Hayden Island, in a bad economy this is a very poor decision. CRC is forcing 643 people onto unemployment benefits, another expense put on the tax payers bill. Do not let the CRC continue to harm Oregon.

Respectfully,

Concerned Oregonian

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P-073-010

HIMHC – Hayden Island Manufactured Home Community – on western Hayden Island
EJ – Environmental Justice Community
FEIS – Final Environmental Impact Statement
CRC – Columbia River Crossing
NEPA – National Environmental Policy Act
EO - Presidential Executive Order 12898
LPA – Locally Preferred Alternative
GHG – Green House Gases
Hot Spot – testing for carbon monoxide and particulate matter
NPDES – National Pollutant Discharge Elimination System

As a resident of Portland it is unavoidably clear to me that Hayden Island Manufactured Home Community (HIMHC) qualifies as an environmental justice (EJ) community. HIMHC is a low income community, predominately composed of elderly residents on social security as well as approximately 100 children. The methodology used by the CRC to determine the demographic characteristic of HIMHC was undeniably different from the rest of the areas evaluated by the CRC. CRC intentionally chose a different methodology when looking for low income in Oregon (census tracks) than in Vancouver (block groups). Interestingly, CRC used block group data when looking to see if minorities were disproportionately impacted in both Oregon and Washington. It seems that CRC uses whatever methodology gives the desired results.

Executive Orders 12898 and 12948, requires each federal agency to make achieving environmental justice part of its mission "by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

Based on EO 12898 and NEPA requirements the CRC is obligated to determine low income and minority populations within the project area that will be disproportionately and highly adversely affected. Low income and minorities populations tend to cluster. The sample size used to determine low income or minority populations, if constructed to include only a portion of the population concerned or made sufficiently large to include non-pertinent populations, will deliberately obscure the identification of a true environmental justice community. The use of census track data instead of block group data on Hayden Island gives the appearance of a blatant effort by the CRC to mask what is undoubtedly an environmental justice community, HIMHC, within the project area.

P-073-010

Please see responses to comments P-073-001 to P-073-009 above.

P-073-010

The CRC's arbitrarily narrowed drawing of the project boundaries again gives the appearance of a deliberate effort to exclude additional environmental justice communities that are well-known to be present within the North Portland area. Moreover, clearly the environmental impact of this project will not only effect the very narrowly CRC identified corridor/parameters, but will further extend into the North Portland area that is home to minority and low income populations.

It is my stance that NEPA requires CRC to make a good faith effort to meet the requirements of EO 12898. This requires CRC to accurately evaluate the project area by not only considering direct impacts of construction on the immediate surrounding area but also to consider air quality impacts which will affect a greater area. North Portland which is currently surrounded by the filth of highway pollution, pollution from waste facilities, toxins from industrial facilities, I-205 which is home to a growing minority population as they are being economically forced from inner NE Portland, I-84 which is already heavily congested will have even greater congestion as a result of this project, are being completely excluded from the DEIS and FEIS when evaluating CRC's environmental impact. **This is gerrymandering.**

Using a census track to determine low income in Oregon instead of block group data, which was used for all other EJ testing, shows a conscious intent on CRC's part to masks the true nature of the HIMHC community. Portland has a higher cost of living than some other states, so using the federal poverty line is absolutely inappropriate as a comparison. HIMHC is significantly low-income relative to the City and County median household income. Even using the inapplicable comparison of the federal poverty line, if a proper income survey was done at HIMHC it would have been unavoidably clear that HIMHC is a low income community qualifying for environmental justice status. HIMHC was not surveyed, although such a survey was done in other communities. Being a low income community means that HIMHC deserves environmental justice (EJ) status under NEPA. The FEIS failed to identify HIMHC as an environmental justice community. **This is gerrymandering**. HIMHC is due EJ status and all the protections that come with it. Until CRC makes HIMHC an EJ community it is in clear violation of NEPA requirements.

The DEIS and FEIS exemplify CRC's effort to manipulate data and statistics so as to exclude valid environmental justice communities within the project area, if it were properly

P-073-010

drawn. Do not let them get away with it by approving this inefficient, grossly overpriced project that will harm Oregon and Washington, both economically and socially. I vehemently oppose the CRC project in its current form. The CRC project in its current form is unnecessary and it ignores the decrease in traffic and most importantly ignores the will of the people. We want more bridges, more options over the river, save money not spend in a bad economy, we need better schools, better paid teachers, earthquake upgrades for all bridges in Portland not just I-5. We want improved public transportation. Re-working I-5 is the least of our concerns. There is more than one way to fix the congestion on the I-5 bridge. Please do not approve this project and force Oregonians and Washingtonians to pay a 10 billion dollar bill that we the tax payers will have to pay. I want better schools not a big fancy bridge that will simply displace congestion from the Columbia River to the downtown Portland I-84 area. This project does not resolve the bottleneck traffic problem; it just moves it further south. Downtown Portland already has harmful levels of pollution in the air and this project will only exacerbate our air quality. Additionally, this bridge will have the exact same problem in 30 years. Construction will take 10 years. It is not worth it.

Financially the CRC project is not worth it. Ethically what CRC is doing is wrong. The financial, emotional, psychological, physical, and livability impact that will be suffered by HIMHC is disproportionate, highly adverse and appreciably more severe than to the residents of the rest of the project area.

- Low income populations, as a group, have poorer health than wealthy communities. As a result of this less sound state of health, they suffer ill health and death from challenges that more healthy populations can tolerate. Ill health and death are significant adverse impacts.
- The very old and very young are the segments of society that are most likely to become ill and or die from health challenges that the majority of the population can tolerate.

The HIMHC compounds the fragile health risks of low income as well as those of the very old and the very young. The HIMHC is a high risk group for significant adverse impacts from health challenges. This is a community most likely to suffer appreciably more injury from; expose to toxic substances, decreased air quality, the chronic stress incurred by on-going noise and vibration insults to their known lesser capacity to tolerate such exposure. **This is the type of community most likely to suffer ill health and probable death as a direct consequence of**

P-073-010

the impact of the CRC project. Every effort should be made to move every aspect of the CRC project as far away from HIMHC community as possible and to maximize mitigation efforts.

The HIMHC residents now live in a relatively tranquil environment with fresher air from the Columbia air currents. However, polluters on the river and onshore currently harm Hayden Island air quality. Once CRC construction starts, HIMHC's living environment will change dramatically and make their environment one of on-going noise, vibration, and air polluted with particles and toxic substances. Instead of a health supporting, tranquil environment, it will become an environment of on-going, inescapable chronic stress; both psychological as well as in the form of more direct physical health challenges. The combination of on-going mental psychological stress and known physical toxic exposure on a population already at high risk for significant adverse impact to health challenges makes it a foregone conclusion that decrease in well-being, ill health, and probable death will occur in this select population if the CRC project proceeds as planned (stages at Thunderbird hotel). Despite awareness of the illness that will result in the HIMHC as a direct result of CRC construction, the CRC plans would also limit this community's timely access to emergency vehicles during the CRC project. **How can the CRC have such blatant disregard for the lives and well-being of this segment of society?**

The significant adverse impact suffered by the residents of the HIMHC is an obvious predictable consequence. It cannot be claimed to be unforeseen. Knowing the unacceptable significant adverse impact the HIMHC residents will predictably suffer; the onus is on the CRC to earnestly explore other alternatives with less impact on this fragile community. One option that would seem to minimize the HIMHC exposure is Jim Howell's common sense alternative option. The common sense alternative by Jim Howell is a 6 minute YouTube video, watch it.

Below are known concerns of HIMHC that have been knowingly overlooked. I have been present at CRC Q&A sessions and it disgusted me to watch CRC people answer questions with an evasive and non-responsive answer. It was offensive and it demeaned members of the HIMHC community's valid concerns. Inability to be "plain and concise" in person just shows that CRC, in person as well as in the DEIS and FEIS failed to be "plain and concise" another violation of NEPA. How many times can CRC violate NEPA and still be approved?

P-073-010

A. SAFEWAY CONCERNS

- It is critical for the health of the low income residents of HIMHC to have fresh food available within walking distance. The only store that meets this requirement is the existing Safeway. 30% of HIMHC residents do not drive, 60% are 65 or older, several require mobility assistance (walker/wheelchair) and therefore cannot walk far. Removing the Safeway will have a highly adverse and disproportionate impact on the well-being of HIMHC.

- The alternative grocery stores listed in the FEIS are all several miles away and are not accessible to a non-mobile community. The FEIS states that people with disabilities or mobility limitations that live near Safeway will suffer a greater impact because they will have to travel farther to get fresh food. The projected transportation improvements do not address or acknowledge the financial and physical limitations of this low income community. These alternatives are 4 miles away, which means that an elderly disabled resident will travel roundtrip over 8 miles, heavy bags in hand to gain access to vital resources like fresh vegetable, meats and fruits.

Below are the FEIS listed alternatives that are unacceptable and do not mitigate:

- Cash in Carry is for restaurants and only sells in bulk
- Fred Meyers in Vancouver – 4 miles away and requires residents to pay a toll.
- New Seasons – 3.6 miles = expensive
- Fred Meyers 3.9 Miles – 4 miles, each way = 8 miles carrying heavy food
- Home delivery= expensive= requires internet, computer, credit card, bank account
- A store equivalent to Safeway, within walking distance of an elderly population must be maintained. Improving vehicle mobility from the island does not help people who depend on walking to get their groceries.

- The FEIS claims that grocery store delivery service is an acceptable mitigation to the loss of Safeway. This alternative presumes the financial resources to be able to afford a computer, the monthly internet fees, a bank account, good credit, a credit card and money to pay for a home delivery fee. This alternative is expensive and completely ignores the financial reality and limitations of HIMHC. This is not an acceptable form of mitigation

- Taking away access to fresh food from a low income community of elderly, disabled residents, and children is a direct assault on the health of HIMHC, a population already at risk. The cost of ill health is the largest drain on U.S. economy. It is clearly not in the best interests of the public to promote ill health, especially to children and elderly citizens. HIMHC will suffer a disproportionate impact compared to other communities specifically because this community is composed primarily of the very young and very old who are the most vulnerable segments of society.

- At the end of section 3.5, under question 2 it states "Does the project affect a resource that is especially important to a low income population" FEIS answered no. The FEIS is wrong. HIMHC residents have continually vocalized concern about losing access to the

P-073-010

only on island location for fresh fruit, meats, and veggies; Safeway. The fragile health of HIMHC will suffer a disproportionate impact if denied fresh food. The very young and very old are less able to respond to challenges to their health. The harm ranges from vitamin deficiencies, diminished capacity to healing from surgery, and diminished capacity to fight infections including even the common cold which will in some instances progress to pneumonia and death.

- At the end of 3.5, Question 4 "would the project result in disproportionately high and adverse impacts on a low income population that would be appreciably more severe or greater in magnitude than the impact that would be suffered by non-minority and non-low income populations?" FEIS answered no. FEIS is wrong. The more affluent, eastern side of Hayden Island can get their groceries delivered. The western side is poor. It is well documented that the poor have less vigorous health. Moreover, HIMHC is composed of children and the elderly, which again are the well documented segments of society most at risk from health challenges. This is a population least able to tolerate inability to have access to fresh food. Therefore there is no doubt that HIMHC will have a highly adverse and suffer a disproportionate impact if their health is further diminished by removing access to fresh foods.

- FEIS lists a Washington Fred Meyer's location as mitigation for the loss of the Safeway. Shopping at this location would force HIMHC residents to travel over 8 miles round trip and pay a toll. Is it unreasonable to expect HIMHC, a low income community to pay a toll every time they need fresh produce and meat.

B. BRIDGE & UTILITIES

- 60% of the residents of HIMHC are 65 or older. In order to avoid a highly adverse and disparate impact against this population the local access bridge must be built in the first phase of the project to ensure efficient emergency access.

  The residents of HIMHC are older, in poorer health in comparison to the general population and thus will have a greater need for rapid access to emergency vehicle medical care. Every second counts for heart and brain injuries. **Any delay in the arrival of medical emergency vehicles will result in permanent injuries and potentially death.** Not only is it morally irresponsible, it is fiscally irresponsible because due to preventable delay in timely access to emergency medical care a greater number of elderly individuals will no longer be able to live independently and will be force to shift to state supported living facilities. This is a hidden cost that must be publicly addressed, in terms of not only dollars, but loss of life, quality of life, and autonomy. Initial construction of the local access bridge to Hayden Island to allow timely rescue and removal by emergencies vehicles is vital to the health and safety of HIMHC. Option A of the LPA, the local access bridge to Hayden Island must be built in the first phase of CRC construction.

P-073-010

- The FEIS included an LPA "option B" which does not provide a local access bridge to Hayden Island. Option B was not included in any alternatives presented in the DEIS and thus excluded the public from discussion and participation regarding the option, contrary to the requirements of NEPA.

- On 10/20/2011 Nancy Body did a question and answer session with HIMHC residents. In this discussion it became alarming clear that LPA Option A is not in any way the committed choice for CRC construction. **It is unacceptable that CRC has not made a commitment on the bridge design when releasing the FEIS**. Giving the public 30 days to comment is abhorrently meaningless when the real decisions are made after the close of the comment period thus eliminating any opportunity for community input on the CRC design. The CRC project is stated to be for the benefit of the public and it is counterintuitive to ignore and remove the public's ability to participate. The public is footing the bill and their input must be directly and satisfactorily addressed.

- The FEIS failed to inform HIMHC that during construction their vital utilities, such as water, sewer, and electricity will be shut off for indeterminate amounts of time. This reality was not in the DEIS or any other document previous to the release of the FEIS. It is unacceptable that CRC did not explore the potential consequences to a population with fragile health, of elderly residents and children. The loss of these vital utilities, even temporarily could potentially have a dire effect. The onus is on the CRC to explore and then mitigate the shutdown of these utilities. Without knowing the current and foreseeable future medical equipment needs in this population CRC cannot determine if any interruption in utilities can be tolerated by HIMHC.

  Did CRC consider that HIMHC residents might use breath apnea machines, run oxygen tanks, kidney machines for home dialysis, using IV medications (morphine pump, or medicinal pump that needs to stay plugged in), or have babies with SIDS – sudden infant death syndrome? Older people use monitors in case they fall; this signal is weak and needs electricity or phone lines to work effectively.

- The CRC acknowledges in the FEIS that it is "especially aware of the sensitive circumstances on Hayden Island" in regards to the shut off of vital utilities. It is knowable that there will be increased illness and death in the HIMHC community as a direct result of the CRC project; Illness and death that would not necessarily occur in a more typical demographic population. CRC has made no commitment nor any statement at all in the FEIS as to what mitigation will be undertaken by CRC to ensure the health and well-being of HIMHC while their vital utilities are shutoff. CRC has not mentioned any financial responsibility in the FEIS as to any mitigation that will be required to protect this community, such as generators or water tanks. The CRC has acknowledges a highly adverse and disparate impact on HIMHC. NEPA requires mitigation steps be taken. Merely acknowledging the hardship the CRC will place on HIMHC is not mitigation. The FEIS is deficient because it fails to state how it will mitigate against the loss of vital utilities.

P-073-010

- **The FEIS does not acknowledge or quantify the illness and death it will cause in an elderly population, in particular HIMHC, as a direct consequence of the project.**

C. AIR QUALITY MONITORING

- A definitive staging site was **not** selected in the FEIS. The FEIS cannot accurately determine the effects to air quality and health consequences to local residents without specifying where the CRC will be bringing and introducing into the air, water, soil, ect. hazardous substances.

- In the FEIS it says that local and regional air quality standards will be met. The FEIS does **not** address how big of a contributor the CRC will be in greenhouse gas emissions (GHG) emissions and other pollutants. Public participation includes informing the community accurately on the expected emissions of GHG's, carbon monoxide, particulate matter, toxic and hazardous substances and other pollutants that will result from the CRC project.

- The FEIS **failed** to state how much pollution the CRC anticipates releasing into the environment. The FEIS failed to address how much release of pollutants are anticipated. There are no graphs or charts with the real numbers as to expected pollution, contamination, and release of toxins into the environment as a result of CRC construction. There is no description of the worst case scenario of maximum exposure. This information is critical for a low income elderly infirm population.

- **The stated pollution plan in the FEIS is extremely inadequate.** The FEIS failed to take into consideration all pollution and only considered pollution and emissions that come from motor vehicles, deliberately choosing to ignore all other present pollution in the project area. For the local residents of HIMHC the air quality health impact will be directly related to the total pollution level that they are forced to endure. It is therefore critical that the current level of pollution, prior to the initiation of the CRC construction project, be accurately and continuously assessed, posted publicly in a timely manner, and satisfactorily addressed. If the current pollution level is already high then there may not be the available margin to accommodate **any** increase in pollution without extremely adverse and disproportionate consequences to the low income elderly and infirm population at HIMHC.

- **The CRC has not done adequate testing of pollution.** It is critical that accurate levels of exposure to current pollution are assessed as soon as possible. Cumulative impacts are unknowable without first ascertaining the current level of pollution. It is outrageous and unconscionable that the CRC, represented by Nancy Boyd, stated on 10/20/2011 at a meeting with HIMHC residents that the **CRC's position is that there is no value in knowing the total pollution levels the HIMHC residents are subjected and no value in having on-site monitoring of pollution. This is a blatant disregard for the health, well-being, and survival capacity of HIMHC, a low income community.** It is clear that the CRC is not only disinterested but not concerned about the health of HIMHC

P-073-010

residents who are currently exposed to significant levels of pollution. To not test the HIMHC community for current levels of pollution is blatant disregard for human life. It is absolutely necessary to provide HIMHC and the public with proper testing. **Proper testing necessarily includes testing all of the project area for current levels of ALL pollution prior to initiation of construction**. Some areas may have high enough levels that construction in that area is not possible because it would sacrifice human health, well-being and life. HIMHC demands that for their well-being, and for proper evaluation of the environmental impacts, a full and thorough pollution test must be done of ALL current pollutants in the Portland Vancouver project area before construction. Additionally, the pollution levels must be continuously monitored by on-site equipment that is placed in the most polluted areas during construction to ensure that CRC is aware of the levels and can notify the public promptly and based on knowledge from this monitoring equipment take prompt and satisfactory action to protect human life. Until the CRC adequately assessing the entire project area by determining the most polluted locations and placing equipment in those locations it has not done the proper testing to meet the environmental impact requirements.

- The CRC and thus the FEIS cannot state the project will not exceed state and federal air quality standards until it does a thorough evaluation of the current air quality. Vehicle emissions combine with already airborne pollution to create compounded effects. The CRC cannot adequately evaluate air quality by only considering vehicle emissions in a vacuum. Properly evaluation of air quality includes an assessment of the entirety of existing and potential pollutants in the air. The impact on HIMHC, a low income elderly population, including many already in poor health, cannot be accurately determined without knowing the total level of pollution; therefore it is critical that the total of pollution is clearly and specifically addressed in a quantifiable manner. It was not.

- The CRC failed to adequately assess air quality because it did not specifically address the levels tolerable to an elderly or youthful population. HIMHC is home to over 100 children and 60% of the residents of HIMHC are at least 65 years old. The young and the old have diminished capability to tolerate threats to their health, especially in a low income population. The members of HIMHC is a low income community and live within 100 feet of Thunderbird hotel. Clearly any decrease in air quality will have a disproportionately adverse impact on children and an elderly population. The demographics of HIMHC were not specifically evaluated in the FEIS and this is very concerning when one of the three potential staging grounds is the Thunderbird Hotel.

- Elderly individuals and children exposed to construction, especially HIMHC which is a low-income community, will be adversely and disproportionately impacted given their diminished health capacity and thus suffer more severe health consequence than a community with a more typical age demographic. The CRC failed to analyze and the FEIS failed to state the expected health consequences of the CRC project on local communities. It is predictable that there will be increased illness and death in this low income population of children and the elderly when they are subjected to many years of decreased air quality, as well as the well documented significant adverse health consequences of chronic stress; stress which will be unavoidable living next to a major

P-073-010

construction site. The Thunderbird hotel is only 100 feet from HIMHC community. Given the low income status of HIMHC, this group meets the environmental justice test of highly adverse and disproportionate impact. The FEIS failed to state and the CRC failed to analyze how many additional deaths are anticipated as a result of the CRC project. FEIS failed to inform Oregonians and Washingtonians of how many people will die as a direct result of the CRC project. Apparently the CRC considers the excess deaths in low income populations are considered acceptable. **We demand acknowledgment of these disproportionate impacts that are highly adverse and give HIMHC the environmental justice status is rightly deserves.**

- Low income elderly people and children have a lesser capacity to tolerate any insult to their health and wellbeing. Pollution which a healthy adult "may" tolerate has the significant potential to have highly adverse, devastating consequences to very young and very old residents of the HIMHC. The CRC either did not take this into consideration when listing the Thunderbird as a potential staging site, or does not value the health and life of low income populations.

- There is no CRC data in the FEIS that proves that there are no long-term air quality impacts as a result of the project other than a reference to a Chicago study. The FEIS used the Chicago study to show air quality standards will not be exceeded during CRC construction. The FEIS failed to state exactly how it took into consideration the differences in environment, weather, topography, air movement, as well as other existing pollutants when comparing these two very different locations, Portland/Vancouver and Chicago. HIMHC and the general public cannot be properly informed nor have a true opportunity to participate without valid data regarding long term air quality impacts.

- The FEIS failed to meet the NEPA requirement of explaining the project in plain and concise language. It is unclear what constitutes the CRC's pollution control plan. The FEIS does not state the percentage of pollution the CRC expects to leak into the environment. The public needs to be informed of the expected leaks and exposure of pollution to the local environment. HIMHC, being a low income community of very young and very old residents who are especially vulnerable to harm to their health must be properly informed of the risks CRC is exposing them to.

- The FEIS failed to adequately explain the specifications for adequate containment of dust. The FEIS failed to state how much lack of containment of dust is acceptable. There is no chart, graph or summary in the FEIS that explains what surrounding communities will be inhaling, dust or other harmful substance in addition to dust. The CRC failed to investigate and failed to inform Oregonians and Washingtonians about the possible pollution, toxins or hazardous substances local residents will inhale as a direct result of dust from construction. HIMHC is directly downwind from the Thunderbird hotel and will suffer a disproportionate impact due its proximity and the effects on this community will be highly adverse given their fragile health.

P-073-010

- There is no study on dust that shows the potential health consequences for low income populations, especially children and the elderly, who will be subjected to and inhale uncontained dust. Uncontrolled dust due to construction is a certainty. The study that should have been done would assess consequences based on the maximum possible dust young and elderly populations could be exposed to as well as an analysis of what that dust might contain; addressing toxins already present that will be made airborne and therefore more toxic to the population, as well as additional pollution created by the construction. There are residents of HIMHC with chronic lung disease and asthma who are particularly sensitive to air quality. To date CRC has done no investigation of the current health, in particular respiratory limitation of the current residents. This is a blatant disregard for the health and well-being of a low income community.

- The FEIS failed to state clearly, or in any detail, what is "prompt removal" of dust under the dust control plan. The FEIS also failed to state what kind of chemicals will be used to control the dust. HIMHC has over 100 children and many elderly residents. This community is vulnerable and lack of care in choice of chemicals used to control dust could have dire effects.

- Some of the buildings to be demolished are older than 1980 and are likely to contain asbestos, lead, or other toxic substances in them. The FEIS failed to explain in adequate detail how vulnerable populations, such as low income children and elderly residents of HIMHC, will be protected from this possible exposure. CRC did not analyze how effective the protective steps will actually be for vulnerable local residents. The FEIS does not state the known or suspected percentage of contaminants that will be released into the local environment initiated by the CRC demolition. The CRC project will cause HIMHC harmful health consequences. Who will pay the medical bills for local residents who get cancer as a result of the release of asbestos from this demolition? Who will pay for the hospitalization for HIMHC residents who have asthma attacks precipitated by CRC construction?

- Under the transportation conformity rules (40 CFR 93.123 (c)(5)), carbon monoxide and particulate matter hot-spot analyses are not required to consider construction-related activities which cause temporary increases in emissions. This means any construction that lasts 5 years or less. A hot-spot analysis was not done at the potential staging sites. This is unacceptable given the immediate proximity of HIMHC, a low income community of the very young and very old, who would be less able to tolerate expose to carbon monoxide and particulate matter. HIMHC challenges this exception and demands that the health and safety of local residents requires a carbon monoxide and particulate matter hot-stop analysis be performed and in particular include focused evaluation of the impact in the HIMHC local area.

- It is well known that construction projects rarely conclude within the projected time limits. Given the strong possibility that the staging area could last longer than 5 years, there should be a carbon monoxide and particulate matter analysis performed at each potential staging area. The lack of this testing is especially mischievous when the FEIS acknowledges that hot-spot testing has already been done as certain locations.

P-073-010

- CRC has not considered the pre-existing hazardous substances already present in the soil, ground water, and environment that will become airborne during construction at the Thunderbird hotel and the project area in general. The HIMHC is low income population directly downwind from this staging area. The children and elderly in this community are particularly susceptible to the adverse impact of toxic substances. This mandates further testing of the staging ground because without knowing what is there how will CRC adequately protect this at risk population.

- Knowing the disproportionate detrimental impact of increased compounded pollution on the low income elderly community HIMHC, the CRC needs to either clean up the Thunderbird Hotel site prior to construction or to use a different site distant from a population with a disproportionate possibility of a high adverse consequence.

D. NOISE/VIBRATION:

- The FEIS states that noise dampening walls will be installed in Vancouver. The FEIS does not state that Portland, in specific Hayden Island, and in particular HIMHC will be protected by a noise wall or any form of sound dampening. It is necessary for specific, adequate noise mitigation on Hayden Island to protect the HIMHC community. The on-going and chronic noise and vibration is going to be a major cause of chronic stress for HIMHC community. The significant adverse effects to health, including death, as a direct consequence of chronic stress are well-known. This impact is highly adverse and disproportionate as compared to the general project area. HIMHC, an elderly population, many in frail health, have a much lesser capability to withstand the health consequences of chronic stress which undoubtedly will result in illness, and will contribute to injuries and deaths. The chronic stress arising as a direct result of CRC construction would be less likely to result in illness, injuries, and death if done at a location with more typical demographics. It is necessary for the health and well-being of HIMHC that an adequate noise wall is built, in addition to other appropriate noise mitigation measures. This is especially true if the Thunderbird Hotel is used as a staging ground given that HIMHC is right next door.

- Knowing the highly adverse consequences to HIMHC if the Thunderbird Hotel is chosen as a staging site, it is unacceptable to even consider the Thunderbird Hotel site as a potential staging area. To use the Thunderbird Hotel as a staging area is blatant disregard for the health and well-being of HIMHC, a low income elderly community. To use the Thunderbird Hotel site as a staging area is tantamount to expressing no regard for the value of lives of low income individuals.

P-073-010

- Vibration and noise, for a prolonged duration is harmful to health. The CRC project would require at least one large site to stage equipment, materials, and a large site for fabricating segments of the new bridges. The Thunderbird Hotel is a potential staging ground and is situated immediately adjacent to HIMHC, a low income community. This proximity exposes HIMHC to the highly adverse and disproportionate impacts of stress as a result of noise and vibration caused by CRC construction. Predictably on-going exposure to this noise and vibration will result in the well documented, numerous, highly adverse health consequences associated with suffering chronic stress.

- The CRC failed to do an analysis on noise and vibration that took into account the decreased health and well-being of the disadvantaged elderly residents of HIMHC community. Proper analysis must specifically investigate and address the effects of noise and vibration, and resulting chronic stress on the HIMHC, given that they will be subjected to prolonged noise pollution.

- The FEIS states that HIMHC will not be subjected to noise and vibration pollution in a disproportion and highly adverse manner. This conclusion is not supported. The CRC failed to specifically detail, with supporting studies, how subjection to prolonged noise pollution would NOT have a highly adverse and disproportionate impact on a low income elderly population.

- The DEQ Noise Source Standards could be exceeded at locations within the adjacent neighborhood due to some staging activities, particular equipment used, and the location of the activities on the staging site. If the Thunderbird hotel is selected for staging activities, additional construction noise monitoring and mitigation measures, beyond those discussed in Section 3.11.5, could be required. There should be additional mitigating measures.

- It is unclear in the FEIS if the CRC has done any studies that evaluate the long-term effects of noise and vibration generated by construction at a staging ground. HIMHC is next to the Thunderbird Hotel, a potential site for noise and vibration pollution. A study evaluating the long-term effects of noise and vibration, in particular the impact on a low income elderly population and in particular the impact on manufactured homes must be done. The CRC's FEIS is incomplete without this evaluation.

P-073-010

- Washington requires that there be a vibration study done evaluating possible impacts on residents from noise and vibration. Even if Oregon law doesn't require it, this should be done so that residents of HIMHC can know the personal costs of having the staging ground right by their doorstep. These costs include harm to physical and psychological health, loss to personal property in and adjacent to the home, vibration damage of the physical structure of homes and out buildings (garage/shed/etc.), and disruption of utilities due to damage to utility pipes resulting from construction related vibration. The CRC cannot claim a lack of knowledge of these financial costs when HIMHC residents have continually informed the CRC of this risk that is already a reality to HIMHC residents due to construction at the Mall. Clearly the proximity of the Thunderbird Hotel staging ground and the construction of the bridge itself, are much closer than the Mall and will result in much greater impacts.

- In the FEIS it acknowledges that HIMHC is concerned about the effects of having a staging area construction site only 100 feet away from their homes, however the only response given is "the project has organized many meetings to hear and address these concerns." These concerns have not been addressed. As an Oregonian, angry at this oversight I demand that specific steps, publicly available, are taken to protect local residents within the CRC project area, in particular HIMHC residents, against harm caused by noise and vibration resulted from CRC construction.

- HIMHC is a manufactured home community; these homes have less insulation and presumably less dampening of noise and vibration pollution. There has not been an assessment of impact of noise and vibration pollution, like pile driving on these types of homes. This must be evaluated to accurately assess the impacts on the health of the residents of HIMHC.

- Along with having less insulation, these homes are not on traditional foundations which will subject the homes to more vibration

- The low income residents of HIMHC will be subjected to a higher level of noise even inside their own homes than would residents of non-manufactured homes. This actual level of noise, which will cause injuries to HIMHC, needs to be determined, taking into account the highly adverse consequences suffered by an elderly community who will be at home all day every day, subjected to unrelenting noise and vibration, in addition to decreased air quality and increased chronic stress. This environment increases the likelihood of injuries, in particular hip fractures given that HIMHC is a low income elderly population. The incidents of deaths within 6 months of hip fractures in an elderly

P-073-010

population are high. Hip fractures and death are highly adverse and disproportion impacts that only the HIMHC will suffer, given their demographics and proximity to the CRC project.

E. HAZERDOUS MATERIALS

- No action is being taken to clean up the Thunderbird hotel despite the acknowledgement in the FEIS that this location was a former landfill and the site for a automotive service station. The FEIS also admits that due to the thunderbird's previous use it is known or suspected that this location has pre-existing contamination of soil and groundwater. The FEIS has not done any testing on this site to determine the extent of the contamination of soil and ground water. The toxins in the ground will become airborne as soon as construction starts and HIMHC will be disproportionately exposed to these toxins mixed with dust. HIMHC is only 100 feet away from this building which means that over 100 children and hundreds of elderly residents will inhale this compounded pollution of unknown toxicity to the determent of their health.

- The CRC's stated preferred alternative, the LPA, exposes the project area to higher levels of risk by choosing an alternative that requires more hazardous materials sites than other alternatives. This means that residents within the project area, specifically HIMHC will bear the brunt of greater exposure to more toxins.

- **The CRC has made no commitment to clean up the project area after the bridge is constructed.** This is very concerning given the fact that the CRC will create at least three hazardous materials sites. In addition to adding to pollution will re-expose local residents, in particular HIMHC, to existing toxins, hazardous substances, and pollution that is currently in the ground, soil and water.

- **The CRC did not test the project area for soil contamination thus the CRC will not know how much pollution at the end of the project is a result of building the bridge**. The CRC needs to test the soil and water before constructing the bridge as well as post construction and needs to make a commitment to clean up and undo the contamination CRC will cause while building the bridge. This is especially important for residents in the project area, namely HIMHC whose ground water and soil will be disproportionately impacted.

- The FEIS did not make any statement as to what precautions will be taken to stop soil contamination from reaching groundwater. Water is an extremely valuable resource and every precaution should be made to protect the Columbia River and ground water in the

P-073-010

project area. The HIMHC, being directly next to a staging area are extremely vulnerable to any contamination to soil and water.

- **The Thunderbird Hotel should not be considered as a staging site** when there are already seven sites on Hayden Island that have moderate risk of containing and releasing hazardous substances. The Thunderbird hotel additionally should not be considered a staging site since it already has a known risk for containing hazardous substances that will be released during construction if this site is chosen. Moreover, to use the Thunderbird Hotel site, will have a highly adverse and disproportionate impact on HIMHC, given that they are downwind, are low income, and have children and elderly residents who will have the least capability to withstand this threat to their health and well-being.

- The FEIS failed to mention what kinds of pollution, contamination, and spills of hazardous substances are possible in the project area during construction. Even a remotely possibility is of concern to HIMHC which is a low income community that has a high risk population of the very young and very old which have a limited ability to tolerate any threat to their health.

- The FEIS failed to mention any analysis that was done on the Thunderbird Hotel for asbestos, lead or other toxic substances. HIMHC is directly next to and downwind from the Thunderbird Hotel. Any substances in this building that become airborne during deconstruction will enter their community, their homes, their bodies, and their food. HIMHC is a population of very young and old that will without a doubt suffer a highly adverse impact from inhaling these hazardous toxins. This harm is disproportionate to the rest of the project area as well as disproportionate to what would be experienced by a more typical demographic.

- The FEIS failed to state the exact locations of the 23 properties that are older than 1980 being demolished and most likely contain asbestos and lead. The CRC project has also failed to inform local residents around these locations who will be exposed to these hazardous substances during demolition. One of the potential locations is the Thunderbird Hotel, which is situated next to HIMHC. HIMHC has a right to know what they will be exposed to during deconstruction of this hotel as well as other sites.

- The FEIS failed to state how big the staging area will be at Thunderbird Hotel. The FEIS did not acknowledge how much area will be disturbed at this location. If the staging area is at Thunderbird Hotel and disturbs less than 1 acre and does not discharge storm-water to surface water then the NPDES (national pollutant discharge elimination system)

P-073-010

requirements will not be met. For the well-being of HIMHC, this is unacceptable and all permits required under NPDES need to be obtained whether or not the Thunderbird staging area disturbs at least 1 acre or discharges storm-water to surface water.

F. ENVIRONMENTAL JUSTICE

- The FEIS in inadequate because it fails to recognize the Hayden Island Manufactured Home Community (HIMHC) as a low income environmental justice community, therefore depriving the residents of the proper Environmental Justice Analysis required by NEPA.

- CRC examined income levels on Hayden Island by using census tract data instead of using the more appropriate block group data. The methodology and unit of analysis used to investigate the possibility of disproportionately impacted low income and minority groups was block group data with the exception of determining low income status in Portland. The use of census tracks instead of block group data when determining low income status in Portland effectively masked the actual presence of an environmental justice community.

- The FEIS wants the public to believe that Hayden Island is not low income; only 9% of the residents qualify under the federal poverty line. East Hayden Island is wealthy. West Hayden Island has a manufacture home community, HIMHC, with over 100 children and mostly elderly residents living on social security, and is undeniable a low income community. The financial reality of each side of this island is drastically different but anyone reading the FEIS would not know this truth. HIMHC's low income status that was covered up by the FEIS has significant consequences for HIMHC because lower income populations tend to have poorer health than more wealthy communities. The effects of CRC construction will have a disproportionate and highly adverse impact on low income children and elderly residents who have less capability to tolerate challenges to their health without dire consequences and lack the financial resources to personally mitigate harm resulting from CRC construction.

- **Through public participation the residents of HIMHC made it clear that their community was EJ and was being overlooked, CRC cannot claim the methodology used was a simple oversight.**

- CRC has failed to use a consistent methodology when identifying low-income and minority communities who would be disproportionately impacted. The use of inconsistent methodologies is suspicious and gives the appearance that CRC intentionally used a different methodology solely for determining low income status in Portlanders with the goal of denying HIMHC their rightful status as an environmental justice community. Using census tracks effectively denied, ignored, and took advantage of HIMHC, a low income elderly population.

P-073-010

- We are all aware that HIMHC community has been targeted due to their low income status. The project staging area was not, and would not be considered in an affluent community like the eastern side of Hayden Island. In the United States of America it is morally reprehensible to try and hide HIMHC's environmental justice status, a goal that is required by presidential executive order 12898. By using a methodology that would hide their low income status CRC has violated NEPA. Knowing increased death will result in a poor elderly community, where death would not occur in a wealthier and healthier community, CRC has essentially takes the position that the lives of the poor have no value. If this is the position of the CRC it should be stated openly. Value of life should not be measured by socio-economic status.

- The cost of living varies from state to state/city to city, it is higher in OR and WA than many other states and using the federal poverty line covers up low income communities in a state with a higher cost of living. The methodology used by the CRC in determining the demographic characteristic of the community is invalid and masks the true nature of the community as significantly low-income relative to the City and County median household income.

- The CRC has failed to accurately determine low income communities given the outdated data used. Since 2000, unemployment has doubled, availability of jobs has decreased, and the economy is significantly depressed. Using outdated statistical information overstates the current financial reality of HIMHC residents. This is unacceptable given that the CRC surveyed some communities for income levels but did not do so for HIMHC, who continually voiced concern of being overlooked as a low income environmental justice community. The limited date CRC chose to collect, using 10,000.00 increments, effectively masked HIMHC's environmental justice status by forcing residents to claim a higher income bracket that does not accurately reflect financial reality. HIMHC has 1,300 residents which include over 100 children; it would not have been over burdensome to survey the actual income of this community. If such a survey would have been done HIMHC would be considered an environmental justice community.

- One of the aforementioned objectives is to specifically target minority, low-income, and limited English-speaking populations within the project area for stakeholder outreach and feedback. Stakeholders that have been identified are;

Low-income residents, minorities, and people speaking limited English (Spanish, Russian, Vietnamese), as identified in the 2005 demographic analysis for the Bridge Influence Area. . In the FEIS the CRC states that all NEPA requirements have been met or exceeded for public involvement, including **Executive Orders 12898 and 12948, which require each federal agency to make achieving environmental justice part of its mission "by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on**

P-073-010

minority populations and low-income populations." If this is the case, then shouldn't block group date been used on Hayden Island because of the income disparity that exists?

G. ADDITIONAL ISSUES

- Jim Howell's Common Sense Alternative was never considered as an alternative in the DEIS or FEIS. This alternative projected to cost half as much as the LPA, 1.8 billion instead of 3.6 billion. This is a significant difference given that the CRC project will actually cost 10 billion once all promissory notes and debts are paid. It is unacceptable that the CRC did not make a good faith effort to consider all alternatives especially since it is the tax payers who will bear the brunt of this debt.

- The CRC failed to consider Jim Howell's CSA which should have been considered because CSA will cost half as much, would not cause a 5-10 year increase in traffic and disruption on I-5 and would not take away the Safeway on Hayden Island, a vital resource for a low income community. Additionally, using this alternative does not focus on an enlargement and shift westward of the I-5 bridge and therefore would not have a highly adverse and disproportionate impact on the low income elderly HIMHC, a community least able to tolerate the effects of CRC construction without severe illness and death.

- The CRC Task Force voted on the LPA before looking at over 15,000 public comments. This is a violation of NEPA which requires public participation. Asking for comments is not enough; the CRC must additionally thoroughly read and respond adequately to these comments to meet public participation requirements.

- It is unacceptable that METRO preapproved the FEIS before it came out to the public. This again is a violation of NEPA because METRO approved the CRC project without even considering public comments and thus did not allow public participation.

- NEPA requires that the DEIS and FEIS be "plain and concise." The average person that has no technical training or special degree will not be able to read the FEIS and understand what this document means. The document as a whole is not plain or concise. The FEIS is not written in plain language that helps a reader understand the FEIS as a whole.

CONCLUSION

As a resident of Portland I find it alarming that such a vulnerable community, HIMHC, is being treated with such disregard. This offends me on an individual level, as a human being, and as a citizen of the United States of America. This poor community is being ignored, a sheep thrown to wolves. It is unethical to put a construction site within a stone's throw of a community

P-073-010

who will be devastatingly harmed by the well documented severe health consequences; including death caused by chronic stress, unnecessary injuries (hip fractures), increased asthma attacks, difficulty breathing, as well as dust, pollution, leaking chemicals, air borne asbestos/lead, particulate matter from diesel fuel, soil contamination, and water contamination, this list is not exhaustive. Thunderbird Hotel will end up a super fund site because CRC feels free to add to existing pollution without any semblance of responsibility to clean up their mess or the known pre-existing pollution at Thunderbird which will be compounded with new pollution caused by CRC construction.

- Do not let CRC overlook existing and valid environmental justice communities, including HIMHC. HIMHC deserves environmental justice status, and this is not the only group overlooked.
- The Thunderbird Hotel should be removed as an option for a construction staging ground.
- CRC should not be able to let a construction company decide where to place a staging ground in order to pass the buck and blame a private party instead of the real culprit the CRC.
- Nancy Body admitted on 10/20/2011 "there is so much still unknown." How dare the CRC release the FEIS with so many contingencies unknown.

Make CRC go back to the drawing board, be accountable to the public and make actual final decisions like; (1) LPA option A or B, (2) where exactly will the construction sites be, (3) what is the actual total pollution level, (4) including all existing pollutants in the air, not arbitrarily limiting it to vehicle emissions in the project area, (5) determine if we are putting too much pollution into one area, (6) is the project, as currently designed, truly addressing the problem and offering a progressive solution, (7) how much will the tax payers actually have to pay 4 billion or 10 billion, (8) admit HIMHC is an EJ community, (9) keep the Safeway, (10) consider building a new bridge and only upgrade I-5 for earthquake safety, (11) enhance public transportation, put that 4 billion towards education instead of a bridge. RESPECT the voice of the public. Leave I-5 alone.

After reading the FEIS I personally feel that CRC should start over. They did a very poor job, CRC over looked important environmental concerns, lied to the community, misrepresented

P-073-010

themselves and their intentions, have not made a valid effort to protect minorities and the poor (low income communities) or endangered species. The CRC is taking away over 60 million in annual revenue from Hayden Island, in a bad economy this is a very poor decision. CRC is forcing 643 people onto unemployment benefits, another expense put on the tax payers bill. Do not let the CRC continue to harm Oregon.

Respectfully,

Concerned Oregonian

Hines, Maurice

From: Kelly Meunier [kmeunier@willamette.edu]
Sent: Sunday, October 23, 2011 3:00 PM
To: Columbia River Crossing
Subject: FEIS comments
Attachments: Victor Veits Comments.pdf

NEW Columbia River Crossing (CRC) Final Environmental Impact Statement (FEIS) Issues for Hayden Island --Victor Viets 10/13/11

P-074-001

1. Arterial Bridge is now optional. The East Side Multi-Use Path (MUP) is now an option in combination with the arterial bridge. These are the only options in the entire project. The arterial bridge is listed as the preferred option but no basis for future final decision is provided.

2. Project will now displace 39 island businesses serving primarily local clientele at a loss of $62.7 million in annual sales and 643 local jobs. "New" business displacements announced in the FEIS include The Chevron station, the car wash, Taco Bell and the Wells Fargo Bank.

3. The HI LRT Station is now shown as a standard TriMet design without a station shelter. The designs that were developed by the PWG with extensive community input are not included. There is no discussion of local handicapped parking and no mention of closure of the existing park and ride at Expo station. There is no discussion of an east-west shuttle bus service to help Island residents get to a LRT (light rail train)
station or to any regional bus stop during construction.

4. Storm-water Treatment Wetlands now occupy the entire site of the new local retail center shown in the Island Plan but this is NOT identified as an impact to the community. We have repeatedly asked CRC to move these treatment facilities to comply with the Island Plan.

P-074-002

5. For some reason, the Arterial bridge option uses the entire Safeway site for storm-water treatment while the no-arterial-bridge does not.

P-074-003

6. Hayden Island now has the longest construction time for the entire project-------
-5-1/2 years. Construction noise (including pile driving) and air quality impacts during construction seem to be ignored.

P-074-004

7. The waterfront park areas identified in the Island Plan are not included and part of the proposed park area is used for additional stormwater treatment ponds. This is not identified as an impact on the community. We have repeatedly asked for this state-owned-land to be made available for park use. On the Vancouver side, the project has created park areas at the bridge landing and donated surplus stateowned-land for park use.

8. The FEIS makes a case that the Island community will benefit significantly from the project and that final design will be consistent with the Island Plan. No long-term impacts on community liveability are identified. This has not been

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P-074-001

The Portland Working Group (PWG) was formed in May 2009 to advise the project on transit related issues for the Oregon side of the project, using the LPA and Hayden Island Plan as the basis for discussion. Beginning in September 2009, the PWG held a series of three interactive design workshops and Open Houses with CRC project, TriMet, the City of Portland staff and the general public to develop a set of design principles. The design principles were developed in such a way as to capture the community's values while remaining broad enough to apply to the future station design regardless of CRC project decisions that may affect the position of I-5, local road circulation, and land development patterns.

The resulting Hayden Island Light Rail Station Conceptual Design Report published January 2010 provides guidance to the CRC project, TriMet, and the City of Portland regarding the Hayden Island station design. PWG members reviewed and approved the report. The Conceptual Design Report solidified the Hayden Island Light Rail Design Principles.

The Hayden Island LRT station cross sections in the FEIS show a conceptual design with place holders for station elements. The illustrations show the Hayden Island LRT station as an elevated station with a center platform. During final design, CRC is committed to working with the community to advance the station design.

At the December 2010 PWG meeting, TriMet representatives discussed bus service. TriMet will work closely with the contractors during CRC construction to ensure that Line 6 continues service to Hayden Island. When developing a bus service plan along a new light rail line, TriMet re-evaluates all bus service within the vicinity of the new line with the intention of maximizing ridership and limiting service duplications. As part of this process, TriMet conducts ridership, cost, and operational analyses.

P-074-004

demonstrated given the facts:

-The island will be cut in half by a very un-neighborly concrete barrier that will extend across the entire island and will be 4-6 stories high and several city blocks wide.

-The project will displace virtually all of the locally oriented retail businesses with a loss of 643 local jobs. The losses will include the only grocery store providing full service meat and fresh produce departments, the only gas station, the car wash, one of the two banks, and virtually all the local restaurants.

-The project will preclude future development of the neighborhood retail center called for in the Island Plan and appears to deny public use of the state-owned-lands for planned shoreline parks.

-The project will permanently displace numerous floating residents and will result in loss of local jobs for many Island residents.

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The project will work with TriMet and the Hayden Island community to develop a bus and circulator service plan during construction and after light rail opens in 2019. On-street parking is shown in the current roadway designs for Tomahawk Island Drive. The project will work with the City of Portland and the Hayden Island community to refine the parking designations near the LRT station. Delta Park will serve as the nearest park and ride to the Hayden Island light rail station, a distance of 1.17 miles from the Hayden Island light rail station. The distance between the park and ride lots at Expo Center and Delta Park is 0.69 miles.

P-074-002

With Option A, the multi-use path generates some additional stormwater, which must be managed nearby. Also, the design for Option A evolved beyond the design assumptions in Option B. Option A has been selected in the Record of Decision.

The stormwater facilities shown in the FEIS will continue to be refined as design work progresses. Under the terms of the Biological Opinion, the CRC project must treat stormwater runoff using bioretention, bioslopes, infiltration ponds, porous pavement, constructed wetlands, and vegetated and soil amended swales designed for infiltration. Stormwater runoff is currently not treated before being released to the North Portland Harbor or Columbia River.

P-074-003

Construction-related noise and air quality impacts are discussed in Chapter 3 of the FEIS. The project recognizes that these impacts could disturb and otherwise affect residents and has identified mitigation measures to reduce those impacts. Mitigation commitments are described in the ROD and will be further developed during final design. There will be on-going coordination with local residents on this issue.

P-074-004

Regarding the Proposed Parks

The transfer of 0.4 acre of surplus land to the City of Vancouver is mitigation for the project's direct impact on the City's existing Waterfront Park, an existing public park and a Section 4(f) resource. The project has no impact to public parks on Hayden Island and therefore no need for such mitigation. The CRC project does not currently propose to convert the existing Thunderbird site on Hayden Island into a public park, but it also does not preclude it from becoming a public park in the future. Decisions regarding the disposal of surplus property after project construction will be made at a later date.

Regarding the I-5 "Barrier"

Though the project will be higher than the existing facility, the LPA design will be less sprawling across the landscape. Currently, land is unable to be used as it is within DOT right-of-way, inside the ramp loops. The LPA will not use this type of design and will not require these large loops.

Regarding Displacements

Refinements and new information resulted in additional displacements. We do not expect that all the businesses assumed to be displaced will necessarily have to be displaced, but it is prudent to be conservative about impacts in the NEPA process. Also, some of the displacements would be affected only by diminished access, not by demolition. It is possible that some of these properties and buildings could be re-occupied by other businesses that would not be so affected by the revisions in access.

Regarding Stormwater Ponds

The stormwater facilities shown in the FEIS will continue to be refined as design work progresses. Under the terms of the Biological Opinion (BO), the CRC project must treat stormwater runoff using bioretention, bioslopes, infiltration ponds, porous pavement, constructed wetlands, and vegetated and soil amended swales designed for infiltration. Stormwater runoff is currently not treated before being released to North Portland Harbor or the Columbia River. The Hayden Island Redevelopment Plan states that runoff from local streets will be treated in roadside planters and that CRC stormwater will be managed in a "green, state-of-the-art manner." It is unfortunate that the HI Plan map did not show the constructed wetlands, a "green" concept for stormwater treatment that has been shown in our documents as early as May 2009. The stormwater treatment proposed in the FEIS does include the "green streets" approach proposed in the Hayden Island Redevelopment Plan to the extent feasible. This approach to stormwater treatment is not suitable for streets located under bridges (where it will be difficult to establish plants) or where streets are at or below the seasonal high groundwater table. In addition, care was taken to ensure that the facilities are located on land that is either currently owned by ODOT or would need to be acquired for CRC construction, independent of stormwater management. The current proposed water quality facilities fulfill that requirement. While wetlands are typically permanent bodies of water, they are not stagnant. Water flows through them during frequent rainfall events, producing conditions that are not conducive to mosquito larval development. As stated above, a constructed wetland is one of the BMPs listed by NMFS in its BO as providing the level of treatment necessary to protect endangered species found in the Columbia River. As such, the discharges are considered by the agency to meet its stringent requirements. We will be further evaluating the potential for infiltration. We will continue to review the developing design to determine

whether additional streets lend themselves to this method of runoff treatment. The project will need to deal with runoff from almost 28 acres of impervious area comprising I-5 pavement across Hayden Island, associated ramps, elevated transit guideway, and structures.

Hines, Maurice

From: Sharonnasset [sharonnasset@aol.com]
Sent: Monday, October 24, 2011 2:51 PM
To: Columbia River Crossing
Subject: This is to be added to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

P-075-001

This is to be added to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

I sent in over 420 pages and data of false and inaccurate statements by the Columbia River Crossing staff during the DEIS. I have NEVER received any answer to the packages I sent in ….. I EXPECT !!!!!!!!!!! to receive an answer on each and every question with honest verifiable data. I expect every piece of data to be placed in the final Environmental Impact Statement.

Sharon Nasset
CEO Third Bridge Now
503.283.9585
Sharonnasset@aol.com

P-075-001

Please see the responses to Ms. Nasset's comments made on the DEIS: P-0781, P-0797, P-0936, P-0977, P-1058, and P-1168. These comments and responses were published with the Final EIS on September 23, 2011.

Hines, Maurice

From: Sharonnasset [sharonnasset@aol.com]
Sent: Monday, October 24, 2011 8:33 PM
To: Columbia River Crossing
Subject: rmal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project. -2
Attachments: ccc_nepa_not_followed.TIF; CRC_Sponsor_Responsibilty.doc; 2-FTA questions removal of projects.doc

Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

COLUMBIA RIVER CROSSING ALTERNATIVES, FORECASTING METHODOLOGY, AND RESPONSE TO QUESTIONS
(from Federal Transit Administration)
Dec. 8, 2006 page2

P-076-001

The CRC project team has presented its recommendations for which alternatives should proceed into the DEIS to the CRC Task Force, a 39-member panel of community representatives, business representatives and elected officials who oversee the project, at their November 29th meeting. This narrowed set of alternatives will be carried forward through a public input period prior to beginning the DEIS process. Following two months of intense public outreach efforts aimed at sharing these alternatives with the public and gathering their input, the CRC Task Force will review the public comments and make their final recommendations on the DEIS range of alternatives at the February 27, 2007 meeting. This refined set of alternatives will be fully documented in the Detailed Definition of Alternatives report which will include plan and profile drawing sets that establish the footprint of the project for the DEIS, targeted for the Spring of 2007.

CRC Staff makes false statements to the FTA

1. The CRC Task Force was an advisory committee to the Project Sponsor's Council an advisory committee to the Signatory CRC Sponsor Agencies. The CRC Task Force was NEVER an oversight committee.

2. The alternatives were removed without following the NEPA process of a thorough study

3. The alternatives were removed before define or being refined

4. The alternatives were removed before and only the "narrowed " alternatives carried though for citizen input. Citizen and work groups did not see all the alternatives. The CRC Task Force did not see refined alternatives before removing them.

5. Only the narrowed alternatives were refined or fully documented

6. The Board of Clark County Commissioners letter attached states concerns about the November 29th meeting that removed alternatives. " The Board of Clark County Commissioners believes that that the NEPA process is substantially flawed and recent action taken by Columbia River Task Force is arguably illegitimate.

All alternatives highway, transit, and rail were removed by the CRC Task Force advisory committee.

Sharon Nasset
CEO Third Bridge Now
503.283.9585
Sharonnasset@aol.com

P-076-001

The CRC Task Force was advisory. The text stating that they oversaw the project was an error. Regarding the letter from the Clark County Board of Commissioners, the decision the Task Force made at its meeting on November 29, 2006, was not their final recommendation of alternatives. It was a decision to forward a set of alternatives to the public for additional input and comment, prior to the Task Force voting on a recommendation of alternatives in February 2007. Following this letter, the Clark County Commissioners were subsequently afforded additional opportunities to ask questions about and provide input on the range of alternatives. At its meeting on February 27, 2007, with Clark County Commissioner Steve Stuart participating, the Task Force made its recommendation on alternatives to advance to the DEIS. The motion passed with 33 members in favor, none opposed and no abstentions.

Please see responses to Ms. Nasset's other comment letters submitted on the FEIS, including letter P-077 regarding the RTC letter and the Board of Clark County Commissioners' letter, and letter P-079.

2439

BOARD OF CLARK COUNTY COMMISSIONERS
Betty Sue Morris • Marc Boldt • Steve Stuart

proud past, promising future

CLARK COUNTY
WASHINGTON

1300 Franklin Street • P.O. Box 5000 • Vancouver, WA 98666-5000 • tel: [360] 397-2232 • fax: [360] 397-6058 • www.clark.wa.gov

December 18, 2006

Mr. Douglas B. MacDonald
Secretary of Transportation
Washington State Department of Transportation
Post Office Box 47300
Olympia, WA 98504-7300

P-076-001

Dear Secretary MacDonald:

We write to share our concerns regarding the National Environmental Policy Act as it relates to the Columbia River Crossing project. The Board of Clark County Commissioners believes that the NEPA process is substantially flawed and any recent action taken by the Columbia River Task Force is arguably illegitimate.

On the evening of Wednesday, November 29th, the Columbia River Task Force met in regular session. During the proceedings, the Chairman, Hal Dengerick, deviated from the agenda by accepting a motion from Rex Burkholder Burkholder "to accept the project team's recommendations… and forward the report to the public for comment." The motion was seconded, voted on, and passed.

The Board of Clark County Commissioners takes objection to this deviation. The agreed upon and predetermined process would have allowed each member of the Task Force to go back to their respective bodies and present the staff alternatives. The motion as passed denied Clark County this opportunity.

Unfortunately for the residents of Clark County and the customers of C-Tran, Commissioner Stuart and Commissioner Morris had to depart the meeting early to attend the Clark County Planning Commission hearing on the Comprehension Growth Management Plan. Since there was no prior notification, each Commissioner was unaware of the vote and therefore, had not appointed an alternate to vote on their behalf.

The Board believes that a decision of this magnitude should have followed the agreed upon process. We should have had plenty of advance notice and a printed copy of the text. We believe this vote undermined the integrity of the NEPA process, for there needs to be a higher degree of consensus, and not a vote that was passed marginally or for the ease of a few.

On a night in which Governor Gregoire addressed the Task Force as a whole and urged our region to not be competitors but partners in the CRC project, we find it inappropriate what transpired. Over 400,000 residents live in Clark County, and as the duly elected Board, we find it unacceptable to be left out of this process. Therefore, we seek a fair and objective analysis as well as a reasonable opportunity to comment on the project. There needs to be a frank and honest discussion about the staff recommended alternatives, and Clark County needs to be involved.

Sincerely,

Marc Boldt
Chair

Betty Sue Morris
Commissioner

Steve Stuart
Commissioner

2439

WHO IS INVOLVED?

P-076-001

A project of this size and complexity must, of necessity, bring together many stakeholder groups with a wide range of interests. Each of these groups has a unique role to play in the decision-making process. Some provide the technical data needed to compare alternatives while others help compare and choose the alternatives.

Project Development Team

Responsible for day-to-day project management. Working groups will assist the team with specific issues such as freight, public involvement, and financing issues.

Regional Partners

Advises Project Development Team and assists with project development. Includes major public agencies with transportation jurisdiction within the project area:

- Oregon Departments of Transportation (ODOT)
- Washington Department of Transportation (WSDOT)
- Metro
- Southwest Washington Regional Transportation Council (RTC)
- TriMet
- C-TRAN
- City of Portland
- City of Vancouver
- Federal Highway Administration (non-voting)
- Federal Transit Agency (non-voting)

Task Force

39-member group of representatives from a broad cross section of the Oregon and Washington communities, including public agencies, businesses, civic organizations, neighborhoods, and freight, commuter, and environmental groups. Provides recommendations to the Project Sponsors Council.

Project Sponsors Council

Makes decisions at each decision point based on recommendations from the Task Force, public input, and advice from Project Development Team:

- WSDOT
- ODOT
- RTC
- Metro
- C-TRAN
- TriMet
- City of Vancouver
- City of Portland
- Clark County
- Multnomah County
- Port of Vancouver
- Port of Portland

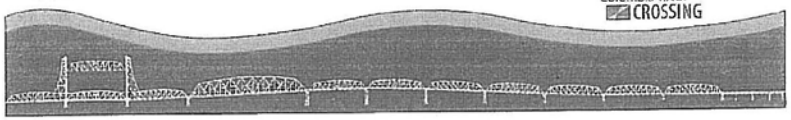
Bi-State Permitting and Regulatory Group

Coordinates and streamlines regulatory reviews and permitting. The group includes federal, state, and local agencies responsible for protecting air, water, wildlife, and cultural resources.

Federal Highway Administration and Federal Transit Administration

Co-lead agencies for the National Environmental Policy Act (NEPA) process that governs proposed actions requiring federal funding, federal permits, or federal approvals. Will sign the Environmental Impact Statement and Record of Decision.

Columbia River CROSSING



Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

COLUMBIA RIVER CROSSING ALTERNATIVES, FORECASTING METHODOLOGY, AND RESPONSE TO QUESTIONS
(from Federal Transit Administration)
Dec. 8, 2006 page2

P-076-001

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CRC Staff makes false statements to the FTA

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3. The alternatives were removed before define or being refined
4. The alternatives were removed before and only the "narrowed " alternatives carried though for citizen input. Citizen and work groups did not see all the alternatives. The CRC Task Force did not see refined alternatives before removing them.
5. Only the narrowed alternatives were refined or fully documented
6. The Board of Clark County Commissioners letter attached states concerns about the November 29th meeting that removed alternatives. " The **Board of Clark County Commissioners believes** that that the **NEPA process is substantially flawed** and **recent action taken** by Columbia River Task Force **is arguably illegitimate.**

All alternatives highway, transit, and rail were removed by the CRC Task Force advisory committee.

Sharon Nasset

CEO Third Bridge Now
503.283.9585
Sharonnasset@aol.com

Hines, Maurice

From: Sharonnasset [sharonnasset@aol.com]
Sent: Monday, October 24, 2011 9:52 PM
To: Columbia River Crossing
Subject: Public Comments Environmental Impact Statement concerning the Columbia River Crossing project. -3
Attachments: CCC-letters201010CitizenDocs-2.pdf; RTC_letter_Third_Bridge_Now_not_studied.pdf; newpaper_St._Johns'.pdf; RC-14vsThirdBridger4c.pdf

P-077-001

Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

In the NEPA Scoping process the Bi-State Industrial Corridor a new freeway inside the I-5 Corridor was an alternative. The staff down-grade the alternative, change it's size, length, location and made FALSE STATEMENTS! CRC continues to make false statements to committees, elected officials, and US Legislators. Reasonable alternatives were removed without following the NEPA and CRC procedures. This and other reasonable alternatives have less impact and more benefits than the current "Locally Preferred Alternative"

1. Letter from the Broad of Clark County Commissioners that our project was removed from the CRC project without being vetted. The Clark County Commissioners sit on the RTC and CTRAN boards both CRC Signatory Sponsor Agencies.

2. Letter from the SW WA Regional Transportation Council that our project was removed from the CRC project without being vetted. RTC is a CRC Signatory Sponsor Agency.

3. St. Johns' Review newspaper article Aug 2005 clearly states our project as a freeway.

4. This is a comparison page showing the different between our project and the project CRC staff tried to pass off as our project. The CRC staff continues telling the lies that they studied our project

5. Over 800 signature of citizen wanting our project put back into the process and be thoroughly studied immediately, were handed into CRC staff and they provided not process and refused to put our project back into the NEPA process

Explain exactly why OUR PROJECT Was not thoroughly studied and why was it not put immediately studied. The NEPA process of a range of alternatives thoroughly studied and that All reasonable alternatives must be

1

P-077-001

Many options and alternatives were considered as part of the evaluation process for the CRC project. Only those proposals that could adequately meet the purpose and need were advanced into the DEIS. A number of bypass options and new river crossing locations were studied, and although they would provide some transportation benefits, they could not meet some of the basic elements of the purpose and need for the CRC project. Heavy rail and commuter rail options were also studied in the early alternatives analysis process. These modes and alignments were found to fail to meet the location and service needs of the transit market and so were not advanced, as discussed in the FEIS.

The evaluation and screening of alternatives prior to the DEIS reviewed a range of potential I-5 bypass options with new river crossing locations. This analysis found that building any of the bypass options with new river crossings, in place of making I-5 improvements, would fall far short of meeting basic elements of the proposed action's purpose and need, as discussed in Chapter 2 of the FEIS. The range of bypass/new crossing options studied at that time was wide enough to draw fundamental conclusions about this type of alternative, regardless of refinements that might be made to bypass connection points with I-5, the bypass alignment, or its crossing location. It is not necessary to study every possible bypass connection point, alignment, lane configuration, or new river crossing location, or combinations thereof, to understand the fundamental performance deficiencies of this type of alternative, relative to the CRC purpose and need; without improvement to the I-5 corridor and crossing, bypasses and new crossing locations can not meet basic elements of the proposed action's purpose and need. Many of them can provide benefits, but they can not adequately address basic needs identified by the region for this project.

Alternatives that do not adequately meet the purpose and need are not advanced into the EIS.

P-077-001

studied did not take place.

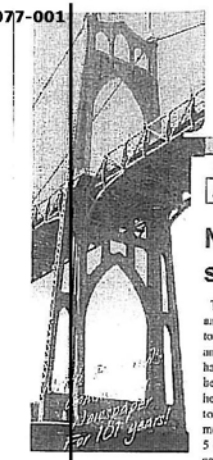
Because of CRC staff continued dishonest and false statements about our project was renamed from Bi-State Industrial Corridor to Third Bridge Now!

Sharon Nasset
CEO Third Bridge Now
503.283.9585
Sharonnasset@aol.com

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

Please see responses to Ms. Nasset's comments on the DEIS (P-0781, P-0797, P-0936, P-0977, P-1058, and P-1168), which were published with the FEIS and included on the CD with the FEIS summary document. Please also see Section 2.7 of the FEIS and the responses to Ms. Nasset's other comments on the FEIS including letters P-075 to P-083.

P-077-001



REVIEW

Arbor Lodge - Bridgeton - Cathedral Park - East Columbia - Hayden Island - Kenton - Linnton - Overlook - Piedmont - Portsmouth - St. Johns - Sauvie Island - University Park

August 26, 2005 North Portland's Community Newspaper - Founded in 1904 Vol. 101 * No. 17

North Portland group expresses own ideas and solutions for improving I-5 traffic

By Gayla Patten
The REVIEW

Truck traffic through St. Johns, and the traffic along I-5 continue to be a main topic of discussion and concern. Millions of dollars has been spent, and continues to be spent, by working groups in hopes of finding the best solution to improve congestion and mobility. Everyone agrees the I-5 corridor will face significant congestion by the year 2020, which will without doubt adversely affect the livability and economic potential of the Portland/Vancouver area.

Two active groups have come up with plans they feel would most benefit the North Portland area . . . there are however, no similarities between the two groups' participants or their ideas, but their goals are the same: to improve the I-5 commute made by citizens and trucks, which will improve the region's economy and livability and also make the area a safer place to drive.

The first is a government task force and has an impressive slate of members from Oregon and Washington. It's called the Columbia River Crossing Task Force (CRC). They have been meeting since 1998 and are formed from three previous task forces.

The 2nd is a private, nonprofit group called The Economic Transportation Alliance (ETA). It is an informed and concerned group of community citizens.

Both groups have spent endless hours studying their proposals. Their studies are complex, but in the simplest terms possible, include the following results for improvement:

The CRC's recommendation is a new bridge in place of the current Interstate Bridges, widening sections of I-5's lanes and improving on/off ramps.

The ETA's plan includes two long bridges, a shorter bridge and a new freeway from the Port of Vancouver, across west Hayden Island to the Rivergate Industrial area, then across the Willamette River to U.S. 30 north of the St. Johns Bridge.

ETA members say their plan would not be cheaper than the CRC Task Force's, but it would better improve many bottlenecks between the Marquam Bridge and Columbia Boulevard by creating new routes that more efficiently move commuters and cargo. The group's proposal is creative with interesting designs and has the support of several area politicians and business leaders.

Sharon Nasset is a well known North Portland resident and real estate agent, and a member of the ETA. She said many previous decisions made by groups were based on the fact they thought the Interstate Bridge was in bad shape and needed major renovations or replacement. However, later reports said that its structure was sound and would be good for another 50 years. The ETA's plan would preserve the I-5 Bridge but downriver from it, at the Port of Vancouver area, would be a triple deck bridge with six lanes for cars on the top deck, trucks using the center span, and rail, Amtrak and perhaps a light rail line, using the bottom deck.

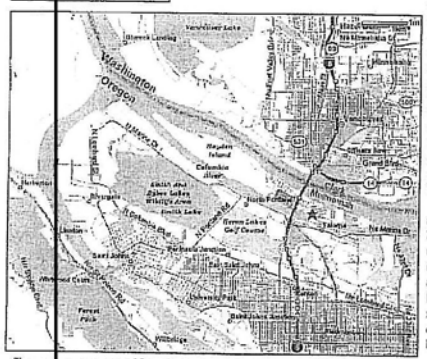
The bridge would continue across West Hayden Island and connect to the mainland via a shorter bridge. The new route would then pass through the Rivergate Industrial area, and cross the Willamette River near Linnton. This bridge would be for cars and trucks only. The route would then use a new freeway paralleling the Old Portland Highway and Columbia Boulevard.

Oregon Department of Transportation is currently in the process of completing an Environmental Assessment document for the I-5 Delta Park to Lombard section which is expected to be released October 2005. There will be a 45-day public comment period and a public hearing at the end of October after which ODOT will select a final alternative. Federal Highway Administration approval is expected in the spring of 2006 and construction is anticipated to begin in 2008.

Time will tell if Nasset and her group will be heard by the Task Force. But North Portland's many dedicated, well informed citizens, who have won many important battles the last ten years, may dictate that it should at least be listened to and considered.



Sharon Nasset, North Portland resident, is part of a group called The Economic Transportation Alliance. They have an imaginative solution for improving I-5 traffic and truck traffic through St. Johns.



Two groups are searching the best way to improve traffic along I-5. The Columbia River Task Force would like to replace the I-5 bridge, create more lanes and improve some on-ramps, among other things; The Economic Transportation Alliance would like to put a three-deck bridge from the Port of Vancouver, across Hayden Island, and pass through the Rivergate industrial area to Linnton.

THIS ISSUE

Letters to Editor
From the Editor
Community News
Crossword Puzzle & Sports
Business & Service Directory; Rest Facilities needed
Residential Rentals
Citywide Classifieds

[redacted]

In June planning for the future of 1.2 acre Patton Park on Interstate, just south of Killingsworth, began with a community survey, followed by a design workshop.

A survey was sent to addresses surrounding the park and asked opinions about the park's future. PP&R reported that it was obvious to them that the park gets a great deal of use from neighbors and there was a strong interest in keeping it and adding some upgrades and enhancements.

The St. Johns Review, Inc. 315-840, 2209 N. Schofield, Portland, Or. 97217

[redacted]

P-077-001

Group offers detour from plan for new I-5 bridge

A private alliance says Washington and Oregon should consider other routes to avoid bottlenecks

Thursday, August 18, 2005
BILL STEWART
The Oregonian

As teams from Washington and Oregon start to plan for a new $1 billion Interstate 5 bridge, a private, nonprofit group is turning up the volume on its warning that the bridge is going in the wrong place.

The Economic Transportation Alliance, which is composed of concerned residents and which has no ties to government groups, says its plan wouldn't be cheaper, but it would eliminate bottlenecks on Interstate 5 by creating new routes that more efficiently move commuters and cargo. Its blueprint includes two long bridges, a shorter bridge and a new freeway from Vancouver's port area across west Hayden Island to Rivergate Industrial Area, then across the Willamette River to U.S. 30 north of the St. Johns Bridge.

Conversely, an I-5 proposal being prepared by officials from Oregon and Washington is in the wrong place, according to the alliance, because it does nothing to eliminate the bottleneck in Portland from Columbia Boulevard to the Marquam Bridge. That plan calls for 10 bridge lanes narrowing to six lanes at either end.

The bi-state team is following the directives of three consecutive task forces -- dating to 1998 -- on congestion and freight delays. The alliance, whose plan has drawn the support of several area politicians and business leaders, is using excerpts from the same reports to argue that a wider bridge in the same place solves nothing.

"Many of the earlier decisions were based on the expectation that the Interstate bridges were crumbling, in bad shape," said Sharon Nassett, a Portland resident who has been publicizing the alliance's highway route for several years. "And then the report came out saying the old bridges would last another 50 years, that they are structurally sound, but we are stuck with the incorrect assumptions" that the bridges are failing.

Austin Pratt, regional bridge permit supervisor for the U.S. Coast Guard in Seattle, said unresolved issues include limiting the height so the bridge is not a threat to planes using Pearson Field or Portland International Airport, deciding how much clearance is needed by boats, and lining up a boat channel so

He noted that one reason for all the studies was to eliminate the sole freeway lift span between Canada and Mexico. However, the bi-state team recently presented to regional transportation officials sketches of plans that included as many as four lift spans.

"I don't think the Federal Highway Administration will approve that," Pratt said. He said the lift spans can stay if the two old bridges remain.

The alliance proposal calls for preserving the I-5 bridge but adding a single-span, triple-deck bridge just west of Vancouver's Amtrak depot, where the Fort Vancouver Plywood mill once stood. Early drawings show a single arch with no in-stream piers for boaters to dodge, and no lift or turntable opening area.

The triple-level bridge would include six lanes for cars on the top deck and six lanes for trucks on the middle level. The bottom deck would include six rail tracks -- four for freight trains and Amtrak, and two available for light rail. The plan also would need a shorter bridge south from Hayden Island across the Oregon Slough, and a high, long bridge over the Willamette River.

One supporter of the alliance plan is Tom Mielke, Republican candidate for Clark County commissioner. Mielke, a former Washington legislator, said those blindly rushing ahead on an I-5 corridor plan are not using common sense.

"It seems like everyone is too anxious to spend the money," Mielke said. "Some of the problems with building another Interstate Bridge are obvious."

mis infor-mation

Nassett, who is in real estate sales in Portland's St. Johns neighborhood, lost some supporters when she backed away from creating a Westside Bypass through Washington County. And more recently, she's erased a double-decked freeway above the railroad in what BNSF Railway calls the Willamette Cut through St. Johns, saying the old plan did little to get rid of large trucks in St. Johns' residential neighborhoods.

The new version calls for trucks and cars -- but no trains -- crossing the Willamette River near Linnton. That

↑ Yes trains

P-077-001

vehicle traffic would use a new freeway paralleling the Old Portland Highway and Columbia Boulevard.

Another advocate for the industrial route is Portland businessman Paul Edgar, who says the official bi-state study team should be sidetracked before it runs through more than $50 million in federal and state grants for environmental study -- of the wrong route.

While the official team is following directives set out in previous reports -- three through lanes in each direction, two local access lanes in each direction, and some provision for mass transit -- the alliance is using those directives to say wrong place, waste of money.

For example, Don Wagner, regional administrator for the Washington State Department of Transportation, told his state commission, "There physically is no room for additional lanes in the (I-5) corridor."

Wagner, who previously held a similar job for the Oregon Department of Transportation, said I-5 cannot be widened between Lombard Street and the Fremont Bridge.

Minutes of a Washington transportation meeting in 2004 cite Wagner as saying, "Enlarging the Columbia River Bridge will not add capacity to the I-5 corridor."

One controversial aspect of the alliance's plan is the northern link to I-5. It proposes putting trucks and cars in a deep trench along Mill Plain Boulevard and 15th Street. To build the trench, a 5-year-old stretch of concrete -- which cost $36.5 million in 2000 and 2001 -- would be ripped out and overpasses built for surface traffic.

Wagner has speculated it could take 20 years to get the necessary permits and build a new I-5 span, but Nassett has been urging officials to use the work of previous studies. She thinks the alliance's version could be resolved in five years.

Bill Stewart: 360-896-5722 or 503-294-5900; billstewart@news.oregonian.com
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Difference between Third Bridge Now and other alternatives

P-077-001



RC-14 map

CRC River Crossing 14 (RC-14) bi-state industrial corridor

Third Bridge Now

also known as
BI-State Industrial Corridor



B



West Option 4

An arterial "parkway" version of the Bi-State Industrial Corridor

Third Bridge Now

also known as
BI-State Industrial Corridor





An arterial "parkway" version of the Bi-State Industrial Corridor

Information generated by the I-5/ Columbia River Crossing Draft Environmental Impact Statement was consulted for setting the evaluating the Option West 4 Corridor

Third Bridge Now

also known as
BI-State Industrial Corridor



www. Thirdbridgenow.com / Thirdbridgenow@aol.com /503.283.9585

Difference between Third Bridge Now and other alternatives

P-077-001

Third Bridge Now, the original BI-State Industrial Corridor

A mini freeway attaching to I-5 freeway and Mill Plain in Vancouver 6-general purpose lanes, 2-center managed lanes (for emergency vehicles and buses) bike, and ped the entire route. New heavy speed rail bridge with commerce and commuter use. The freeway's alignment attaching to I-5 at Mill Plain, west to Port of Vancouver, south following /BNSF rail line and North Portland Rd., west paralleling Columbia Blvd., to Oil Time Rd. and across to HWY-30 near 124th and Newberry Hill. A tunnel to Swan Island for vehicle, bike, ped, and heavy rail. Vehicle capacity 120,000+, Approximately 7 miles of freeway with 10 on/ off ramps at major intersections.

Third Bridge Now



CRC River Crossing 14 (RC-14) bi-state industrial corridor

A 4-lanes arterial, with lifts, and stop lights. Starting at the Port of Vancouver and ending at Marine Dr. No commuter light rail or heavy rail. Approximately 1mile of arterial, vehicle capacity 30,000, was at capacity upon opening, diverted traffic from I-205, and I-8. It was removed from the NEPA EIS by citizen "advisory" CRC Task Force without a thorough study. There are several errors in the CRC study RC-14, concerning alignment and location.

CRC staff used our name yet changed the project significantly.



SW Washington Regional Transportation Council Visioning Corridor Plan in 2008 studied.

An arterial "parkway" version of the Bi-State Industrial Corridor ** It was recommended for further study.

A 4-lane arterial with lifts, and stop signs, that starts at the Port of Vancouver, follows the BNSF rail line south and to HWY-30 near 124th and Newberry Hill. Does not included our tunnel to Swan Island, no heavy rail commerce or commuter. Staff modeled a 4-lane and a 6-lane arterial. The arterioles carried up to 38,000 to 46,000 vehicles and were at capacity upon opening. Removing traffic off of I-5, I-205, I-84, HWY-26, streets adjacent to I-5 and major industrial areas. The alignment helped St. Johns' area. Extra traffic causes capacity issues in downtown Vancouver. **Information generated by the I-5/ Columbia River Crossing Draft Environmental Impact Statement was consulted for setting the evaluating the Option West 4 Corridor



www. Thirdbridgenow.com / Thirdbridgenow@aol.com /503.283.9585

RTC
1300 Franklin Street, Floor 4
P.O. Box 1366
Vancouver, WA 98666-1366

360-397-6067
360-397-6132 fax
http://www.rtc.wa.gov/

November 15, 2010

Ms. Sharon Nasset
1113 N. Baldwin Street
Portland, OR 97217

Dear Ms. Nasset:

P-077-001

This letter is in follow up to your request about a "third bridge option" being studied and included in CRC's Draft Environmental Impact Study (DEIS). Your specific area of interest is about a project described as a new 6-lane freeway connecting I-5 at Mill Plain, west to the Port of Vancouver, south to Hayden Island, Marine Drive, and connecting with highway 30 near Newberry Hill.

The CRC project references in a March 22, 2006 document, RC-14. RC-14 was a possible transportation alternative in the DEIS. RC-14 modeled a multilane, multimodal bi-state industrial corridor starting near I-5 and Mill Plain crossing next to the current BNSF rail bridge and connecting south to Marine Drive. Traffic analysis of the RC-14 alternative showed that it did not sufficiently relieve traffic congestion to any significant degree on the I-5 Columbian River Bridge and therefore not advanced into the next round of alternatives. In sum, this alternative provided for a new industrial corridor, but did not provide for a major freeway that would adequately address I-5 traffic congestion.

A new freeway corridor alternative corridor was also studied. It was identified as RC-16, a New Western Highway. This alternative functioned as a new freeway bypass to I-5 but did not provide direct freeway access to I-5 via Mill Plain.

It is also worth noting that in 2008 RTC completed a Transportation Corridor Visioning Study (http://www.rtc.wa.gov/reports/vision/VisioningCorridors.pdf) that studied new freeway corridors throughout Clark County per a new 50-year growth scenario and given those corridors how a corridor to the east and west might be connected across the Columbia River.

Given your specific concern as stated above, no a "third bridge option" as a new freeway starting at I-5 and Mill Plain was not fully vetted.

Sincerely,

RTC Chair, Washougal Councilperson Molly Coston

cc: RTC Board of Directors

Member Jurisdictions
Clark County
Skamania County
Klickitat County
City of Vancouver
City of Camas
City of Washougal
City of Battle Ground
City of Ridgefield
City of La Center
Town of Yacolt
City of Stevenson
City of North Bonneville
City of White Salmon
City of Bingen
City of Goldendale
C-TRAN
Washington DOT
Port of Vancouver
Port of Camas-Washougal
Port of Ridgefield
Port of Skamania County
Port of Klickitat
Metro
Oregon DOT
15th Legislative District
17th Legislative District
18th Legislative District
49th Legislative District

Southwest Washington Regional Transportation Council

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WASHINGTON

Regional Transportation Council
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AUG 4 2010

July 23, 2010

The Southwest Washington Regional Transportation Council (RTC)
c/o Ms. Molly Coston, Chair
1300 Franklin Street, 4th Floor
Clark County Public Service Center
Vancouver, Washington 98666-1366

RE: Columbia River Crossing (CRC) Environmental Impact Study / Third Bridge Analysis

Dear Chair Coston and Council Members:

P-077-001

This correspondence is in follow up to a repeated request to RTC by concerned citizens about the lack of a "third bridge option" being studied and included in CRC's Draft Environmental Impact Study (DEIS). The specific area these citizens are interested in includes a new 6-lane freeway connecting I-5 at Mill Plain, west to the Port of Vancouver, south to Hayden Island, Marine Dr., and connecting with HWY-30 near Newberry Hill.

The CRC project references in a March 22, 2006, document, RC-14. RC-14 was used to create a possible transportation alternative in the Draft Environmental Impact Study. RC-14 modeled a multilane, multimodal bi-state industrial arterial or corridor starting near I-5 and Mill Plain, crossing next to the BNSF rail bridge and connecting south to Marine Drive. Traffic analysis of the RC-14 alternative showed that it did not sufficiently relieve traffic congestion to any significant degree on the I-5/Columbia River Bridge and therefore was not advanced into the next round of alternatives. In sum, this alternative provided for a new industrial corridor, but did not provide for a major freeway that would adequately address freeway congestion.

A new freeway corridor alternative was also studied. It was identified as RC-16 (New Western Highway). This alternative functioned as a new freeway bypass to I-5, but did not directly connect to I-5 via Mill Plain. The proposed corridor started near Ridgefield and went around the ports.

Given the specific concern, as stated above, the answer is no. A "third bridge option" as a new freeway starting at I-5 and Mill Plain was not fully vetted.

Sincerely,

Steve Stuart, Chair | Tom Mielke | Marc Boldt

cc: Ms. Sharon Nasset
Ms. Tamara McLane

10/5/10 Referenced by Tamara McLane

1300 Franklin Street • P.O. Box 5000 • Vancouver, WA 98666-5000 • tel: [360] 397-2232 • fax: [360] 397-6058 • www.clark.wa.gov

BOARD OF CLARK COUNTY COMMISSIONERS

CLARK COUNTY
WASHINGTON

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Regional Transportation Council
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JUL 27 2010

July 22, 2010

The Southwest Washington Regional Transportation Council (RTC)
c/o Ms. Molly Coston, Chair
1300 Franklin Street, 4th Floor
Clark County Public Service Center
Vancouver, Washington 98666-1366

RE: Fourth Plain Boulevard Becoming a Major Freight Arterial/Corridor

Dear Chair Coston and Council Members:

P-077-001

The Clark County Board of Commissioners has been approached by members of the Shumway Neighborhood Association regarding the increasing volume of freight through established residential neighborhoods.

The Shumway Neighborhood Association has been actively working with the Arnada Neighborhood Association, Hough Neighborhood Association, Fruit Valley Neighborhood Association and the Carter Park Neighborhood Association to prevent Fourth Plain Boulevard from becoming a major freight arterial through these established neighborhoods.

While Clark County understands that the area in question is under the jurisdiction of the city of Vancouver, the concerned home and property owners are also located in Commissioner District 3. Thus, their outreach to the Clark County Board of Commissioners.

The Board of Commissioners respectfully asks RTC to include in its current work program a comprehensive freight access study of the entire transportation network west of and in connection with Interstate-5. We further respectfully ask all RTC member organizations to understand these well established residential neighborhoods' concerns for their livability, not to mention potential affects on home and/or property value if Fourth Plain Blvd.'s designation should change. We would hope (1) RTC staff will actively include and work with all of the neighborhood associations and (2) that this work would be completed before any public conversation about the proposed change in Fourth Plain's designation.

Sincerely,

Steve Stuart, Chair | Tom Mielke | Marc Boldt

1300 Franklin Street • P.O. Box 5000 • Vancouver, WA 98666-5000 • tel: [360] 397-2232 • fax: [360] 397-6058 • www.clark.wa.gov

10/5/10 Referenced by Tamara McLane

Hines, Maurice

From: Sharonnasset [sharonnasset@aol.com]
Sent: Monday, October 24, 2011 10:03 PM
To: Columbia River Crossing
Subject: Public Comments Environmental Impact Statement concerning the Columbia River Crossing project. -4
Attachments: non-compliance -4.doc

P-078-001

Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

CRC are seeking non-compliance waves when other project stay in-compliance

The reasons that CRC staff continues to tell committees, citizens, and elected official including members of Congress that the Third Bridge was studied, are ….It was brought in during NEPA Scoping and CRC documents state all reasonable alternative brought in during scoping must be thoroughly studied this is one of the reasons opponents state the NEPA process has not been followed, and a Supplemental Environmental Impact Statement must be started immediately. AND the CRC is seeking wavers from Federal Agencies for non-compliance on issue of Marine Navigation, Aviation, and Historic 4(f) problems that require looking for alternative that stay in compliance.

1. A range of alternatives thoroughly studied though construction is required in the NEPA process, no range of alternatives, equal to the current Locally Preferred Alternatives was studied.

P-078-002

2. The CRC Locally Preferred Alternative removes up to 20 Historical Resources and 11/2 to 2 acres of the Historic Fort Vancouver Reserve, and challenges Pearson Airport airspace. If it is Feasible or Prudent to avoid 4(f) Historic Resource it is required for Federal funding. CRC does not qualify for federal funding.

P-078-003

3. The Replacement bridge, the current Locally Preferred Alternative, does not meet current marine needs of 110' clearance for water traffic business. The Replacement bridge at 95' is less than the current bridge clearance. The I-205 is 130' and the current I-5 bridges are higher than 130'. The CRC's own original data states that a new bridge should not be less than 110' to keep from having adverse impacts on marine traffic. The Third Bridge approximately 1 mile west of the current bridges can be constructed high enough to handle current and future marine needs.

4. The Replacement bridge (depending on design) will need a waiver from the Federal Aviation Administration because it will enter Portland Airport and

P-078-001

Please see the responses to Ms. Nasset's comments made on the DEIS (P-0781, P-0797, P-0936, P-0977, P-1058, and P-1168), which were published with the Final EIS. Impacts (adverse as well as beneficial) to navigation, aviation and Section 4(f) resources are described in the FEIS. This includes a discussion and disclosure of the project's ability to comply with related regulations, and any regulatory permits and approvals that will be required. Also see responses to Ms. Nasset's other comment letters on the FEIS, P-075 to P-083.

P-078-002

The project has worked hard to avoid historic impacts and minimize the impacts that are unavoidable. The avoidance activities and Section 4(f) impacts are detailed in the FEIS. The project does not "remove up to 40 historical resources." The State Historic Preservation Offices of both states have concurred that the project will have adverse effects to only three historic (National Register eligible) properties. Additionally, the Lucky Lager Warehouse is currently shown as displaced in the FEIS. Though it is on the Clark County Heritage Register, it has not been deemed National Register eligible. As the designs are refined, the project will continue to seek ways to avoid and minimize impacts to historic properties. The project will also have an effect on numerous archaeological sites, as documented in Section 3.8 of the FEIS.

P-078-003

The project conducted a series of studies and stakeholder outreach to determine the appropriate navigation clearance for the proposed bridges. Many factors were considered to determine the navigation clearance for the proposed bridges across the Columbia River. In addition to vessel height, the safe and efficient operation of aviation (Pearson Field), highway, light rail, and the multi-use path (bicycle and pedestrian) were considered.

P-078-003

Pearson Airport airspace. The Third Bridge approximately 1 mile west of the current bridges can be constructed without entering into the airports' airspace.

P-078-004

5. CRC Need and Purpose Statement requires the state to avoid impacts on private property, business, and communities. CRC is removing or impacting up to 280 piece of property full or particle on Jantzen Beach - up to 29 homes, 39 businesses and added congestion on I-5 Freeway. Third Bridge alignment on Jantzen Beach is bare vacant and publicly owned land and without interruption on the existing transportation system. Several of the properties are values at millions of dollars.

Molly Coston, the former Chair of RTC, signed the letter understanding you will be calling to verify the letter. Council Member Coston phone number is 360.608.0462.

The former Chair of the Clark County Board of Commissioner Steve Stuart signed the letter understands you will be calling to verify. 360.397.2232

P-078-005

Please ask the CRC representative to provide data of a thorough study of a 6-lane freeway with 2 managed lanes, and high speed rail alignment, with the freeway attaching to I-5 at Mill Plain, going into the Port of Vancouver and connecting to HWY-30 near Linnton OR. The data is to be credible and verifiable, with on and off ramps at each arterial crossing.

Sharon Nasset
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Thirdbridgenow.com

Sharon Nasset
CEO Third Bridge Now
503.283.9585
Sharonnasset@aol.com

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*** IMPORTANT: Do not open attachments from unrecognized senders ***

CRC conducted studies of current river usage and validated these studies through stakeholder outreach to determine what clearances are required by current river users. These efforts included a Boat Survey to identify the types of vessels that use the Columbia River at the project location, their frequency of usage and required navigation clearance. Additionally, a series of telephone and/or face-to-face interviews were conducted with river users to validate and update the information contained in the Boat Survey. Along with these efforts, the United States Coast Guard (USCG) held a preliminary hearing on the Columbia River Crossing to solicit comments from river users.

The information gathered from the above mentioned studies and stakeholder outreach was considered in conjunction with the operational statutes for nearby Pearson Field and with requirements for safe and efficient operation of the proposed highway, light rail, and multi-use path facilities. Taking all of these considerations into account, it was determined that a 95-foot vertical clearance will allow all but a couple of infrequent river users to navigate beneath the bridge at all times of year. These infrequent river users include marine contractors and a few sailboats. However, it is possible for contractors to partially disassemble equipment so they could pass beneath a 95-foot vertical clearance.

The protection of Pearson Field, although important from the perspective of historic resource protection, the local economy, the provision of public services, and preferences stated by the City of Vancouver, is not the only factor influencing bridge heights over the Columbia River. Possible intrusions into Portland International Airport airspace, maintenance of marine navigation, construction staging, maintaining I-5 traffic, and constraints imposed by the location and alignment of the river crossing all constrain the ultimate design of the bridge.

Since the publication of the DEIS, the Urban Design Advisory Group (UDAG) met multiple times to discuss the design of the bridges and

Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

CRC are seeking non-compliance waves when other project stay in-compliance

P-078-006

The reasons that CRC staff continues to tell committees, citizens, and elected official including members of Congress that the Third Bridge was studied, are ….It was brought in during NEPA Scoping and CRC documents state all reasonable alternative brought in during scoping must be thoroughly studied this is one of the reasons opponents state the NEPA process has not been followed, and a Supplemental Environmental Impact Statement must be started immediately. AND the CRC is seeking wavers from Federal Agencies for non-compliance on issue of Marine Navigation, Aviation, and Historic 4(f) problems that require looking for alternative that stay in compliance.

1. A range of alternatives thoroughly studied though construction is required in the NEPA process, no range of alternatives, equal to the current Locally Preferred Alternatives was studied.

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Sharon Nasset

ultimately endorsed the two-bridge concept in January 2009 and also endorsed the open-web concept in September of 2009. The Project Sponsors Council endorsed a two-bridge option in June of 2009, and also endorsed the Pedestrian and Bicycle Advisory Committee recommendations for a covered pathway with the conditions of the maintenance and security plan in September of 2009. Then in February 2011, the CRC Bridge Review Panel recommended that the project discontinue work on the open-web concept and instead select either a composite deck truss, tied arch or cable-stayed bridge type. Following additional analysis and outreach, the governors announced the selection of the composite deck truss as the preferred bridge type in April 2011.

For a more detailed description of the limitations and opportunities that influenced the bridge type selection process, please see Technical Screening Study Final Report December 2008, Aesthetic Screening Study Final Report March 2009, Final Type Study Report October 2009, CRC Project Bridge Review Panel Report, February 2011, CRC: Key Findings and Recommendation Related to Bridge Type, February 2011 and the memo from the governors offices – Moving Forward; CRC Background, Bridge-type Major Factors, Next Steps, April 2011. Much of this information is also summarized in Chapter 2 of the FEIS.

P-078-004

The vision and values of the CRC are used to help guide how the CRC address the Purpose and Need (found in Section 1.5 of the FEIS). The values related to property acquisitions include:

- Supporting a healthy and vibrant land use mix of residential, commercial, industrial, recreational, cultural, and historic areas.
- Recognizing the history of the community surrounding the I-5 BIA, supporting improved community cohesion, and avoiding neighborhood disruption.
- Ensuring the fair distribution of benefits and adverse effects of the project for the region, communities, and neighborhoods adjacent to

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CEO Third Bridge Now
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Sharonnasset@aol.com

the project area.

Since the publication of the DEIS in May of 2008, and the selection of the LPA by project partners in July 2008, the CRC project team has been working to minimize the potential property impacts associated with the project's improvements. Though the project team has been working to stay within the existing right-of-way, some property right acquisitions will be unavoidable. Property owners will receive just compensation for the estimated value of land and improvements acquired and for other impacts that result in a measurable loss of value to the remaining property. Following the publication of the FEIS, property owners will be notified of impacts to their property and acquisition negotiations will begin. The acquisition and relocation process will follow The Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970 (as amended).

Alignments associated with a new river crossing were analyzed and dismissed in the screening process, as described in Section 2.7 of the FEIS.

The CRC project team has worked with RTC and project partners throughout the NEPA process.

P-078-005
Please see the response to Ms. Nasset's other FEIS comment letters, P-075 to P-083.

P-078-006
This is a repeat of comments P-078-001 through P-078-005, to which responses have been provided.

Hines, Maurice

From: Sharonnasset [sharonnasset@aol.com]
Sent: Monday, October 24, 2011 10:31 PM
To: Columbia River Crossing
Subject: formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project. -5
Attachments: CRC_Questions_Letter-March-2011.pdf; Budget_note_ODOT.pdf; Benton_and_Congressman(3).pdf; Note, HJM-22 benton -5.doc

P-079-001

Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

March 28, 2011 JMH-22 a "ceremonial letter" in support for the CRC's Locally Preferred Alternative from the Oregon Legislators was in committee. The CRC did not receive a letter of support out of committee.
Instead of a "ceremonial letter" of support a "note" of requirements for the project was attached at the Ways and Means Committee.

Twenty Members of the Oregon House of Representatives, Democratic and Republican have signed a letter to the House Committee on Transportation and Economic Development "We believe that there are important unresolved questions that demand further scrutiny" I have attached the entire letter. The Oregon House Members stated two concerns of several.

1. Attached a letter of 22 elected officials in who do not want a letter of support

2. Oregon Legislators Representatives and Senate have attached a Note to ODOT budget because of great concern with the CRC process and project.

3. The list of concerns on the ODOT budge include Alternatives, because reasonable alternatives were removed without being studied.

4. Senator Benton and twelve elected officials sent a letter to the Governors' that a range of alternative have not been studied if "port to port" connection (Third Bridge Now) is not studied. They ask for a Supplemental Environmental Impact Statement to be started immediately because a range of alternatives was not studied.

Sharon Nasset
CEO Third Bridge Now

1

P-079-001

Input by citizens, elected officials and other stakeholder on whether or not a Supplemental DEIS should be completed or more NEPA-related studies should be conducted is appreciated. However, it is the responsibility and authority of the federal NEPA lead agencies to determine when a Supplemental EIS or other environmental study is required. See Section 2.7.9 and Appendix O of the FEIS for a discussion of how FTA and FHWA reviewed changes and made determinations regarding supplemental documentation.

The CRC project has supporters and opponents, and has remaining issues to resolve as noted in Ms. Nasset's letter and attachments. Many of the funding questions raised in the attachments have been responded to in the project's updated finance plan (Chapter 4 in the FEIS) while other issues regarding funding remain to be resolved. The key consideration for the FEIS and ROD is that there has been adequate analysis, involvement, documentation and disclosure to allow the completion of the NEPA process. Remaining non-NEPA issues will be addressed during final design.

Please see the response to Ms. Nasset's other FEIS comment letters, including letter P-077, which explains why additional study is not required on the port to port alternative or other similar alternatives.

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Sharonnasset@aol.com

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Washington State Senate

109B Irv Newhouse Building
P.O. Box 40417
Olympia, WA 98504-0417

Senator Don Benton
17th Legislative District

Olympia Ph: (360) 786-7632
District Ph: (360) 576-6059
E-mail: benton.don@leg.wa.gov

February 11, 2009

Dear Governors' Christine Gregoire and Ted Kulongoski, Sponsor Agencies; Southwest Washington Regional Transportation Council and CTRAN,

P-079-001

Attached please find correspondence from Congressman Earl Blumenauer to the Director of the Oregon Department of Transportation, dated January 7, 2009

We would like to thank Congressman Earl Blumenauer for his leadership on the Columbia River Crossing project's need to follow the National Environmental Policy Act (NEPA) requirements, that all alternatives are thoroughly studied. A thorough study of all options to include data is a necessary requirement in the NEPA process. This valuable step in the NEPA process brings the best options to the forefront and creates cooperation between the sponsoring agencies, stakeholders, and taxpayers, and the ability to receive Federal funding for the project.

We are asking that the CRC project immediately commence a Supplemental EIS to fully study the "port-to-port connector" option RC-14.

The foci of the Columbia River Crossing are the economy, safety, and the environment. A thorough NEPA process will create comparable data that will answer questions of cost, land use, environmental justice, mobility, congestion relief, regional freight, the distribution of benefits, and impacts.

In summary, adherence to the National Environmental Policy Act is essential for promoting consensus among various stakeholders and for demonstrating transparency. The I-5 international highway system's importance is internationally known. An open and transparent process is needed to build stakeholders consensus that will propel and help develop this project to completion. A project as important and enormous as the Columbia River Crossing must have transparency and must provide credible comparable data on the "port to port connector."

Financial Institutions, Housing & Insurance, Ranking Member • Government Operations & Elections • Transportation

P-079-001

We the undersigned, as elected officials, and with our constituents' best interests at the forefront of our actions, urge Southwest Regional Transportation Council, CTRAN and the Governors of Oregon and Washington, to direct CRC Project to proceed with a full Supplemental EIS on the "port to port connector" RC-14, starting in March 2009.

Thank you for your immediate attention to this very urgent matter.

Respectfully submitted,

Senator Don Benton
17th District
Member of the
Senator's Joint CRC Oversight Committee

Senator Pam Roach
WA State Senator 31st District

Councilor Pat Campbell
Vancouver City Councilmen #6

Senator Bob Morton
WA State Senator 7th District
Environment, Water & Energy Committee

Commissioner Marc Boldt
Clark County Commissioner
SW WA Regional Transportation Council

Commissioner Jerry Oliver
Port of Vancouver

Commissioner Tom Mielke
Clark County Commissioner
SW WA Regional Transportation Council
CTRAN Board Member

Senator Jim Honeyford
WA State Senator 15th District
Environment, Water & Energy Committee
Ways and Means Committee

Senator Bob Mc Caslin
WA State Senator 4th District
Economic Development Trade and Innovation

P-079-001 **In support of Senator Benton's letter to Governors Christine Gregoire and Ted Kulongoski, Sponsor Agencies; Southwest Washington Regional Transportation Council and CTRAN.**

Representative Bruce Chandler
WA State Representative 15th District
Commerce and Labor Committee
Ways and Means Committee

Senator Larry George
OR State Senator 13th District
Senator's Joint CRC Oversight Committee

EARL BLUMENAUER
THIRD DISTRICT, OREGON

COMMITTEE ON WAYS AND MEANS
SUBCOMMITTEES:
TRADE
SELECT REVENUE MEASURES

COMMITTEE ON BUDGET

Congress of the United States
House of Representatives
Washington, DC 20515-3703

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729 N.E. OREGON STREET
SUITE 115
PORTLAND, OR 97232
(503) 231-2300
FAX: (503) 230-5413

WEBSITE: blumenauer.house.gov

January 7, 2009

Matthew Garrett, Director
Oregon Department of Transportation
355 Capitol Street NE Rm 135
Salem, OR 97301

Dear Director Garrett:

P-079-001

Attached please find correspondence from my constituent, Ms. Sharon Nasset regarding the process for the proposed Columbia River Crossing project. Ms. Nasset is concerned that one option—known as the "port-to-port connector"—was removed from consideration without being subject to a complete NEPA analysis, and leaves the project vulnerable to legal challenges that may result in crippling delays.

Ms. Nasset believes that the CRC project should immediately commence with a supplemental EIS to fully study the "port-to-port connector" option.

As ODOT is one of the agencies leading the efforts on this project, I'm sharing her concerns with you. I would appreciate a response from ODOT or the CRC project addressing how the "port-to-port connector" option was removed from consideration as it relates to the NEPA process.

Thank you for your time and consideration.

Sincerely,

Earl Blumenauer

Earl Blumenauer
Member of Congress

Cc: Sharon Nasset

PRINTED ON RECYCLED PAPER

Dear Congressman Earl Blumenauer,

P-079-001

Thank you for this opportunity to bring our concerns to you. It also has been recommended by locally elected officials that federal elected officials take the lead on this because NEPA is a requirement for federal funding and the NEPA process has not been followed. The National Environmental Policy Act was established to guarantee everyone would have a valued part in construction projects within our United States. It is our understanding that all parties should have an equal part in the decision making of a project. We also understand that all data and information used in the decision making process is to be publicly transparent and available. The NEPA process was established to avoid problems with the few with power subjecting their will over the citizens. The hard work that made justice part of the public works project process will only be followed when our elected officials insist the NEPA process be followed. Therefore, I come before you today asking you to use the power the citizens have given you to work on their behalf to impose justice and insure we, are a land ruled by law.

We see two possible outcomes the way this project is being managed:

1. Connect with CRC and have them follow the NEPA laws or
2. Wait until the Environmental Impact Statement is complete and then deal with Law suits.

If we wait we could face the issues that the "Bridge to Nowhere "faced. Our credibility at the Federal level will be lost and we will have to start over.

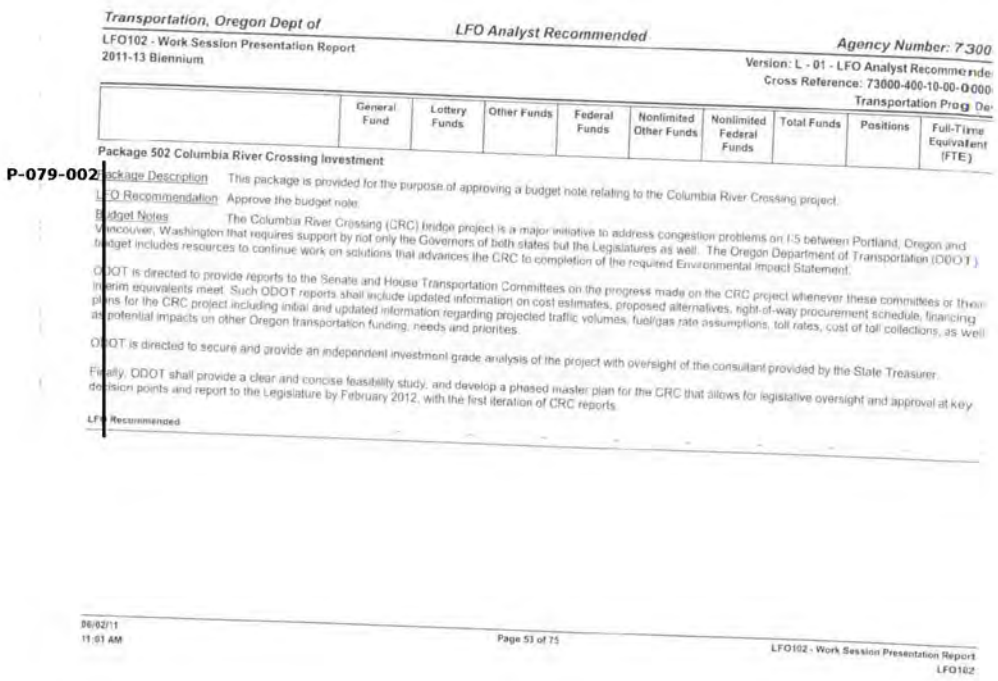
We are providing a list of those on record who have stated that the Replacement Bridge is the wrong project, the NEPA process has not been followed, Open Meetings Laws have been violated and the process needs to be opened to options that were arbitrarily remove by CRC:
Clark County Commissioners, Bike Transportation Alliance, Coalition for a Livable Future, Oregonians In Action, 1000 Friends of Oregon, Cascade Policy Institute, Evergreen Freedom Foundation, Board of Sustainable Future, Osprey, Audubon Society, EPA, Lars Larson, Onward Oregon, Sensible Transportation Solutions, Economic Transportation Alliance, Local Economists, Environmentalist, Metro Councilors, Port Vancouver Commissioner Jerry Oliver, Senator Benton, Representative Jim Dunn, Representative Chip Shields, Senator Larry George, Senator Gary George, Pearson Airport board members, US Fish & Wildlife hatchery division, Clark College Law Department, Professor Will Macht, CRC Sponsor Agencies and 800 taxpayer signatures. This group of tax payers rarely has the opportunity to speak with one voice.

In conclusion we are asking you to require the Columbia River Crossing Project to immediately perform a Supplemental Environmental Impact Study to thoroughly study the Port-to-Port connection RC-14.

Sincerely,

Sharon Nasset

Economic Transportation Alliance



Transportation, Oregon Dept of — LFO Analyst Recommended — Agency Number: 7300

LFO102 - Work Session Presentation Report
2011-13 Biennium

Version: L - 01 - LFO Analyst Recommende
Cross Reference: 73000-400-10-00-0000
Transportation Prog De

	General Fund	Lottery Funds	Other Funds	Federal Funds	Nonlimited Other Funds	Nonlimited Federal Funds	Total Funds	Positions	Full-Time Equivalent (FTE)

Package 502 Columbia River Crossing Investment

P-079-002

Package Description: This package is provided for the purpose of approving a budget note relating to the Columbia River Crossing project.

LFO Recommendation: Approve the budget note.

Budget Notes: The Columbia River Crossing (CRC) bridge project is a major initiative to address congestion problems on I-5 between Portland, Oregon and Vancouver, Washington that requires support by not only the Governors of both states but the Legislatures as well. The Oregon Department of Transportation (ODOT) budget includes resources to continue work on solutions that advances the CRC to completion of the required Environmental Impact Statement.

ODOT is directed to provide reports to the Senate and House Transportation Committees on the progress made on the CRC project whenever these committees or their interim equivalents meet. Such ODOT reports shall include updated information on cost estimates, proposed alternatives, right-of-way procurement schedule, financing plans for the CRC project including initial and updated information regarding projected traffic volumes, fuel/gas rate assumptions, toll rates, cost of toll collections, as well as potential impacts on other Oregon transportation funding, needs and priorities.

ODOT is directed to secure and provide an independent investment grade analysis of the project with oversight of the consultant provided by the State Treasurer.

Finally, ODOT shall provide a clear and concise feasibility study, and develop a phased master plan for the CRC that allows for legislative oversight and approval at key decision points and report to the Legislature by February 2012, with the first iteration of CRC reports.

LFO Recommended

06/02/11
11:01 AM

Page 53 of 75

LFO102 - Work Session Presentation Report
LFO102

P-079-002

Please see response to comment P-079-001 above.

HOUSE OF REPRESENTATIVES
900 COURT ST NE
SALEM, OR 97301

MEMORANDUM

TO: House Committee on Transportation and Economic Development

FROM:

Rep. Jules Bailey	Rep. Chris Garrett
Rep. Phil Barnhart	Rep. Mitch Greenlick
Rep. Katie Eyre Brewer	Rep. Chris Harker
Rep. Ben Cannon	Rep. Mark Johnson
Rep. Brian Clem	Rep. Shawn Lindsay
Rep. Jason Conger	Rep. Mike McLane
Rep. Michael Dembrow	Rep. Mary Nolan
Rep. Margaret Doherty	Rep. Julie Parrish
Rep. Lew Frederick	Rep. Patrick Sheehan
Rep. Tim Freeman	Rep. Carolyn Tomei

DATE: March 28, 2011

RE: CRC Questions

P-079-002

Thank you for scheduling this important hearing on HJM 22. Having reviewed recent correspondence regarding the Columbia River Crossing[1], we believe that there are important unresolved questions that demand further scrutiny before the commitment of additional public dollars to this project.

Raising questions should not be construed as opposition to a new bridge. We are well acquainted with the congestion issues in the I-5 corridor; we recognize the need for major improvements at the Columbia River; and we fully support the effort to secure federal funds. These arguments in favor of a major project, however, are not necessarily arguments for any specific proposal. With respect to the current CRC proposal, at least the following questions deserve further attention.

1. What is the "true cost" of the CRC?

P-079-003

The cost of the CRC is represented to be between $3.2 and $3.6 billion. Impresa argues that the true cost, in year-of-expenditure dollars, is closer to $10 billion over the life of the project after accounting for debt service and the need for improvements to the Rose

[1] We refer to the Oct. 4, 2010 memo from Impresa Consulting; the Jan. 21, 2011 response from ODOT; and the Feb. 7, 2011 reply from Impresa Consulting.

P-079-003

The Oregon Department of Transportation (ODOT) completed Phase I construction of the I-5 Delta Park widening project in fall 2010. Phase I of the project involved widening I-5 and lengthening the entrance and exit ramps at Victory Boulevard and Columbia Boulevard. Phase II involves improving local streets and will begin when funding is secured. Phase I of the Delta Park project widened the current 2-lane segment of southbound I-5 to 3 lanes. There are currently no immediate plans to widen I-5 south of Delta Park. Neither the CRC project nor the Delta Park projects are intended to address the southbound traffic congestion that currently exists near the I-5/I-405 split. However, traffic analyses show the congestion at the split will not be worsened because of the Columbia River Crossing project. The main reason is that fewer cars are expected to cross the river with a project in 2030 than without a project. This is due to the provision of improved transit service and tolling.

Beyond the CRC and Delta Park projects, the I-5 Transportation and Trade Partnership Final Strategic Plan recommended a comprehensive list of modal actions relating to: additional transit capacity and service; additional rail capacity; land use and land use accord; transportation demand/system management; environmental justice; additional elements and strategies (such as new river crossings); and financing. RTC and Metro are tasked with initiating recommendations as part of their regional transportation planning role. Examples of current efforts include RTC's evaluation of future high-capacity transit in Clark County, and evaluation of needs for future river crossings. Regional planners have investigated solutions to existing bottlenecks at the I-5 connections with I-405 and I-84. ODOT is responsible for conducting ongoing studies to identify other congestion problems on I-5 in Oregon that may need to be addressed in the future.

P-079-003

Quarter. CRC responds that the Rose Quarter is a "different" issue. But it appears to be very much in question whether the CRC, absent Rose Quarter improvements, accomplishes much more than shifting the I-5 bottleneck to the south. If Rose Quarter improvements are an essential part of a complete solution to I-5 congestion in the Portland area, then those expenses should be considered in evaluating the true cost, and in presenting the cost to the public.

2. Traffic projections and tolling revenue

P-079-004

The CRC financing plan depends heavily on tolling revenue. The projected revenue from tolling depends, in turn, on projected traffic over the new bridge. The Impresa analysis contends that based on ODOT's own data and assumptions of 1% annual growth, traffic over the CRC will be 30,000 vehicles per day **lower** in 2030 than the DEIS forecast. If this is correct, the less-than-projected tolling revenue results (according to Impresa's analysis) in a debt service **shortfall of $1 billion**.

In the few years since CRC's projections were issued, traffic over the bridge has not only failed to increase as forecast, it has actually declined. Based on the exchange between Impresa and ODOT, there appears to be an empirical dispute about whether the current decline in traffic levels merely reflects the recession or, instead, reflects a longer term "sea change" in how people commute. Impresa points out that the decline in traffic preceded the recession by two full years. We are not aware of a refutation of this point.

CRC/ODOT assert that their projections are based on commonly accepted models; Impresa responds that these models are themselves flawed, and cites examples. We are not aware of a refutation of this point, either.

Finally, ODOT says that there will be an independent, investment-grade study at a future time, before bonding. **If there is an undisputed need for an independent, investment-grade financial analysis,** it should be undertaken before any major commitment of additional public dollars.

3. Cost overruns

P-079-005

Critics assert that CRC's cost estimate of $3.2-3.6 billion is low by at least hundreds of millions of dollars, given the likelihood of cost overruns in a project such as this.

Cost overruns are a fact of life and should not be taken by themselves as a reason to oppose the project. However, the magnitude of possible overruns should be considered in conjunction with the significant questions about the CRC's traffic and tolling projections. If we are materially off-target on *both* projected costs and projected revenues, this could create enormous downside exposure for Oregon taxpayers. We are not satisfied that this downside risk has been fully digested.

Thank you for your consideration of these issues.

P-079-004

At Governor Kitzhaber's request, the Oregon State Treasurer conducted an independent review of the CRC's financing plan and released a report in July 2011. CRC incorporated the treasurer's recommendation in Chapter 4 of the Final EIS. The Investment Grade Tolling Analysis will follow, and must follow, the Record of Decision.

P-079-005

Past financial performance is an important issue but is not relevant to the NEPA review process. The Record of Decision concludes the NEPA analysis. It indicates which alternative has been selected by the federal government, and allows for the continued design, eligibility for federal funding and permitting, and eventual construction of that alternative. The Locally Preferred Alternative is supported by local, regional, state, and federal agencies and has been selected following an exhaustive analysis and public involvement program.

The project takes the issues of financial management very seriously. Project staff have provided Ms. Nasset with considerable records and reports and has responded to her inquiries. The project is currently developing new financial reporting mechanisms and has started providing monthly reports on the internet. The project will continue to work with the public to improve transparency and an understanding of the resources required for an undertaking of this scale.

Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

P-079-006

March 28, 2011 JMH-22 a "ceremonial letter" in support for the CRC's Locally Preferred Alternative from the Oregon Legislators was in committee. The CRC did not receive a letter of support out of committee.
Instead of a "ceremonial letter" of support a "note" of requirements for the project was attached at the Ways and Means Committee.

Twenty Members of the Oregon House of Representatives, Democratic and Republican have signed a letter to the House Committee on Transportation and Economic Development **"We believe that there are important unresolved questions that demand further scrutiny"** I have attached the entire letter. The Oregon House Members stated two concerns of several.

1. Attached a letter of 22 elected officials in who do not want a letter of support
2. Oregon Legislators Representatives and Senate have attached a Note to ODOT budget because of great concern with the CRC process and project.
3. The list of concerns on the ODOT budge include Alternatives, because reasonable alternatives were removed without being studied.
4. Senator Benton and twelve elected officials sent a letter to the Governors' that a range of alternative have not been studied if "port to port" connection (Third Bridge Now) is not studied. They ask for a Supplemental Environmental Impact Statement to be started immediately because a range of alternatives was not studied.

Sharon Nasset
CEO Third Bridge Now
503.283.9585
Sharonnasset@aol.com

P-079-006

These comments repeat the comments provided on page 1 of Ms. Nasset's submittal, responses are provided above.

The Columbia River Crossing Does Not Qualify for Federal Funding

For the following reasons:

P-080-001
1. A range of highway and transit alternatives thoroughly studied though construction. With cost, benefit, and impacts identified has not taken place

2. Reasonable alternatives accepted into the NEPA Scoping process were removed without consideration or study.

3. 4(f) Historic Resource avoidance if it is prudent or feasible to construct in a different place. It is both prudent and feasible to construct the Third Bridge "port to port" connector. The Columbia River Crossing current "Locally Preferred Alternative" removes up to 20 Historical properties. The Third Bridge was removed from the process without being considered.

4. Purpose and Needs avoidance of impacts to I-5 freeway, residential, retail, and commercial area is not being followed. There are several less impacts with a Third Bridge Alignment avoidance of 4(f) Historic Resources, no construction congestion on I-5 Freeway, removes traffic from I-5, fewer impacts in downtown Vancouver, no removal of business and residences on Jantzen Beach, in Oregon it is mostly bare, vacant, and publicly own land.

P-080-002
5. No No-Build Alternative or Baseline applied to project. No-Build Alternative as required was not developed or studied. NO ACTION is different than a No-Build Alternative

P-080-003
6. Light rail does not go to the 5 key service area's. To service an area the location must be with in ½ mile of the High Capacity Transit stop. Only one area is serviced the central city. The central city location is not a destination it is a transfer for regional and other areas.

P-080-004
7. Navigational safety issues of marine and airspace are not constrained with the Third Bridge located 1 mile further west from the current bridges.

P-080-005
8. Cost and Benefit anlysis has not been complete on this project. Vacant land cost less than buying property, removing people, removing business, residents, and preparing the land for construction. Up to 7 years of construction on I-5 freeway will damage the national economy as well as the region and our two States. Putting money into infrastructure not into tearing down properties currently in use.

Thank you, kindly
Sharon Nasset Third Bridge Now . com

P-080-001

Please see Chapter 5 of the FEIS for the Section 4(f) Evaluation. The "Avoidance Alternatives" discussion starts on page 5-60. Also see the responses provided to Ms. Nasset's comments made on the DEIS, and the response to Ms. Nasset's FEIS comment letters P-077 and P-079.

P-080-002

A No-Build Alternative was studied in the DEIS and FEIS. See description of the No-Build Alternative in Section 2.4 of the FEIS, and analysis of impacts in Chapter 3.

P-080-003

The light rail alignment associated with the LPA was chosen by project partners to maximize ridership and to offer an alternate means of transportation to driving a vehicle in the I-5 corridor. It is expected that the CRC project will qualify for federal funding.

P-080-004

The Bi-State Industrial Corridor does not adequately meet the project's purpose and need. Also see responses to Ms. Nasset's other FEIS comment letters, including P-077.

P-080-005

The project has completed a benefit cost analysis. It can be reviewed at, or a copy obtained from, the project office.

Economic impacts, as well as the impacts and costs associated with property acquisition and relocation, are discussed in the FEIS.

Hines, Maurice

From: Sharonnasset [sharonnasset@aol.com]
Sent: Monday, October 24, 2011 10:57 PM
To: Columbia River Crossing
Subject: formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project. -7
Attachments: Disclaimer.-7doc.doc

P-081-001

Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

The CRC has used maps that are not guaranteed or warrant by the States of Oregon or Washington and it agents….. many of the maps are inaccurate and CRC staff has been informed that their maps are not accurate…… CRC staff has used these maps to send to the FTA and FHWA. Have CRC provide maps showing the I-5 Corridor and the I-5 Bridge Influence Area that are guaranteed . You will find that the the CRC can not use the dame maps because they made false statement with the earlier maps.

Sharon Nasset
CEO Third Bridge Now
503.283.9585
Sharonnasset@aol.com

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

P-081-001

It is not clear what maps or errors Ms. Nasset is referring to in this comment, or how they may have affected any findings.

Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

P-081-001 The CRC has used maps that are not guaranteed or warrant by the States of Oregon or Washington and it agents….. many of the maps are inaccurate and CRC staff has been informed that their maps are not accurate…… CRC staff has used these maps to send to the FTA and FHWA. Have CRC provide maps showing the I-5 Corridor and the I-5 Bridge Influence Area that are guaranteed . You will find that the the CRC can not use the dame maps because they made false statement with the earlier maps.

Sharon Nasset
CEO Third Bridge Now
503.283.9585
Sharonnasset@aol.com

Miles

Geographic Data Standards:
Projected Coordinate System:
State Plane - Washington South
Units: US Foot

Data Source(s):
I-5 Partnership data compiled by Metro October 2005

Contact Information:
Columbia River Crossing Project
700 Washington St.
Suite 300
Vancouver, WA 98660
(360) 737-2726
(503) 256-2276

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Columbia River CROSSING

Hines, Maurice

From: Sharonnasset [sharonnasset@aol.com]
Sent: Monday, October 24, 2011 11:20 PM
To: Columbia River Crossing
Subject: formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project. -9

P-082-001

Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

1. CRC staff made false statement in Screening A . The BNSF rail bridge is outside of the I-5 Corridor when it known as the heart of the I-5 Corridor.

2. CRC staff made false statements about the location of the I-5 Bridge Influence Area. After giving staff information the hide data…. Change maps and then started calling the area a new name…. Project area.

3. Maps and data have been handed in…. then CRC staff removed and falsify data.

Sharon Nasset
CEO Third Bridge Now
503.283.9585
Sharonnasset@aol.com

P-082-001

Please see the responses to Ms. Nasset's comments made on the DEIS (P-0781, P-0797, P-0936, P-0977, P-1058, and P-1168), which were published with the Final EIS.

Note that whether the BNSF rail bridge is labelled as being "outside" or "inside" the "I-5 corridor" is not the factor that determines its suitability as an alignment for a highway, rail, transit or bicycle and pedestrian crossing. The critical factor was the performance of a given crossing location, as determined through the alternatives evaluation process. Please see the response to Ms. Nasset's FEIS comment letter P-077.

Hines, Maurice

From: Sharonnasset [sharonnasset@aol.com]
Sent: Monday, October 24, 2011 11:51 PM
To: Columbia River Crossing
Subject: formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project. -10
Attachments: OpenHouseBoardsJan2007.pdf

P-083-001

Add this to the formal Public Comments Environmental Impact Statement concerning the Columbia River Crossing project.

The Purpose and Need Statement and the Project Area map do not agree with each other….. the Purpose and Needs Statement say the "center of the project area is the two deep water ports a the transcontinental rail line."
The Project Area maps do not include the ports and the rail line! It make the I-5 freeway the center of the project area..!!

CRC staff continue to use the words I-5 Freeway and I-5 Corridor as the same…… the I-5 Corridor in our region has specific location boundaries. CRC uses the I-5 Freeway and I-5 Corridor to confuse people and to be dishonest.

See the attached project maps……

Sharon Nasset
CEO Third Bridge Now
503.283.9585
Sharonnasset@aol.com

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

P-083-001

Please see the responses to Ms. Nasset's comments made on the DEIS (P-0781, P-0797, P-0936, P-0977, P-1058, and P-1168), which were published with the Final EIS.

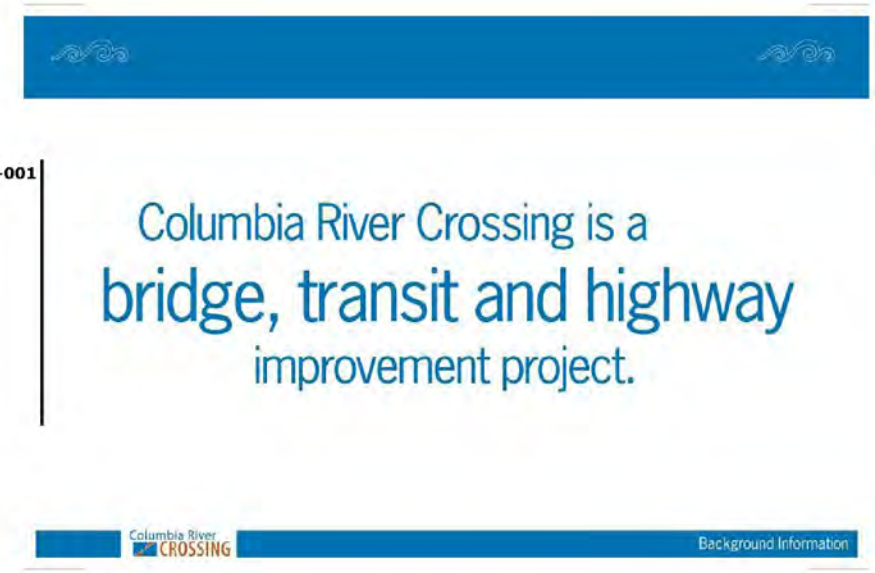
The purpose and need was written broadly enough to allow alternatives well outside the immediate I-5 alignment to be considered and evaluated. However, the early screening process demonstrated that building a new crossing in a new corridor, in lieu of improving the existing I-5 crossing, would fail to meet basic elements of the project's purpose and need. This narrowing of alternatives meant that the DEIS alternatives could be shown on maps with a more focused geographic scope than could the broad range of potential alternatives that were considered in early screening.

Please also see the responses to Ms. Nasset's other FEIS comment letters, P-075 to P-082.

P-083-001


Project Area
N
Vancouver
Portland
Washington
Oregon
Columbia Blvd.
Columbia River CROSSING
Background Information

P-083-001


Columbia River Crossing is a
bridge, transit and highway
improvement project.
Columbia River CROSSING
Background Information

P-083-001


Leading the Project and
Other Project Partners
Oregon Department of Transportation
Washington State Department of Transportation
City of Vancouver
City of Portland
Metro
Regional Transportation Council
C-TRAN
TriMet
Columbia River CROSSING
Background Information

P-083-001


2002 I-5 Partnership Recommendations
Partnership
Fix Three I-5 Bottlenecks
I-5 Salmon Creek in Vancouver – Completed 2006
Delta Park in Portland – Construction begins 2008
The Interstate Bridge and nearby interchanges – Environmental Impact Statement phase complete 2008-2009
Columbia River CROSSING
Background Information

P-083-001

What are the Problems?



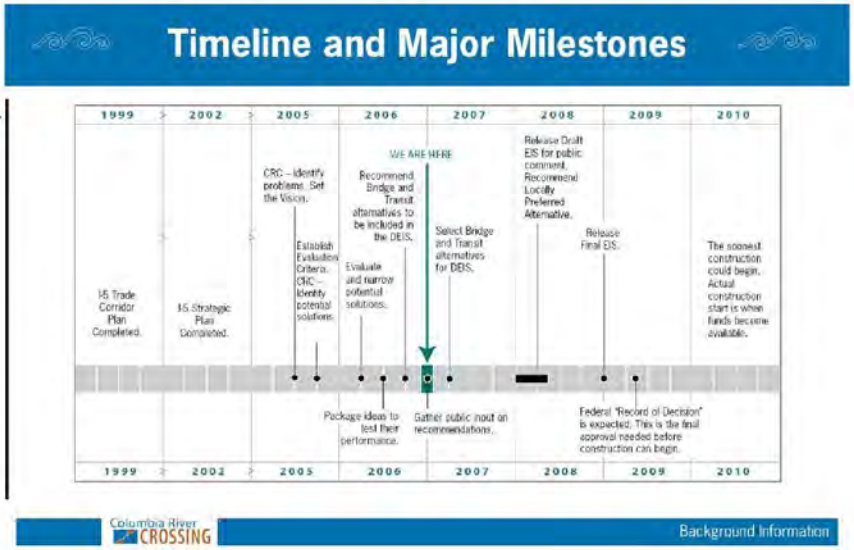


- This segment of I-5 currently suffers four to six hours of congestion a day
- If no improvements are made, congestion will increase to 16 hours a day by the year 2030
- Transit and freight get bogged down in this same congestion
- Short on and off ramps contribute to a high accident rate
- Poor sight distance approaching and on the bridge contributes to rear-end crashes
- During bridge lifts, crash rates increase three to four times
- The bike and pedestrian path is narrow, indirect and hard to find
- The bridge does not meet current earthquake standards

P-083-001


Timeline and Major Milestones
Congestion
Transit
Highways
Freight
Efficiency
Pedestrian
Bicycle
River Crossing
1
Identify problems • Set the Vision • Establish Evaluation Criteria
2
Identify range of potential solutions
3
Screen ideas based on evaluation criteria • Narrow solutions
4
Combine ideas into packages • Test their performance
We Are Here
5
Select alternatives to be analyzed in the Draft Environmental Impact Statement
6
Release Draft EIS for public comment • Identify Locally Preferred Alternative
Begin Construction
7
Complete Final EIS • Secure Federal Approval
Columbia River CROSSING
Background Information

P-083-001


Timeline and Major Milestones
1999
2002
2005
2006
2007
2008
2009
2010
I5 Trade Corridor Plan Completed.
I5 Strategic Plan Completed.
CRC – identify problems. Set the Vision.
Establish Evaluation Criteria. CRC – identify potential solutions.
Evaluate and narrow potential solutions.
Recommend Bridge and Transit alternatives to be included in the DEIS.
WE ARE HERE
Select Bridge and Transit alternatives for DEIS.
Release Draft EIS for public comment. Recommend Locally Preferred Alternative.
Release Final EIS.
The soonest construction could begin. Actual construction start is when funds become available.
Package ideas to test their performance.
Gather public input on recommendations.
Federal "Record of Decision" is expected. This is the final approval needed before construction can begin.
Columbia River CROSSING
Background Information

P-083-001


Evaluating Options and Making Progress
Initial Screening
River Crossing Options
Transit Options
Narrowed to
We Are Here
Preliminary Alternatives
River Crossing Options
Transit Options
*Above options were combined into 12 packages for testing.
Narrowed to
Staff Recommendations
River Crossing Options
Replacement Bridge: Downstream/Mid-level
Replacement Bridge: Upstream/Mid level
Transit Options
Bus Rapid Transit (BRT) with Express Bus service
Light Rail Transit (LRT) with Express Bus service
Other Issues to Address in Draft Environmental Impact Statement
Bus Rapid Transit/Light Rail Transit alignments and station locations
Freight improvements
Transportation System efficiencies
Bicycle / pedestrian improvements
Air quality, noise reduction
Environmental effects
Cultural and historical resource protection
Managed lanes
Tolling
Bridge type, appearance, and alignment (upstream or downstream)
Columbia River CROSSING
Background Information

P-083-001

The Interstate Bridge Facts

The Interstate Bridge is actually two bridges.

Northbound
Built in 1917, listed on National Register of Historic Places
Southbound
Built in 1958 to match the first bridge

Both bridges were financed with tolls
1917 – 5 cents. The bridge was paid off and tolls removed in 1929.
1958 – 20 to 60 cents (roughly = $2.60 today), depending on the vehicle type. The bridge was paid off and tolls removed in 1966.



Columbia River CROSSING
Background Information

P-083-001


We Are At an Important Decision Point
The ideas that advance will be analyzed in detail in the Draft Environmental Impact Statement.
Columbia River CROSSING
Key Decision Point

P-083-001

We Recommend These River Crossing and Transit Ideas



Advance these ideas for detailed analysis in the Draft Environmental Impact Statement

River Crossing

- Replace the existing bridges with a new I-5 bridge to carry highway traffic, transit, bicycles and pedestrians.

Transit

- Bus Rapid Transit with express bus service
- Light Rail Transit with express bus service

Columbia River CROSSING

Key Decision Point

P-083-001

Bridge Recommendation



Replace the Interstate Bridge with a new structure

High enough to avoid bridge lifts

Low enough to avoid Pearson Airpark airspace

Either immediately downstream or upstream of current I-5 Bridge

Columbia River CROSSING

Key Decision Point

P-083-001


Why Do We Need a New I-5 Bridge?
More Predictable Travel Times
for People, Transit, Goods
Columbia River CROSSING
Key Decision Point

Why Do We Need a New Bridge?

P-083-001



Improves Safety and Capacity

Adds lanes for safe traffic operations and improved travel times

Fixes short on and off ramps along I-5

Improves sight distance

Adds safety shoulders

Provides wider lanes and better connections for bicyclists and pedestrians

Reduces river navigation obstacles for boats and tugs

Columbia River CROSSING

Key Decision Point

P-083-001

Why Remove the Existing Bridge?

Fewer Impacts

One bridge creates a smaller footprint on land and water than two

Stormwater run-off will be collected and treated, meaning cleaner water

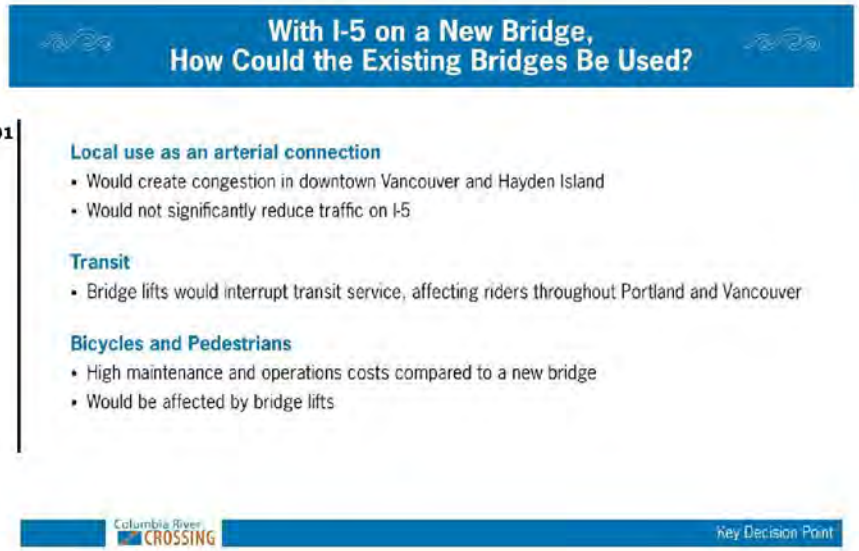
Fewer bridge piers have less impact on fish habitat

Less cut-through traffic through downtown Vancouver and Hayden Island



Columbia River CROSSING

Key Decision Point


With I-5 on a New Bridge,
How Could the Existing Bridges Be Used?
P-083-001
Local use as an arterial connection
• Would create congestion in downtown Vancouver and Hayden Island
• Would not significantly reduce traffic on I-5
Transit
• Bridge lifts would interrupt transit service, affecting riders throughout Portland and Vancouver
Bicycles and Pedestrians
• High maintenance and operations costs compared to a new bridge
• Would be affected by bridge lifts
Columbia River CROSSING
Key Decision Point

P-083-001

Why Remove the Existing Bridge?

Lower Operations and Maintenance Costs

It is expensive to operate and maintain the bridge lifts



Columbia River CROSSING

Key Decision Point

P-083-001

River Crossing – What's Out?

We evaluated the following ideas. They did not perform well enough to advance for further study.

- Movable lift span
- Tunnel to replace or supplement I-5
- High-level bridges
- New corridor crossing
- New corridor crossing plus widening existing I-5 bridges
- New western highway (I-605)
- New eastern crossing
- 33rd Avenue crossing
- I-205 improvements
- Arterial crossing without I-5 improvements
- Supplemental Bridge – Upstream – Midlevel
- Non-freeway multimodal crossing
- Double deck crossing



Columbia River CROSSING

Key Decision Point

P-083-001

Transit Recommendations



Bus Rapid Transit



Light Rail Transit

Bus Rapid Transit with express bus service
Light Rail Transit with express bus service

Both Bus Rapid Transit and Light Rail Transit are recommended because they:

- Have potential to reduce congestion on I-5
- Have the best potential to meet forecasted transit demand for the year 2030
- Address transit issues identifed in project's Purpose and Need Statement

Express bus service would provide direct access between suburban Clark County and downtown Portland during peak commute hours.

Columbia River CROSSING

Key Decision Point

P-083-001

Transit



Bus Rapid Transit



Light Rail Transit

CRC recommends advancing Bus Rapid Transit and Light Rail Transit

Potential to meet a growing population's travel demands

Provide reliable travel time

Increase transit use

Provide improved access to employment and commercial centers

Support local and regional transportation and land use plans

Columbia River CROSSING

Key Decision Point

P-083-001

What is Bus Rapid Transit?

Specially designated buses that can:

Use designated transit stations or platforms

Operate in a lane separate from regular traffic in some areas

Have the flexibility to travel on regular roads

Provide high passenger capacity

Operate as quiet, low emission vehicles

Provide fast, frequent and reliable all day service



Columbia River CROSSING

Key Decision Point

P-083-001

What is Light Rail Transit?

Rail-based vehicles that can:

Use designated transit stations or platforms
Operate in its own dedicated guideway
Provide high passenger capacity
Operate as quiet, low emission vehicles
Provide fast, frequent and reliable all day service



Columbia River CROSSING

Key Decision Point

P-083-001


Alternatives for
Draft Environmental Impact Statement
Bridge and Transit Recommendations will be combined with other project elements (interchanges, freight, bicycle and pedestrian and other improvements, as well as demand management) to form project alternatives.
• No action. This alternative is required for any Draft Environmental Impact Statement (DEIS) process as a baseline for comparison with other alternatives.
• Replacement Bridge and Bus Rapid Transit with Express Bus service.
• Replacement Bridge and Light Rail Transit with Express Bus service.
Columbia River CROSSING
Key Decision Point

P-083-001


What is a Draft Environmental Impact Statement?
A Draft Environmental Impact Statement is a summary of the expected impacts each project design, or "alternative," is likely to have on the surrounding area. This process:
• Is required of all federally funded projects
• Considers all benefits and impacts on the surrounding area of proposed project alternatives
• Analyzes a range of reasonable project designs, or "alternatives"
• Provides an intense and thorough process of analysis for each proposed alternative
• Shows compliance with environmental regulations
The National Environmental Policy Act (NEPA) is a federal law that regulates the decision-making processes of federally funded projects. The purpose of NEPA is to help ensure that public projects address the needs of the community while avoiding, minimizing or mitigating for negative impacts on human and natural environments.
For more information: http://www.environment.fhwa.dot.gov/projdev/index.asp
Columbia River CROSSING
Key Decision Point

P-083-001

Transit – What's Out?

These ideas did not perform well enough in the evaluation to advance for further study.

- Streetcar
- High-speed Rail
- Ferry Service
- Monorail System
- Magnetic Levitation Railway
- Commuter Rail in BNSF Trackage
- Heavy Rail
- Personal Rapid Transit
- People Mover / Automated Guideway Transit (AGT)


High-Speed Rail


Ferry Service


Magnetic Levitation Railway


People Mover/ Automated Guideway Transit

Columbia River CROSSING

Key Decision Point

P-083-001


Evaluation Criteria
The recommended River Crossing and Transit options performed better on nearly all of the evaluation criteria adopted by the CRC Task Force:
1. Community Livability and Human Resources
2. Mobility, Reliability, Accessibility, Congestion Reduction, and Efficiency
3. Modal Choice
4. Safety
5. Regional Economy / Freight Mobility
6. Stewardship of Natural Resources
7. Distribution of Benefits and Impacts
8. Cost Effectiveness and Financial Resources
9. Growth Management, Land Use
10. Constructability
Columbia River CROSSING
Key Decision Point

How Do I Leave Comments Today?

P-083-001



- Write your ideas on a green comment form
- Type them out at a laptop computer station
- Dictate them at the verbal comment station

Columbia River CROSSING

P-083-001


Other topics in 2007
The Draft Environmental Impact Statement will address these issues in 2007.
Public transit – Where should it go? Where should we build stations and "park 'n' rides"?
Freight improvements – at interchanges for connections and safety
Efficiencies – ideas like ramp meters, incident response, ridesharing, telecommuting
Bicycle / pedestrian improvements
Air quality, noise reduction
Environmental effects – water quality issues
Cultural and historical resource protection
Managed lanes
Tolling
Bridge type, appearance, and alignment (upstream or downstream)
We will continue to seek your input regarding these topics
Columbia River CROSSING
Next Steps

P-083-001


Talk With Us
Contact us with your comments, questions and ideas.
E-MAIL feedback@columbiarivercrossing.org
MAIL 700 Washington St., Suite 300, Vancouver, WA 98660
FAX 360-737-0294
PHONE 360-737-2726 or 503-256-2726
WEB www.columbiarivercrossing.org
PODCAST www.wsdot.wa.gov/inform/downloads/ColumbiaRiverCrossing.mp3
Columbia River CROSSING
Public Comment


How Public Involvement has Informed the Project
P-083-001
Public comments have helped shape each decision step:
Generating ideas: Fall 2005
Evaluating ideas & narrowing options: Spring 2006
Preliminary design workshops: Summer/Fall 2006
Bridge and Transit options: November 2006 – February 2007
Columbia River CROSSING
Public Comment

P-083-001

We Heard You!

Examples of how your ideas have helped shape the CRC project.



You said:
Places in our neighborhoods like grocery stores, parks, houses of worship, schools, and trails are important assets.

We are:
Continually updating our neighborhood resource maps to help the project avoid or minimize impacts.

You said:
Host a January open house on Hayden Island.

We are:
Tuesday, January 30, 2007
6:30 – 8:30 p.m.
12050 N. Jantzen Drive
(the former Hayden Island Yacht Club)

Columbia River CROSSING Public Comment

P-083-001

We Heard You!

Examples of how your ideas have helped shape the CRC project.



You said:
- Express bus service and
- A non-stop ride between Clark County and Portland are essential.

We are:
Recommending express bus service in both transit options.

You said:
- Make travel safe and easy for freight.

We are:
Designing flatter grades and gentler curves at key freight onoff ramps: e.g., Mill Plain and Marine Drive.

Columbia River CROSSING

Public Comment

P-083-001

We Heard You!

Examples of how your ideas have helped shape the CRC project.



You said:
- Safe and easy access to bike and pedestrian connections are vital to the project.

We are:
Analyzing the best ways to make these connections.

You said:
- Avoid conflicts with river and air traffic.

We are:
Recommending a bridge without a lift span which avoids aviation air space.

Columbia River CROSSING

Public Comment

Hines, Maurice

From: andrew neerman [blueruinpdx@gmail.com]
Sent: Monday, October 24, 2011 8:41 PM
To: Columbia River Crossing
Subject: FEIS Comment

P-084-001

I am writing to express my opposition to the CRC as currently conceived. This is a bloated freeway-expansion project that will encourage sprawl in Clark County, greatly worsen the bottleneck at the Rose Quarter, and potentially send many more vehicles onto surface arterials in North and Northeast Portland (areas that have already suffered greatly due to freeway construction, misguided "urban renewal", racism, economic disadvantage, and environmental injustice). It is grossly out of step with the contemporary priorities and values of this region and I strongly urge the Federal Highway Administration and Federal Transit Administration to reject the FEIS.

Several alternatives have been proposed that are more sensible and affordable. We need to start over and have a much more inclusive and transparent planning process that examines how the region can design, fund, and build a project that is lean, smart, and sustainable. Additionally, congestion tolling should be implemented now on both current Columbia crossings (I-5 and I-205) with the intention of reducing existing congestion and building up a fund for a future project that includes, among other things, construction of an arterial bridge between N Portland and Vancouver that can carry local traffic as well as MAX light rail and bike/pedestrian facilities.

Elected officials at both the State and Federal level have expressed their dissatisfaction with both the planning process and the projected cost. Lawsuits are guaranteed if the project continues to move forward. A campaign of direct action aimed at preventing construction is also likely.

Not only can we not afford the CRC, it is a terrible idea that will negatively impact the region for decades to come.

Sincerely,
Andrew Neerman
NE resident and business owner

--
http://www.blueruinpdx.com

He who binds to himself a joy
doth the winged life destroy;
but he who kisses the joy as it flies
lives in eternity's sunrise
--William Blake

P-084-001

As described in Chapter 3 (Section 3.4) of the FEIS, and in the Indirect Effects Technical Report, highway capacity improvements and access improvements can induce development in suburban and rural areas that were not previously served, or were greatly underserved, by highway access. The DEIS outlines a comprehensive analysis of the potential induced growth effects that could be expected from the CRC project. A review of national research on induced growth indicates that there are six factors that tend to be associated with highway projects that induce sprawl. These are discussed in the Indirect Effects Technical Report. Based on the CRC project team's comparison of those national research findings to CRC's travel demand modeling, Metro's 2001 land use / transportation modeling, and a review of Clark County, City of Vancouver, City of Portland and Metro land use planning and growth management regulations, the FEIS concludes that the likelihood of substantial induced sprawl from the CRC project is very low. In fact, the CRC project will likely support the region's goals of concentrating development in regional centers, reinforcing existing corridors, and promoting transit and pedestrian friendly development and development patterns. The region's goals are reinforced by the project's location in an already urbanized area, the inclusion of new tolls that manage demand, the inclusion of new light rail, and the active regulation of growth management in the region.

In October, 2008, the project convened a panel of national experts to review the travel demand model methodology and conclusions, including a land use evaluation. The panel unanimously concluded that CRC's methods and the conclusions were valid and reasonable. Specifically, the panel noted that CRC would "have a low impact to induce growth…because the project is located in a mature urban area," and that it would "contribute to a better jobs housing balance in Clark County…a positive outcome of the project". These results are summarizes in the "Columbia River Crossing Travel Demand Model Review

Report" (November 25, 2008).

In 2010, Metro ran the MetroScope model (an integrated land use and transportation model) to forecast growth associated with transportation improvements of a 12-lane river crossing and light rail to Clark College. Even with a 12-lane river crossing, the model showed only minimal changes in employment location and housing demand compared to the No-Build Alternative.

For a more detailed discussion regarding potential indirect land use changes as a result of the CRC project, including the likely land use changes associated with the introduction of light rail, please see Chapter 3 (Section 3.4) of the FEIS.

The Oregon Department of Transportation (ODOT) completed Phase I construction of the I-5 Delta Park widening project in fall 2010. Phase I of the project involved widening I-5 and lengthening the entrance and exit ramps at Victory Boulevard and Columbia Boulevard. Phase II involves improving local streets and will begin when funding is secured. Phase I of the Delta Park project widened the current 2-lane segment of southbound I-5 to 3 lanes. There are currently no immediate plans to widen I-5 south of Delta Park. Neither the CRC project nor the Delta Park projects are intended to address the southbound traffic congestion that currently exists near the I-5/I-405 split. However, traffic analyses show the congestion at the split will not be worsened because of the Columbia River Crossing project. The main reason is that fewer cars are expected to cross the river with a project in 2030 than without a project. This is due to the provision of improved transit service and tolling.

Beyond the CRC and Delta Park projects, the I-5 Transportation and Trade Partnership Final Strategic Plan recommended a comprehensive list of modal actions relating to: additional transit capacity and service; additional rail capacity; land use and land use accord; transportation

demand/system management; environmental justice; additional elements and strategies (such as new river crossings); and financing. RTC and Metro are tasked with initiating recommendations as part of their regional transportation planning role. Examples of current efforts include RTC's evaluation of future high-capacity transit in Clark County, and evaluation of needs for future river crossings. Regional planners have investigated solutions to existing bottlenecks at the I-5 connections with I-405 and I-84. ODOT is responsible for conducting ongoing studies to identify other congestion problems on I-5 in Oregon that may need to be addressed in the future.

Tolling cannot typically be implemented on an existing interstate highway unless substantial improvements are also made. Pre-construction tolling on the I-5 crossing may be possible.

An arterial bridge option between Vancouver and Portland was studied in the early CRC alternatives evaluation process, and was dropped because it did little to address the purpose and need for the project (see Chapter 2 of the FEIS).

Hines, Maurice

From: LM Patella [lmpatella@comcast.net]
Sent: Monday, October 24, 2011 7:26 PM
To: Columbia River Crossing
Subject: Problems with Columbia River Crossing
Attachments: CRC comments.docx

To Whom it may concern,

P-085-001 Attached are my comments on why the Columbian River Crossing project should not be funded.

Lawrence M. Patella
CDR USN (ret)

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

P-085-001

Thank you for taking the time to submit your comments on the I-5 CRC FEIS.

To whom it may concern,

P-085-001 I Lawrence M. Patella, Commander United States Navy Retire, Strongly object to the States of Washington and Oregon, the Columbia River Crossing, Portland's Tri-met, Clark County C-Tran, Vancouver City Council and Clark County's Board of commissioner's misleading the citizens of Clark County Washington and Portland Oregon about the need, the cost and the reason for demolishing a perfectly good Bridge for the sole purpose of bringing Light Rail across the Columbia River to Vancouver Washington.

P-085-002 Not only have these local politician been misleading the public they have been working behind the scenes and have Cancelled a promised 2011 Vote Light Rail. They have lobbied the state legislatures to create new and change existing legislation that will allow them to proceed with the expenditure of 10 billion tax payer dollar so they can to "Ram Down the Tax Payer's Throats" excessive property taxes, fees, Bridge tolls, and the sale of revenue bonds to fund a small portion of the building of a 10 billion dollar Light Rail platform across the Columbia River.

P-085-003 Acutely aware that Vancouver, Washington does not have sufficient population density to support the proposed 10 billion dollar Columbia River Crossing project, Clark County's Transit Authority has, in spite of the fact that their assets exceed their liabilities by some 114 million dollars and have a 50 million dollar are attempting to impose an outrageous tax increase to increase bus ridership in an attempt to show that there is sufficient bus ridership to support light rail. Below are two presentations that I have made to educate the voter that they are being taken to the Cleaners.

P-085-004 Why are local politicians, including most of the Vancouver City Council and two thirds of the Clark County Commissioners allowing Columbian River Crossing Planners to mislead the public.

In case you missed it, Eric Florip (Columbian Staff Writer) Article "TRAFFIC UNCERTAINTIES FAIL TO HALT CRC PROCESS" in yesterday fish wrapper says volumes about their inability to manage the project.

Are they so anxious to waste 10 billion (not the bogus 3.1 billion they would like you to believe) taxpayer dollars that they would deliberately leave out of the Final CRC Environmental Impact Statement updated traffic information that clearly shows the information they submitted is over inflated.

Now why would they do that: Let's examine their reasons for not submitting accurate information to the decision makers? But first Lets revisit the reason the local tax and spend politicians said we need this gigantic Boondoggle.

They Said: Transportation on I-5, the most important transportation artery on the entire west coast of the United States is so congested that it is adversely impacting the economic development on the entire west coast.

Here is why they don't want the decision makers to know what we taxpayers have known all along. I-5 is not congested. The purpose of the Bridge Boondoggle is to provide a platform for bringing Light Rail the Gravy/Crime Train from Portland to Vancouver.

But I digress let's get back to the CRC Planners misleading statements.

P-085-002

There will not be a public vote on construction of the various CRC project elements. However, as a public project, it must be approved and funded by the decisions of elected officials who are themselves directly elected by voters. Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on pursuing a public vote.

P-085-003

Light rail has been endorsed by every local Sponsoring Agency (Vancouver City Council, C-TRAN, RTC, Portland City Council, TriMet, and Metro), whose boards include elected officials from throughout the area.

Annual light rail passenger trips crossing the I-5 bridge in 2030 are projected to be 6.1 million, with daily ridership around 18,700. The travel time for the morning commute by light rail between downtown Vancouver and Pioneer Square in downtown Portland will be approximately 34 minutes. Light rail would travel on a dedicated right-of-way, with more reliable travel times than auto drivers dealing with unpredictable road conditions, traffic congestion, and parking challenges.

The CRC project planning for light rail incorporates and supports the principles of Vancouver's City Center Vision Plan. Downtown Vancouver has seen recent growth in higher density mixed use projects from three to 12 stories in height. In addition, another 4,000 downtown condominiums are proposed or pending as part of new developments. The core of Vancouver has, along with many of the larger corridors such as Fourth Plain Blvd, medium to high density residential development and an urban mix of uses. Transit demand in these areas is quite high, and ridership will increase with the introduction of light rail.

P-085-004

a. The CRC Traffic forecast may not be updated until 2013. Isn't that when they plan to break ground. It must be their plan to stay away from the reduced traffic numbers until the fed approve the environmental impact statement already submitted.
b. Anne Pressentin (CRC Spokeswoman): "We are looking for very much the long Horizon. Even if traffic counts don't climb as soon as originally projected, it doesn't mean that it is not going to happen". But I thought Current Congestion was a huge problem, now that the numbers are not there it is no big deal. Baloney.
c. Andy Cotugno, (Policy adviser with Portland's Metro): In response to the question how much traffic will steer clear of I-5 once polling starts, he said: "That answer will wait until 2013 – and with good reason. When CRC planners go to borrow money for the project they will need to do so with the most current data possible before tolls pay it back".

   I have no idea what the hell he is talking about. I can however tell him that one of two things will happen. Motorist will flock to I-205 or a toll will be put on I-205. Duh!

d. Nancy Boyd: She said: Leaving older, higher traffic projection in the environmental impact statement are a better reflection of the highest possible impact.

   Nancy, please don't insult our intelligence, leaving the higher, bogus, numbers in the EIS will Give your inaccurate Environmental Impact Statement a better chance of being approved.

e. And how about Cotungo saying: "If Clark County continues to struggle with double-digit un-employment, residents may end up battling Interstate 5 bridge traffic to find work".

   What a crock. And I thought as our Good Mayor, who was against bridge tolls before he was for them said once the bridge, light rail and tolls were in place new industries, business and job would be coming to Vancouver.

   And so it goes

   L. M. Patella
   CDR USN (ret)

P-085-005

Good Morning, Thank you for the opportunity to speak to this Council on what I consider C-Tran's Outrageous attempt to dig deeper and deeper into the taxpayer's pockets. For those of you who do not know me, I am Larry Patella, A retired Naval Officer, who commanded three ships during my 31 years in the United States Navy. I am a Former Manager of the Port of Portland's Navigation Division where I managed for 21 years, under contract to the Corp of Engineers the Maintenance Dredging of the Columbia River Navigation Channel. In those positions, I have over some 52 years seen enough waste of taxpayer dollars to make the most ardent spender of taxpayer dollars extremely ill. I am currently the Executive Director of the Western Dredging Association, a non-profit educational association that covers the Western Hemisphere. The goals and objectives of Western Dredging Association are to promote the exchange of information and knowledge as it relates to dredging, navigation, marine engineering and construction, as well as the enhancement of the Marine Environment. To fill my spare time I recently opened, a small business in the Carter Park Neighborhood in an attempt to do a little of my own revitalization and job creation.

Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on having a public vote.

P-085-004

Significant work has gone into developing the CRC project, including an ongoing public involvement effort. The public involvement program includes numerous advisory groups to ensure the values and interests of the community are reflected in project decisions. These groups include representatives of public agencies, businesses, civic organizations, neighborhoods and freight, commuter and environmental groups. Feedback from the general public and advisory groups has been generally supportive of the project, including support for the transit, bicycle, pedestrian, highway, interchange, and financing elements of the project. See Chapter 2 (Section 2.7) of the FEIS for more discussion on the process used to develop project alternatives and select a Locally Preferred Alternative.

By 2030, the region's population is expected to increase by one million people. This increase will result in more people needing to travel between home, work, school, recreation, etc. In 2005, 135,000 vehicles crossed the Columbia River on the Interstate Bridge, which led to 4-6 hours of congestion each weekday. By 2030, 184,000 are predicted to cross the river, which would lead to 15 hours of daily congestion if no action is taken.

Congestion occurs when vehicle demand is greater than a transportation system's capacity. It results in slower speeds and increased travel times. CRC defines congestion as vehicles traveling less than 30 mph. The Columbia River Crossing project uses information gathered from Metro's nationally-recognized travel demand models to determine the project's effect on congestion. These models predict trip frequency, types or modes of transportation, destination, and time of day. Transportation

P-085-005

That said I will get right to the point. There is no need for the empire building C-Tran to continue on almost a yearly basis to dig deeper and deeper into the people's pockets. I am certain you are thinking how or why I would or could make such a statement.

Here is how and why. Are you aware that included in C-Tran's Annual Financial Report for the year ending December 31, 2010, signed by C-Tran Officers Jeff Hamm and Diane O'Reagan, is Brian Sonnatag, Washington State Auditor's final analysis concerning the financial health of C-Tran. He stated:

"The assets of the PTBA (C-Tran) exceeded on December 31, 2010, liabilities by 114,751,751 Taxpayer Dollars. He went on to say, of this amount 49,717,245 taxpayer dollars may be used to meet C-Tran's ongoing obligations to provide service to the public, including capital programs, and to meet its other obligations.

Historically, C-Tran has only spent an average of approximately 6 or 7 million of the reserve funds in any given year. So why is C-Tran now, with Taxpayers facing the worst economic crisis since the Great 1929 Depression planning on depleting the Taxpayer's Reserve Fund? C-Tran documents tell me that by the end of 2011 only 4 million dollars will be left in the Taxpayer's Reserve Fund.

There can only be one of two answers for this unusual expenditure of taxpayer dollars. One is C-Tran and its Board of Directors are unable to run C-Tran as a business, or C-Tran and its Board of Directors are deliberately depleting the taxpayer's reserve fund so they can demonstrate to the taxpaying public they are in dire need of additional taxpayer dollars.

Ladies and Gentlemen, now is not the time, what with 12.3 % of Clark County Citizens unemployed, losing their homes, not knowing where their next dollar is coming from to impose any additional taxes. C-Tran like the people they are duty bound to serve needs to stop its empire building schemes and concentrate on their primary goals and objectives. Those Goals and Objectives are in my opinion to provide cost effective, efficient and needed bus service. Running empty busses in and around Clark County is not something anyone could or should consider cost effective, efficient or needed. It is in the opinion of many simply empire building and a waste of Taxpayer dollars.

From the information available to me, it does not appear that C-Tran Staff or its Board of Directors have any idea how much service Clark County needs? I say this because on March 9th 2011 in an email to me, Marc Boldt County Commissioner and C-Tran Board Chairman admitted many C-Tran Busses are running around Clark County Empty. In his email, a copy has been provided to you, he states "If we cannot get busses full we need to start cutting the ones that are empty". Marc also stated and I Quote "I do not want to take anyone one from their car." He also advised me that none of the revenues from yet another sales tax increase will be used for light rail.

Let's further examine these statements. When I compare information sent to me in the numerous emails exchanges with the C-Tran Board Chairman and the mountain of C-Tran documents obtained via the Washington Public Disclosure act and C-Tran's Statement For

planners use these models to analyze the effects of such factors as increased population and employment, transportation improvements, and new developments on the transportation system.

Based on the Metro model's past ability to predict transportation effects, the CRC project is confident in the data received from Metro and uses it to determine what impact the project will have on congestion. The improvements proposed by the project to the highway and seven interchanges will help better accommodate increased future vehicle traffic. New auxiliary lanes and longer on/off ramps will allow safer and more efficient merging and weaving to enter or exit the freeway. Narrow lanes and shoulders will be widened to current standards. Shoulders will be added where they are currently missing. All of these changes will improve the flow of traffic in the bottleneck area of the Interstate Bridge.

P-085-005

This comment refers primarily to C-TRAN's budget and the author's commentary on C-TRAN's use of funds. In response to the portion relevant to CRC, long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on having a public vote.

P-085-005

Proposition 1, I am at a loss to understand why C-Tran is, during this current economic Crisis that has our City, County, State and Nation millions, billions and trillions of dollars in debt, misleading the public.

Having admitted that many C-Tran busses are running around Clark County Empty why is C-Tran now using threats in their outrageous attempt to raise taxes. Why are they threatening to cut 35% of all services? Why not as Commissioner Boldt suggested, just cut the empty busses? Why not redesign the entire system so that it is more effective, and more efficient. Why not reduce or eliminate the wasteful spending of taxpayer dollars on so called capital projects. For instance, if millions and millions of taxpayer dollars have to be spent to build park and ride lots, some with elegant buildings or multi-level parking garages for the dreaded automobile, then it probably is not, with only an average of 7 bus rider per trip worth the taxpayer's money or efforts.

As for the Commissioners statement that new tax revenues will not be used for Light Rail, not true. C-TRAN Tax revenues have and continue to be used to support and promote light rail. 3 million dollars were spent 5 or six years ago on light rail planning and studies. The mere fact that the CRC project will not be built without light rail and C-Tran has and continues to support with our tax dollars, the CRC project, it is proof enough that past, current and future tax dollars Picked from the taxpayer's pockets has, is and will be used to support bringing light rail to Clark County. It appears the only purpose of Proposition 1 is to replenish what has already been spent on Light Rail.

May I be so bold as to ask all C-Tran Staff, C-Tran Board Members and those of you in this room, a simple question? A question that all who spend taxpayer dollars should ask themselves.

If the money C-Tran is picking from the taxpayer' pockets and is spending was yours, your personal funds, funds that would take food out of your children's mouths and adequate shelter away from them would you do it?

As for C-Tran Board Chairman not wanting to take people out of their cars, why then did he include in his Statement for Proposition 1 "C-Tran Serves you by taking cars off our roads and highways".

Now I ask you, do you really think running empty busses transporting approximately 2% of the commuting public around Clark County can or will ever take any cars off our roads and highways. Of course not. The Automobile is and has been one of the most important economic engines the Good Ole USA ever had. Just think for a minute about the great number of jobs that buying, owning and using an automobile has created. And please Can someone, anyone explain to me why Cars have to be taken off the road for a super expensive transit system to be successful.

I would like to leave you with two thought. They are:

P-085-005

1. Ask any high school graduate if they would rather have an automobile or lifetime bus or light rail pass as a graduation present and
2. Do you know how to Spell Automobile. If not the correct spelling is F R E E D O M.

In Closing, All need to understand that the only money that C-Tran has is what it takes from the taxpayers. C-Tran does not need to dig deeper and deeper into the taxpayer's pockets to provide a first class bus service. As Custodians of the taxpayer's hard earned dollars C-Tran has a fiduciary responsibility to properly manage the taxpayer's dollars. C-Tran's empire building needs to stop; C-Tran needs to prioritize spending. C-Tran needs to learn that nothing is free, including Tinted Window Busses bought with tax payer dollars that come out of our other pockets. C-Tran needs to understand not only do we not have a bottomless pit of money, that it cost money and lots of it just to own busses, buildings, and property. And if they, who get to spend taxpayer dollars, are having perceived difficult financial problems, just think about the problems those of us who are having our pockets picked have.

Thank You

L. M. Patella
CDR USN (ret)

Hines, Maurice

From: Jimme Peters [jimme@24-7consulting.com]
Sent: Monday, October 24, 2011 7:17 PM
To: Columbia River Crossing
Subject: Comments on refined bridge project plan

To Whom It May Concern-

P-086-001

As a volunteer that sat on the CRC Advisory Committee for three years, lives on the island, sat on the HINooN Board of Directors for two years, and has participated in the HINooN CRC presentations recently, I was shocked to see the new project plan. We all sat in the meetings, stated our concerns and were told/shown the plans based upon the needs of the island and we voted accordingly on the options to best accomplish the overall objectives.

Then, all of sudden, there are significant changes made without any discussion that are not suitable for the community. On paper, moving things around seems trivial, but when it drastically affects our neighborhood, it becomes very difficult. The removal of the light rail station and not having arterial access during construction are just the starting flaws that are problematic. This altering of the plan without any input is a major breach of trust and completely violates the concept of supposed public process. Please realign your plans with the needs of our community and uphold the commitments that were made to make this project viable for all of us.

Thank you,

Jimme' Peters
503.816.0500

P-086-001

The design has evolved based on public information and further technical analysis. These evolving designs have been brought to numerous meetings on Hayden Island and elsewhere.

The possibility of early construction of the local multimodal bridge will continue to be a consideration by the project as project sequencing is refined. It is also discussed in Chapter 2 of the FEIS, (Section 2.3.1), but not as mitigation. Although it is not appropriate to describe the early construction as mitigation, it is discussed as something we will explore as we further refine construction staging. Specifically Section 2.3.1 of the FEIS states:

> Similarly, the Marine Drive interchange construction would need to be coordinated with construction of the southbound lanes coming from Vancouver. While this interchange can be constructed independently from the work described above, the completion and utilization of the ramp system between Hayden Island and Marine Drive requires the work to occur in the same period. Early construction of the local multimodal bridge between Marine Drive and Hayden Island, so that it can be used as an alternate access route during the remaining construction period, will be analyzed during final design. The interchange reconstruction also needs to occur so that Marine Drive can be elevated, allowing the light rail extension to cross under Marine Drive. The Marine Drive interchange is expected to take a little more than 3 years to construct, including work at the Victory Boulevard interchange.

Hines, Maurice

From: Debbie Peterson [debbie@debbiepeterson.org]
Sent: Monday, October 24, 2011 11:39 PM
To: Columbia River Crossing
Subject: FEIS Concerns

P-087-001

1. Why wasn't a supplemental Environmental Impact Statement written, when the Box web design was eliminated and a new design was put in place?

P-087-001

A supplemental DEIS was not required because the impacts of the composite deck truss fit within the parameters of impacts evaluated in the DEIS. The DEIS did not evaluate a single bridge type. It evaluated an envelope of impacts defined by vertical and horizontal parameters and general pier arrangements.

Hines, Maurice

From: Debbie Peterson [debbie@debbiepeterson.org]
Sent: Monday, October 24, 2011 11:39 PM
To: Columbia River Crossing
Subject: FEIS Concerns

P-087-002 | 2. Why weren't updated finance models used?

P-087-002

Please refer to Chapter 4 of the FEIS for a description of the current plans for funding construction and operation of the LPA. This discussion provides an updated assessment of likely funding sources for this project, though it is not common practice to receive funding commitments prior to completion of the alternative selection process.

At Governor Kitzhaber's request, the Oregon State Treasurer conducted an independent review of the CRC's financing plan and released a report in July 2011. CRC incorporated the treasurer's recommendation in Chapter 4 of the Final EIS.

Hines, Maurice

From: Debbie Peterson [debbie@debbiepeterson.org]
Sent: Monday, October 24, 2011 11:41 PM
To: Columbia River Crossing
Subject: FEIS Concerns

P-087-003

3. Why weren't traffic models that reflect actual decrease use on I-5 used?

P-087-003

Traffic volumes fluctuate and did decrease during some years. Traffic volumes obtained from the Oregon Department of Transportation's automatic traffic recorder (ATR) monitoring sites show that traffic volumes have, in fact, been increasing in the last few years. Whether the traffic volumes forecast for year 2030 will actually be achieved in that year should not be the only consideration. In its July 27, 2010 report, the Independent Review Panel expressed concerns about a longer horizon. The IRP commented "The desirability of living in the Portland/Vancouver region is not going to diminish, so populations will continue to grow…. [T]he IRP believes the greatest risk in the decision-making process is not over-sizing the bridges but not building enough capacity for the next 100 years." [1]

[1] Warne, Thomas (2010). I-5 Columbia River Crossing Project, Independent Review Panel, Final Report. Independent Review Panel, Olympia, July 27, 2010.

Hines, Maurice

From: Debbie Peterson [debbie@debbiepeterson.org]
Sent: Monday, October 24, 2011 11:41 PM
To: Columbia River Crossing
Subject: FEIS Concerns

P-087-004

4. Why weren't traffic models used that reflected a decrease in I-5 useage as tolls went up, over the course of the years?

P-087-004

By 2030, the region's population is expected to increase by one million people. This increase will result in more people needing to travel between home, work, school, recreation, etc. In 2005, 135,000 vehicles crossed the Columbia River on the Interstate Bridge, which led to 4-6 hours of congestion each weekday. By 2030, 184,000 are predicted to cross the river, which would lead to 15 hours of daily congestion if no action is taken.

The Columbia River Crossing project uses information gathered from Metro's nationally-recognized travel demand models to determine the project's effect on congestion. These models predict trip frequency, types or modes of transportation, destination, and time of day. Transportation planners use these models to analyze the effects of such factors as increased population and employment, transportation improvements, and new developments on the transportation system.

The traffic forecast for the project was developed for the year 2030. The analysis does not provide estimates of throughput and demand for different periods throughout the presumed 100 year life span of the bridge. Not only is it required, locally and federally, to focus on the twenty year planning horizon, it is also the longest period for which modeling has been deemed reliable. Changes in socioeconomics, and transportation technology may change significantly over the next 50 years, making scientifically reliable estimates throughout that period very suspect and speculative.

However, the tolling and project funding analysis has looked at a longer period of time. At Governor Kitzhaber's request, the Oregon State Treasurer conducted an independent review of the CRC's financing plan and released a report in July 2011. CRC incorporated the treasurer's recommendation in Chapter 4 of the Final EIS. Following the Record of Decision, the project will complete an investment-grade tolling analysis

Hines, Maurice

From: Debbie Peterson [debbie@debbiepeterson.org]
Sent: Monday, October 24, 2011 11:42 PM
To: Columbia River Crossing
Subject: CRC FEIS Concerns

P-087-005

5. Why weren't episodic events and the pollution impact studied for the FEIS?

which will provide more specificity about the long term tolling revenue projections. The analysis of tolling did not assume that the tolls would increase in "real value" over time. As inflation has been estimated to rise at approximately 2.5% per year, the same annual increase was used as an assumption regarding the toll amount.

Details of the tolling system are still being refined as the project development enters the final design stage. The ultimate decision on any tolling options will be made by both the Washington and Oregon Transportation Commissions.

P-087-005

In air quality analysis, "episodic events" typically refer to those specific times that pollutant standards are exceeded. For some pollutants, weather conditions are associated with accumulation of emissions that then result in the exceedances. Weather conditions are included in the air quality modeling analysis conducted for the CRC EIS.

There have been no exceedances of standards in this region for many years, and forecasts estimate that pollutant levels will continue to decrease.

Hines, Maurice

From: Debbie Peterson [debbie@debbiepeterson.org]
Sent: Monday, October 24, 2011 11:42 PM
To: Columbia River Crossing
Subject: CRC FEIS Concerns

P-087-006

6. What happens if I-1125 passes? Will you do an SEIS (Supplemental Environmental Impact Statement) for that financial scenario

P-087-006

A change in financing would be unlikely to require a supplemental DEIS. However, any change that occurs to the project will be reviewed to determine if it would change impacts. Those changes that would make a meaningful difference in impacts will be reviewed to determine if any supplemental analysis and documentation are required.

Hines, Maurice

From: Debbie Peterson [debbie@debbiepeterson.org]
Sent: Monday, October 24, 2011 11:44 PM
To: Columbia River Crossing
Subject: CRC FEIS Concerns

P-087-007

9. Why as there been no economic forecast of the cost to business that will be remaining throughout construction?

P-087-007

The project has not attempted to quantify the potential profit/loss effect of construction on adjacent businesses, but the project has considered, and the FEIS recognizes, that temporary traffic changes, noise, and other construction activities will affect these businesses. The FEIS also identifies mitigation for reducing those impacts (Sections 3.4.4 and 3.4.5). The project also commits to coordinate and communicate with business owners to help further define this mitigation.

Hines, Maurice

From: Debbie Peterson [debbie@debbiepeterson.org]
Sent: Monday, October 24, 2011 11:45 PM
To: Columbia River Crossing
Subject: CRC FEIS Concerns

P-087-008

8. What happens when The City initiative is presented on the ballot - with no City monies or employee support of the LPA is allowed?

P-087-008

The result of any initiatives approved by voters that affect the project would need to be addressed. We can not say in advance how initiatives that are not yet on the ballot would affect the project.

Hines, Maurice

From: Debbie Peterson [debbie@debbiepeterson.org]
Sent: Monday, October 24, 2011 11:49 PM
To: Columbia River Crossing
Subject: CRC FEIS Concerns

P-087-009 10. Why is there no contingency money set aside for those businesses that will be hurt by the construction over seven years?

P-087-009

Direct payments to such businesses are not proposed, but the project has committed to funding measures to help reduce impacts to these businesses (see Section 3.4.5 in the FEIS).

Hines, Maurice

From: Debbie Peterson [debbie@debbiepeterson.org]
Sent: Monday, October 24, 2011 11:59 PM
To: Columbia River Crossing
Subject: CRC FEis Concerns

P-087-010

subsequesnt Changes and Analysis -- When was the information you hae shown compiled and prepared? What is the current "locally Preferred Alternative?
How much of teh analysis and data that you have been shown was created or compiled after April 2008? Tom Buchele goes on to say to the IRP. "I have no doubt that the vast majority of what the CRC has shown you fits that description and therefore was not and could not have been included in the DEIS. Why did CRC issue a DEIS before compiling this information and before conducting this analysis? The CRC in fact intends to dump all of most of this new analysis anbd information into an FEIS - which is too late for meaningful public participation under NEPA.

My question is. WHy did CRC do that as indicated in the last sentence?

1

P-087-010

A description of the locally preferred alternative is in Chapter 2 of the FEIS. The LPA is also described in the Record of Decision, and referred to as the Selected Alternative.

The information in the FEIS, that was not in the DEIS, reflects comments received on the DEIS, updated analysis, refined design information, and other information and input received after the issuance of the DEIS. This is the usual process when moving from a DEIS to an FEIS. At the beginning of each section of Chapter 3 in the FEIS is a summary of what information in that section is new since the DEIS. Much of this new information was provided to the public during the outreach that occurred between the DEIS and the FEIS. Please see the responses to O-002 for more information regarding the questions about comments by Tom Buchele and information and analysis completed after the DEIS.

Hines, Maurice

From: Daniel M. Potter [danielmpotter77@gmail.com]
Sent: Friday, October 21, 2011 3:59 PM
To: Columbia River Crossing
Subject: CRC

P-088-001

Build the bridge ASAP with NO tolls and NO light rail! If mass transit must be included, use rapid BUS transit as it is less expensive, safer, and can be changed/moved.

Thank you,

Daniel M. Potter
North Portland

Daniel - danielmpotter77@gmail.com

1

P-088-001

The selected alternative includes both light rail and tolls. The rationale for this is discussed in Chapters 1, 2 and 4 of the FEIS. You are correct that bus rapid transit routes can be more easily moved than light rail transit routes, but even they involve relatively substantial capital construction and run in a separate guideway. See the EIS discussion of costs, and safety comparisons of LRT and bus rapid transit.

Hines, Maurice

From: Brian Riley [bgrmosaic@gmail.com]
Sent: Monday, October 24, 2011 11:36 PM
To: Columbia River Crossing
Subject: Just please consider...

P-089-001 The issue is car traffic and how to alleviate it.

My concern is the easier you make the Columbia River Crossing for car traffic, the more car traffic you invite to use it, (I just don't want to see the region back with the same issue of car traffic 20 years down the line).

P-089-002 Regarding the light rail extension, There is another way to extend the light rail to Vancouver, alleviate a lot of commuter traffic on the I-5 and increase the service on AmTrak between Vancouver, WA and Portland, OR.

If possible, would love to discuss that solution further, Thank You.

P-089-001

The proposed new add/drop lanes (i.e., lanes that connect two or more interchanges) are used to alleviate safety issues associated with the closely spaced interchanges in the project area and are not designed to increase capacity generally on I-5. 68% to 75% of I-5 traffic within the project area enters and/or exits I-5 within the CRC project area, and these add/drop lanes provide space for this traffic to do so without disrupting cars and trucks traveling to destinations further north and south of the project area. The project does not propose to add lanes north or south of the project limits.

The DEIS evaluation found that the project, with a toll and light rail, would actually reduce the total daily volume of traffic using the I-5 and I-205 river crossings by approximately 3%. The FEIS analysis of the project has been updated to include an evaluation of how the CRC project would affect Vehicle Miles Traveled (VMT) (see Chapter 3, Section 3.1). Rather than inducing sprawl, the CRC project will likely reinforce the region's goals of concentrating development in regional centers, reinforcing existing corridors, and promoting transit and pedestrian-friendly development and development patterns. In 2010, Metro ran the MetroScope model (an integrated land use and transportation model) to forecast growth associated with transportation improvements of a 12-lane river crossing and light rail to Clark College. The model showed only minimal changes in employment location and housing demand compared to the No-Build. For more information see FEIS Chapter 3, Section 3.4.

P-089-002

Specific suggestions are welcomed through the feedback email listed on the project website at http://www.columbiarivercrossing.org/ContactUs.asp or can be discussed by calling the project office. The Record of Decision recongizes the LPA's light rail alignment as the

Selected Alternative for construction. Creative ideas about the design and operation of the system are still welcome.

Hines, Maurice

From: Mark Robinowitz [mark@oilempire.us]
Sent: Monday, October 24, 2011 10:26 PM
To: Columbia River Crossing
Subject: Final EIS comment and request for Supplemental Draft EIS
Attachments: crc-sdeis-request.pdf

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www.road-scholar.org
Peak Traffic: Transportation Triage at the End of the Age of Oil

www.sustaineugene.org
Green Eugene or Greenwash?
Big Steps to Sincere Sustainability

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

Columbia River Crossing
Final Environmental Impact Statement
Request for Supplemental Draft EIS

Mark Robinowitz - www.Road-Scholar.org
"Peak Traffic: Transportation Triage at the End of the Age of Oil
Box 51222 - Eugene, OR 97405 - mark@permatopia.com

Comments submitted October 24, 2011

P-090-001 A Supplemental Draft EIS is needed to redo the asssumptions that Vehicle Miles Traveled will continue to increase even as energy supplies decline.

While it is nice that the Final EIS admits that Peak Oil is a concern, the discussion is so erroneous that a SDEIS is needed to revise the basic assumptions of the project.

P-090-002 The Final EIS does not mention that traffic levels in Oregon have peaked, nor is there any substantial discussion of the decline of the energy supplies that run traffic levels in the study area.

P-090-003 The Final EIS admits that Alaskan oil peaked in 1988 but it does not mention that flow rates have declined two-thirds since that peak and are approaching a "low flow" condition where flows may not be able to be maintained in the Arctic winter. When the Alaska Pipeline no longer flows in the winter, what part of the world will give up some of their energy usage so that Cascadia can maintain petroleum consumption?

The Alyeska Pipeline "Low Flow" study should be reviewed for the implication for traffic patterns in the Pacific Northwest, both the study area for this project and the region as a whole. A cut off of petroleum supplies from Alaska would have major implications for the economy and travel demand. Currently, the Alaska Pipeline has about 600 thousand barrels per day. When the flow declines to 500 thousand per day it may no longer be possible to sustain oil flows. The Alyeska Pipeline company is trying to determine if the Pipeline can be continued to lower flows than this, but even if this is technically possible it is reasonable to assume that the Alaska Pipeline will be over as an energy source before the 20 year planning horizon for the Columbia River Crossing.

P-090-001

Mr. Robinowitz states that a Supplemental DEIS is needed to sufficiently address peak oil. The DEIS and FEIS discuss peak oil in Section 3.19, Cumulative Effects, and consider impacts of peak oil on the project and the project on peak oil. A supplemental draft is required if there is new information or changes to alternatives resulting in new significant impacts not previously discussed in the draft. Little has changed regarding peak oil since the publication of the DEIS. FTA and FHWA believe that the treatment of the issue is legally sufficient and does not require a Supplemental DEIS.

As discussed in the DEIS and FEIS, significant increases in oil prices can have both short term and long term effects on travel behavior. In the short term, the options for responding to rising gas prices are more limited, and include making no changes in behavior other than paying more for fuel, driving less and/or changing from driving to walking, biking or transit for at least some trips. During recent increases in gasoline prices, transit use increased and off-peak highway travel decreased. Peak period highway travel changed little.

Over the long term, there are more options for adjusting to changes in gasoline prices, besides changing driving behavior. Technological advances and legislative mandates can increase fuel efficiency standards in the long term. In turn, as older vehicles wear out, more consumers can replace them with more fuel efficient vehicles. Automobile manufacturers are developing and will continue to develop new vehicle and engine technologies that require much less, or even no, petroleum-based fuels. This trend is already happening as evidenced by the growing popularity of gasoline-electric hybrid and electric vehicles.

Mr. Robinowitz's comment states that national and regional vehicle miles traveled (VMT) are on the decline and will continue to decline, therefore "peak traffic" has been reached. Traffic counts showed a short term

P-090-004 My comments on the Draft EIS were not addressed in the Final EIS, and they are resubmitted for the record of the Final EIS along with background information on Peak Oil and Peak Traffic.

www.sustaineugene.org/columbia-river-crossing.html
CRC Peak Traffic Alternative, comments submitted for the Draft EIS, 2008

www.road-scholar.org/peak-traffic.html
why Peak Oil and Peak Traffic require an end to highway expansion, we will have a hard enough time maintaining what has already been built on the energy downslope

P-090-005 The Final EIS claims estimates of Peak Oil range from 1990 to 2040. No one seriously proposes either end of this range.

The earliest predictions of global Peak Oil were made by geologist M. King Hubbert, who originally estimated that it would occur in the mid 1990s. He qualified this prediction noting that it could be delayed about a decade if there were conservation efforts that reduced consumption, which is exactly what happened (in large part due to the price shock of the 1973 Arab oil embargo).

Former University of Oregon petroleum geologist Walter Youngquist estimated in the 1990s that the global peak would happen around 2007. He looked at petroleum figures from 42 countries to make his prediction (abstract attached to these comments). This is about as close as anyone got. Focusing on the exact peak is not important, as long as the correct decade is considered. Any energy plan that assumes a half century range of timing for the peak is useless and wrong.

The most pollyanna predictions by geologists for global Peak are still well before 2040.

P-090-006 During the time period of the CRC study global oil production peaked and is now on a bumpy plateau. NEPA states that "new circumstances" relevant to a study need to be examined in a Supplemental Draft EIS. If reaching Peak Oil and Peak Traffic is not a new circumstance then nothing is.

decline in many kinds of trips, but that has reversed and volumes are again growing. Transportation modeling utilized by the CRC project forecasts that VMT in the project area will continue to rise as the population in the Portland-Vancouver metro area continues to increase. Please see the responses to comments in letter P-047 regarding traffic counts and forecasts.

P-090-002
Please see response to P-090-001.

P-090-003
Please see response to P-090-001.

P-090-004
Please see the response to comment P-090-001 above. The FEIS may not reflect Mr. Robinowitz's recommendations but comments were responded to. Responses to comments received during the DEIS review period were published on the CD included with the FEIS or FEIS summary and on the project's website.

P-090-005
Please see response to P-090-001.

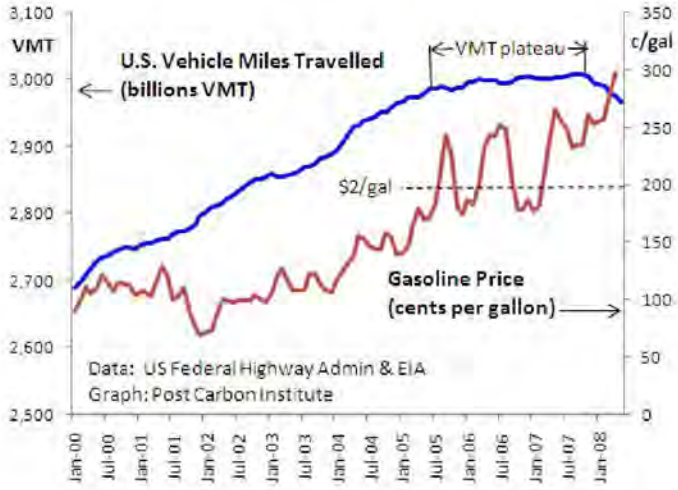
P-090-006
Peak oil was considered in the DEIS and is not a new issue that has arisen since the DEIS was published. Please see the response to comment P-090-001 above.

P-090-007 Peak Oil for "all liquids" was 2008 and given decline of the largest fields it's unlikely that offshore drilling, tar sands and other extreme measures will make up the difference. The new "Bakken" oil field in North Dakota is difficult to extract and lacks the "energy density" or "net energy" of previous petroleum supplies. We are scraping the bottom of the barrel to go after the lower grade, more expensive supplies, but they are unlikely to offset the depletion of the supergiant fields such as Prudhoe Bay (Alaska), Cantarell (Mexico), Ghawar (Saudi Arabia), etc.

Peak Oil is not just about gasoline prices rising or the illusion of a hundred million electric cars. Energy depletion means the energy will not be there to use. You cannot burn fuel that does not exist. Endless growth was not possible on a round, finite planet. Brace for impact.

P-090-008 Traffic levels have also peaked as oil prices increased and economic "growth" slowed. It is not a surprise that rising oil prices stopped the rate of traffic growth.

P-090-009 There is still a lot of traffic but the levels are not going up any more. A Supplemental Draft EIS is needed to examine how Peak Traffic will impact the alleged need for expanded highway capacity.



P-090-007

Please see response to P-090-001.

P-090-008

Please see response to P-090-001.

P-090-009

Peak oil was considered in the DEIS and is not a new issue that has arisen since the DEIS was published. Please see the response to comment P-090-001 above. Also see the responses to P-047, Mr. Joe Cortright's letter regarding fluctuations in traffic volume growth, decline, and forecasts.

Columbia River Crossing
Final Environmental Impact Statement
September 2011
Federal Highway Administration, Oregon and Washington DOT
p. 3-321

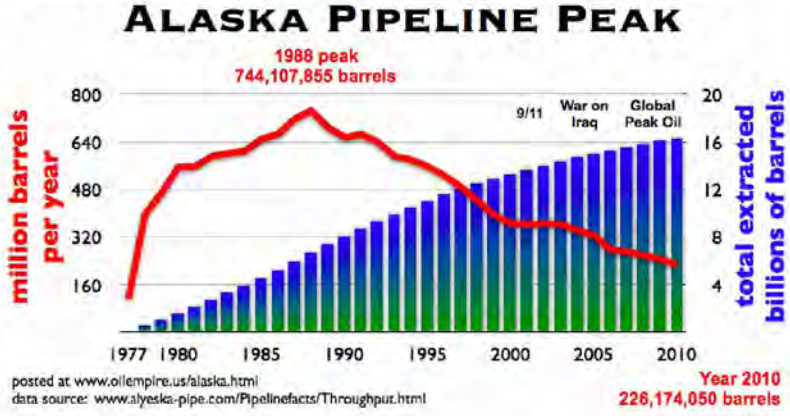
P-090-010

Washington and Oregon Petroleum Supply

"Because gasoline and diesel are the primary energy sources for the transportation sector, this analysis of energy supply focuses on petroleum-based fuel sources. **Approximately 90 percent of Washington's current supply of crude oil comes from Alaska's North Slope oil fields.** Five refineries in the Puget Sound area distribute refined petroleum products to Washington and adjacent states. **Oregon imports 100 percent of its petroleum, approximately 90 percent of it from Washington refineries. Both states' future supply of petroleum is largely dependent on domestic production and reserves. Oil production from the North Slope peaked in 1988 and is projected to continue declining.**"

This ignores the fact that North Slope extraction has dropped by two-thirds and is nearing the "Low Flow" condition where flow will be difficult to maintain in the Arctic winter even though this information is on the Alyeska Pipeline website.

for more information: www.alyeska-pipe.com/Inthenews/LowFlow/LowFlow.html



Request for Supplemental Draft EIS - Peak Oil and Peak Traffic - page 4

P-090-010

Please see response to P-090-001.

P-090-011

Please see response to P-090-001.

P-090-011

EXISTING CONDITIONS AND ENVIRONMENTAL CONSEQUENCES • 3-447
3.19.12 Energy and Peak Oil

The long-term energy demand estimates prepared for the CRC project are influenced by cumulative factors. Those estimates are based on travel demand forecasts that factor in projected regional changes in land use patterns, employment, population growth, and other programmed transportation improvements.

The cumulative energy impact of primary concern is "peak oil." Peak oil refers to the point in time at which the maximum global petroleum production rate is reached, after which the rate of production enters a terminal decline. Peak oil results from many incremental actions, few of which are individually important. However, the potential impact of reaching peak global petroleum production is an important consideration for projects, such as CRC, that are intended to address transportation needs for decades to come.

Oil production in the United States—the world's third largest oil producing nation—reached its peak around 1970 and has been declining since then. **Most estimates place peak global production sometime between 1990 and 2040.**

When oil production drops below oil demand, it is likely to cause petroleum prices to increase. There are uncertainties, however, regarding peak oil's timing and the availability of substitute fuels. Peak oil's effect on transportation fuel prices and travel behavior will depend largely on when peak oil occurs and the availability of substitute fuels.

Peak oil's potential effects on economic activity and travel behavior could affect travel behavior in the region. **The concern is that if substitute fuels are not readily available as petroleum supplies decrease, the rising cost and reduced supply of petroleum could directly reduce auto and truck travel, and could result in dramatic reductions in economic activity, which, among other effects, could further reduce vehicle trips below forecasts.** These vehicle trip forecasts influence the proposed size, design, and financing of transportation facilities.

If fuel prices increase faster than expected, then the number of 2030 highway trips could be lower than forecasted. However, even with relatively substantial fuel price increases, the future demand would still likely be greater than the expanded highway capacity. Because fuel costs represent only a portion of total transportation costs (which include everything from car payments, to insurance and maintenance), even large growth in fuel costs translates to a smaller growth rate in total transportation cost, which more directly affects travel demand in the long term.

Request for Supplemental Draft EIS - Peak Oil and Peak Traffic - page 5

P-090-011 Comment: sharper increases in fuel costs combined with decreased availability of fuel will also have substantial economic impacts that will reduce travel demand. An early version of this shift was demonstrated as oil prices increased as global production peaked. Unemployed people do not drive as much as those who have job security.

P-090-012 Global demand for liquid fuels is projected to grow by 21 percent by 2030, driven in large part by transportation needs (EIA 2010). Petroleum accounts for the largest percentage of liquid fuels globally. Local transportation energy demand is expected to grow as well, although the LPA is projected to reduce future transportation petroleum demand compared to the No-Build Alternative. At the global scale, these fuel savings will be very small, but incrementally more beneficial than the No-Build Alternative.

The LPA includes a number of elements that would reduce adverse impacts related to peak oil. These include:

- The bridge and highway improvements are focused on replacing or updating aging infrastructure, not on building new highway corridors.
- The LPA includes substantial improvements to public transportation, with projected increases in transit mode share in the afternoon peak direction from 8 percent with the No-Build Alternative to 15 percent with light rail transit.
- It provides substantially improved facilities for non-motorized transport (such as walking and bicycling).
- It supports land use planning that seeks to control sprawl, concentrate development, and decrease auto dependency.
- It includes road use pricing (highway tolling).
- Because of the addition of high-capacity transit and the bridge toll, the LPA is projected to have lower daily I-5 river crossings than under the No-Build Alternative.
- It improves highway operations at a key pinch point, which improves fuel efficiency and lowers emissions.
- It increases highway safety, which decreases collisions and congestion, further improving fuel efficiency.

Another concern is the ability of existing transportation infrastructure to adapt to post-peak oil vehicles and technology. Based on current and prototype future alternative fuel vehicles, it is highly likely that the CRC infrastructure (transit guideway, bridges, highway, and bike and pedestrian paths) will be able to accommodate foreseeable changes in vehicle technology and fuels. Electric hybrids, electric plug-ins, and vehicles powered by biodiesel, ethanol, or hydrogen fuel cells

P-090-012

Please see response to P-090-001.

P-090-012

are being designed to operate on modern roads and highways. The light rail transit guideway can be used by vehicles powered by a variety of fuels. The capacity of the proposed bicycle and pedestrian facilities can accommodate substantial growth in non-motorized transportation demand. It is likely that the proposed CRC infrastructure could readily accommodate or adapt to the transition to substitute fuel vehicles, higher than projected growth in non-motorized modes, and higher growth in transit demand.

There is substantial uncertainty regarding the timing of peak oil, the future availability of substitute fuels and technology, and the effects of peak oil on transportation. It is reasonable, however, to conclude that the CRC project can address reasonably foreseeable impacts associated with peak oil, and reduce the project's incremental adverse impact.

Outside the purview of CRC, numerous other measures will influence the timing and impact of peak oil at the global and local scale. These other actions include national and international energy policies, global oil prices, fuel and transportation taxes and fees, alternative fuel and technology research and development, agricultural policy and practices, local land use regulations, and other measures.

Comment: This section needs to be rewritten to acknowledge that oil has already peaked and the economic impacts of reaching the limits to endless growth on a finite planet. Energy creates money, not the other way around. Peak does not mean that we have run out, but it does mean that growth is over. Energy decline is not just about rising oil prices, it is about a reduction in the available supply. The level of demand that the public has for liquid fuels cannot make those fuels come into existence. There are physical limits to energy supplies that are not subject to economics or psychology. Yes, higher prices spur energy companies to extract lower quality, more expensive, more difficult to extract supplies -- and to look at alternatives to fossil fuels. But these mitigation approaches on the downslope are unlikely to offset the decline in the energy supplies that keep our transportation levels constantly increasing.

P-090-013

What does the U.S. Department of Energy say about peak oil?

A report by the U.S. Department of Energy (Hirsch et al. 2005) included the following conclusions:

- World oil peaking is going to happen, and will likely be abrupt.
- The problem is the demand for liquid fuels (growth in demand mainly from the transportation sector).

P-090-013

Please see response to P-090-001.

P-090-013

- Mitigation efforts will require substantial time.
- Both supply and demand will require attention.
- More information is needed to more precisely determine the peak time frame.

Comment: The Hirsch report concluded twenty years of preparation would be needed to prevent the economic crash from Peak Oil, even if toxic practices such as coal to liquids, tar sands and other noxious sources were extracted. Hirsch concluded that we would have a severe economic shock if we waited until the Peak to start making shifts. Ignoring this conclusion of the report invalidates the EIS and requires a Supplemental Draft EIS to examine the probable scenarios regarding travel demand and economic stability in the CRC's design year.

P-090-014

Has transportation infrastructure been able to adapt to change?
Transportation infrastructure has proven to be relatively adaptable. For example, the northbound I-5 bridge over the Columbia River was built in 1917 as a two- lane bridge that originally carried electric trolley cars and Model T autos (which ran on either gasoline or ethanol). While the bridge is now out-of-date in terms of seismic safety and traffic safety design standards, the bridge has accommodated nearly a century of changes in transportation technology, energy policy and prices, vehicle types, and travel behavior.

Comment: There never before has been a permanent plateau on energy availability. Reaching the limits to growth in energy needs to be examined in a Supplemental Draft EIS. Solar energy and biofuels are great but they are unlikely to be able to completely replace our current consumption.

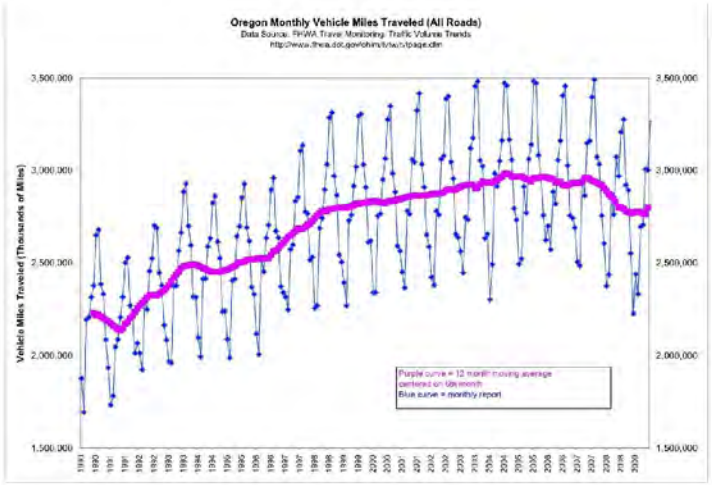
"The government cannot print oil."
-- Robert Hirsch, ASPO USA 2009 conference, October 13, 2009

"The economists all think that if you show up at the cashier's cage with enough currency, God will put more oil in the ground."
-- Kenneth Deffeyes, petroleum geologist and associate of M. King Hubbert

P-090-014

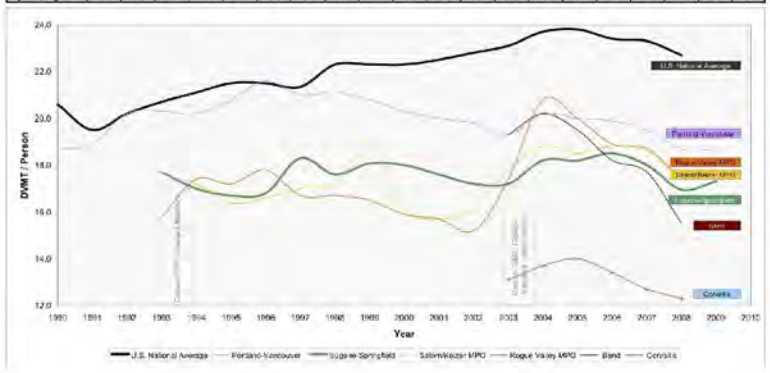
Please see the responses to Mr. Robinowitz's above comments, and the discussion of peak oil and energy in Section 3.19, Cumulative Impacts, of the FEIS.

P-090-015



Daily VMT (Vehicle Miles of Travel) Per Person - 1990 to 2008
Eugene-Springfield compared with other Oregon MPOS and the US National Average

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
United States	20.8	19.8	19.7	20.2	21.1	21.5	21.6	21.8	22.3	22.1	22.5	22.5	22.4	23.1	23.7	23.8	23.8	23.5	22.7	
Portland-Vancouver	18.2	n/a	18.2	20.1	20.7	20.5	21.6	21.0	21.1	20.7	21.3	20.8	19.8	19.1	20.2	20.6	19.5	19.5	18.7	18.1
Eugene-Springfield	n/a	n/a	n/a	17.7	17.6	18.7	18.8	18.3	17.6	20.1	19.9	17.8	17.2	17.2	18.2	18.2	18.5	19.0	16.9	17.3



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Please see response to P-090-001.

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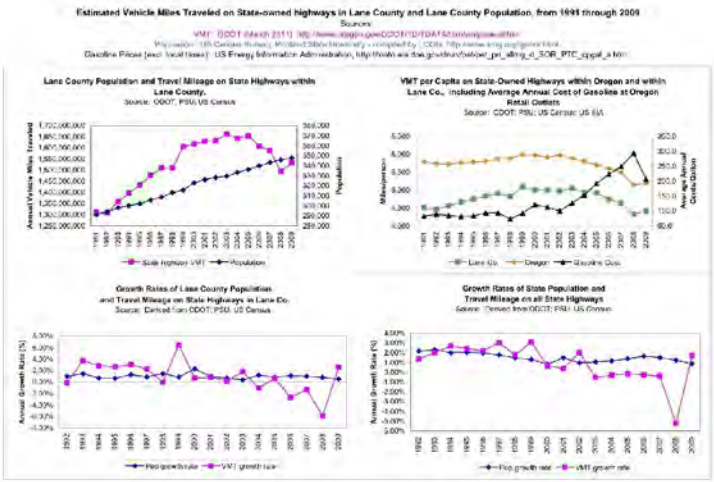
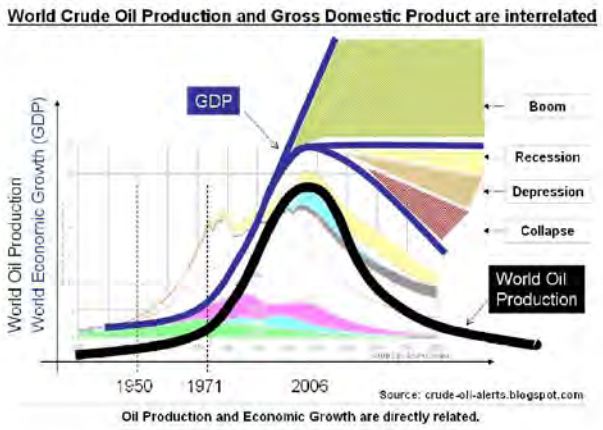


graphics from the Lane Council of Government



Oil Production and Economic Growth are directly related.

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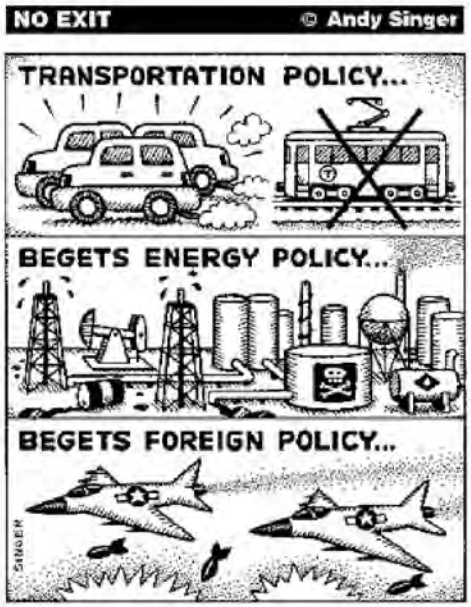
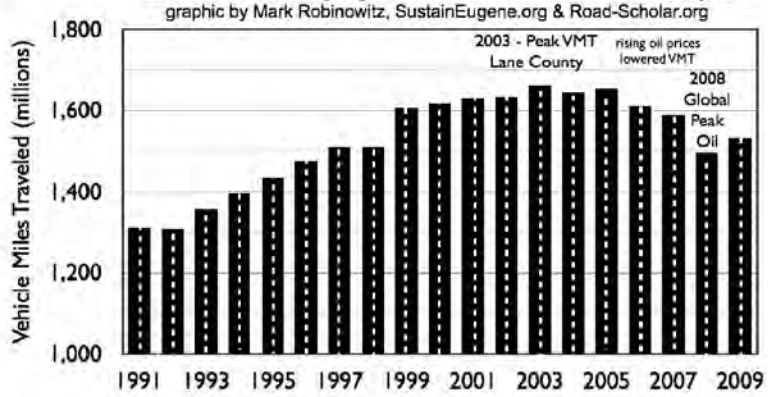


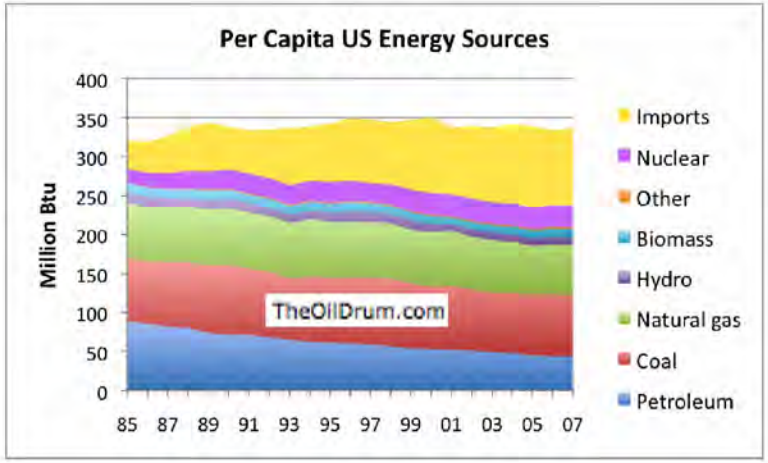
Lane County VMT - Oregon State Highways

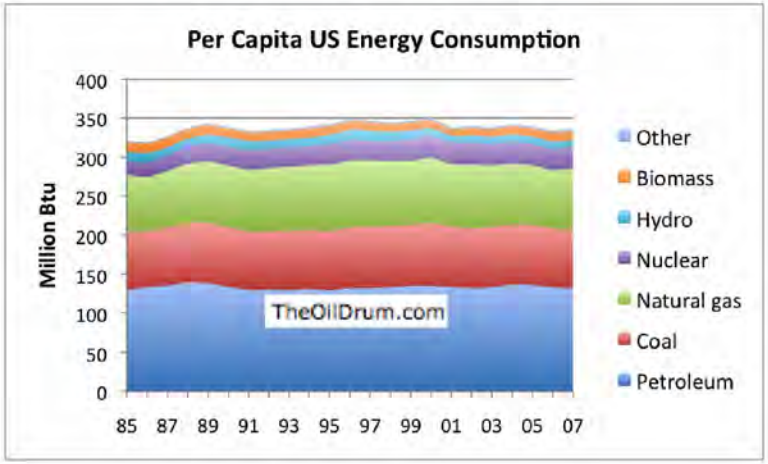
data source: www.oregon.gov/ODOT/TD/TDATA/tsm/docs/VMTCounty.xls
graphic by Mark Robinowitz, SustainEugene.org & Road-Scholar.org



Request for Supplemental Draft EIS - Peak Oil and Peak Traffic - page 11

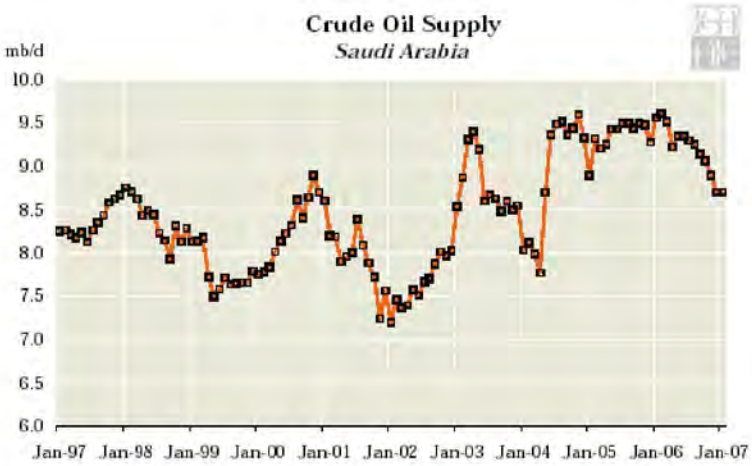
P-090-015

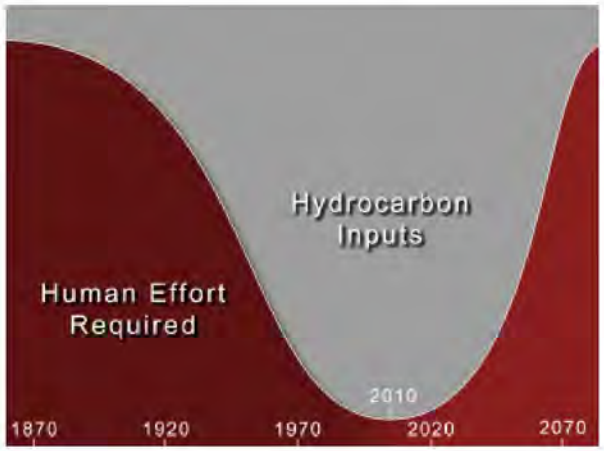




Request for Supplemental Draft EIS - Peak Oil and Peak Traffic - page 12

P-090-015



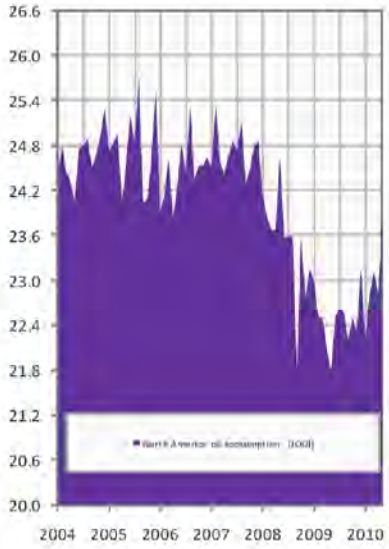


Request for Supplemental Draft EIS - Peak Oil and Peak Traffic - page 13

P-090-015

North America oil consumption
Oil consumption in North America increased by 1.0 million b/d from April to May 2010. Resulting in a consumption level of 23.84 million b/d. Average oil consumption in North America in 2009 was 22.51 million b/d, versus 23.50 and 24.72 million b/d in respectively 2008 and 2007.

Chart 21: North America Oil Consumption Jan. 2004 - May 2010



Source: Joint Oil Data Initiative

graphic showing North American oil consumption dropping after global Peak Oil -- we cannot burn fuel that does not exist whether it is cheap, expensive or rationed -- from www.peakoil.nl

P-090-015

graphics from Energy Watch Group, Germany
US production is long past peak and the future of US oil is low grade shale, offshore drilling and Canadian tar sands.

Figure 29: Oil production in the USA

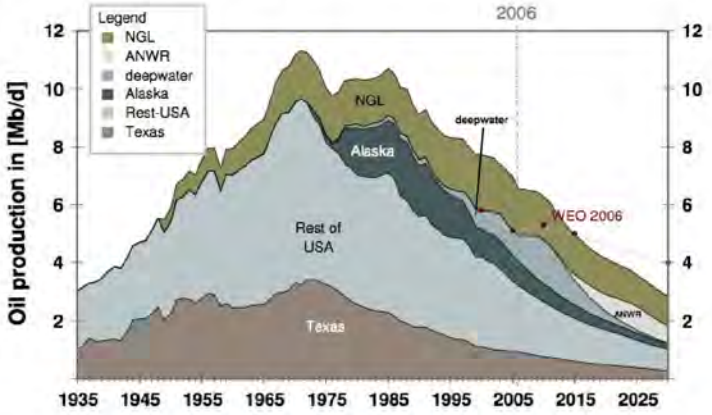
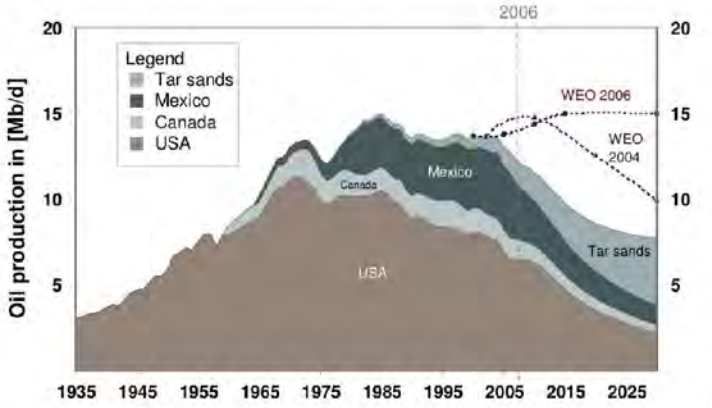


Figure 28: Oil production in OECD North America



Request for Supplemental Draft EIS - Peak Oil and Peak Traffic - page 15

P-090-015

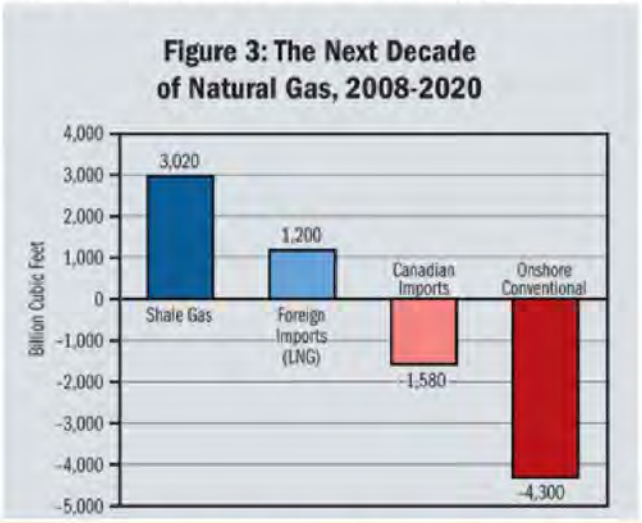
graphic from British Petroleum

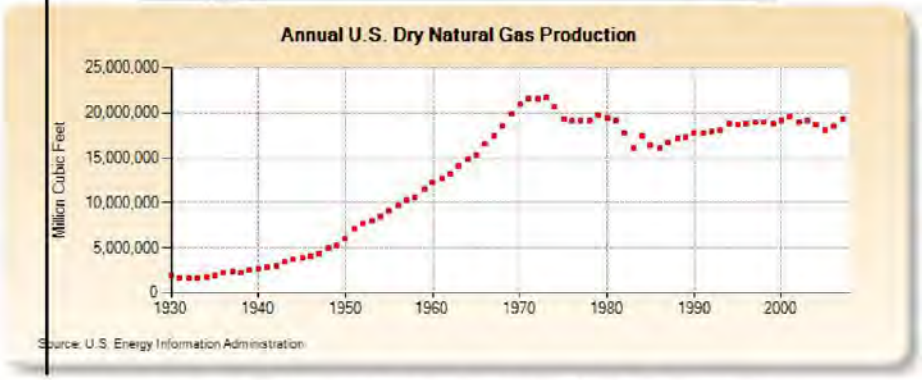


Note that Cascadia does not have ANY oil, we have the wrong geology.
Volcanic basalt and subduction zones are not where petroleum traps are created.
There is a small amount of natural gas in Oregon.

P-090-015

graphic from US Department of Energy
the decline of Natural Gas will have significant impact on economics, including electricity production (since there has been a lot of new power generation in the past two decades running on natural gas). Shale gas "fracking" is a short term resource that is unlikely to last as long as its promoters claim.
for details read geologist Art Berman's reports at www.aspousa.org and reports on natural gas at Post Carbon Institute www.postcarbon.org





Request for Supplemental Draft EIS - Peak Oil and Peak Traffic - page 17

P-090-015

from the Association for the Study of Peak Oil and Gas - USA
August 24, 2009
www.aspo-usa.org

Commentary: Interview with Tom Whipple

Tom Whipple, retired CIA analyst and editor of this newsletter, will be a speaker at the ASPO-USA conference this October 11-13. When called up and ambushed for this interview, he immediately said he thought the idea qualified as "the dumbest idea of the week," but eventually assented. From his home just outside Washington D.C. in Virginia, the amount of information that Tom single-handedly has gathered and circulated about the unfolding peak oil story is extraordinary. For his relentless efforts, ASPO-USA has named their award for volunteer of the year the Whipple Award.

***Question** (from Steve Andrews): when did you first become aware of the peak oil phenomenon?*

Tom Whipple: I think it was the 1998 article in *Scientific American*, by Colin Campbell and Jean Laherrere ["The End of Cheap Oil"]. This was the first time I became aware that this was serious. Prior to that, I had read a little about this in *The Limits to Growth* [1972], but that disappeared for about 25 years. Then, not much happened until 2004, when everything started moving rapidly: prices started flying up, the peak oil movement started ramping up, Peakoil.com and The Oil Drum started right about then. So I started to follow the information flow.

***Question:** When did you start writing about the peak oil story?*

Whipple: The first thing I got involved with was writing a few columns for a local newspaper, the *Falls Church News Press*. For years the editor had asked me to submit some material. I finally asked him if he would publish something on peak oil. Just that week, a big story on peak oil had been in Rolling Stone, a review of *The Long Emergency* by Jim Kunstler, and the editor was quite taken by it, so he said "go ahead." That was in early 2005, and I've been writing a column a week ever since; with just a couple of breaks, I must be up over 225 by now. I've been exploring a wide range of topics related to peak oil—not so much the geology, but what some of the implications are and how we're going to get through this. Every week something new pops up. This week came the announcement that the world's oil can be replaced by growing something akin to algae; whether this can pay off or not I haven't a clue, but it shows that there are a lot of people out there working on a bunch of technologies.

***Question:** When did you start assembling The Daily Countdown? [This was the precursor to the present Peak Oil News, the daily that Tom has assembled for ASPO-USA since Feb. 2006.]*

Whipple: First, I started doing the Virginia News when the major newspapers went on the internet back in 1996. My only claim to fame is that I was the first guy to recognize that it's not too difficult to go through the 25 or 30 of the major Virginia papers every morning, pick out the important stories and send them out in a newsletter. Today I've got about 2500 people reading it, including lots of editors and reporters, and it's just all by word of mouth. So when the peak oil movement came along about seven or eight years later, I had the software and processes worked out to create the same thing there; going from critical stories around the state to global stories about energy wasn't actually that much of a shift when I started it in early 2005.

***Question:** Did anything in particular trigger your start of the Daily Countdown publication?*

Whipple: I think I noted early on in The Oil Drum or another site when someone posed the question "what can we *do* about peak oil?" And someone wrote back, "*tell* people about it." Then I thought, "oh I know how to do *that*," so I immediately designed my own little peak oil newsletter. Soon afterwards I checked with 50 or 60 leading newspaper reporters and editors who were reading my Virginia News. I wrote that I was starting a new newsletter about peak oil and asked if any of them would be interested in reading this new publication that was free, just like the Virginia News. The

P-090-015

response to that query was exactly zero. Not a single reporter or editor seemed to care about peak oil. Yet when I missed my first mail-out of the Virginia News a couple of weeks ago—for technical reasons—the reporters went absolutely berserk.
By the time of the first ASPO-USA conference, I had about 100 subscribers for the Daily Countdown. After the conference you asked me what could we do in terms of a publication. I said this could make a good foundation for a weekly publication; we just sift through the material we collected during the week, find the most important stories, and highlight those in the weekly.

Question: *Give us a little of your background at the CIA that helps these information searches.*

Whipple: I did a whole variety of things there. I drafted National Estimates for a while. I was an analyst for a while, working on individual countries. I didn't have anything to do with oil up there. I spent a lot of time working on current intelligence, which was basically the daily publications.

Question: *What about your involvement with the presidential briefing papers?*

Whipple: There was a publication prepared every day called the President's Daily Brief. One of my jobs for years was to babysit the Brief over night; it was prepared during the day, but not printed until 5 a.m. What looked black at 5 p.m. in the evening might look white by 4 a.m.—an army that we thought, in the evening, wouldn't cross a border might have done exactly that during the night. So I had a lot of experience sifting through a vast flow of information from around the world. Following the peak oil story is very similar to what intelligence officers do. But 30 or 40 years ago, when I started doing this, you couldn't access this information you needed on a computer in your basement. You had to be in a government office with banks of teletypes clacking away and reports coming in from a dozen wire services and 100 embassies around the world. After sifting through a flood of information for years, you get a feel how to go through it quickly and how to spot what's important for policy makers.
To a certain extent, that's what some of us are doing in the peak oil realm, but now we can get information from the internet—there's so much out there. Before the internet, if magazines and newspapers didn't want to pick something up, you never heard about it. That's why the peak oil story has been an internet phenomenon: there is absolutely minimal information on it in the newspapers, in part because it's controversial. And there are many that think there will be technology that will overcome the problem. Many of us who follow the peak oil story don't think so; we think that oil depletion is going to overcome technology and new investment in the near future

Question: *So you don't think technology will be the cavalry riding over the peak oil hill?*

Whipple: In the peak oil realm, you have the doomer side and techno-fix side. The doomers tend to think peak oil is going to tear society apart. The techno-fix group thinks there is going to be something that comes along that helps smooth us into the post-fossil-fuel world, though they're not sure what it will be. I'm somewhat in the middle. On the technical side, there are a lot of things that can be done, no question about it. All of the energy we use comes from or came from the sun—or geothermal, or the Big Bang way back—so we just have to find the smartest ways to convert it and put it to use. We have to get by with a lot less energy—we can cut consumption by about a third without any real hardship…it's the main thing we can do in the near term without spending too much money. Then we get around to collecting energy in other ways, shapes and forms. So that's where I am personally on peak oil right now.

Question: *What do you anticipate will be the future for the airline and trucking industries?*

Whipple: I think they are going to have a lot of trouble. They almost went under last summer. The energy price crashes last fall helped these industries keep bumping along, but airline seats are down around 13 percent. I think we're looking at more of the same. Right now I'm looking into the relationship between much too much credit, for these and other groups, and peak oil. I just don't see how we can get out of this recession in any recognizable form. The minute you have a small recovery, oil prices will shoot up and we'll have the same problems again.

Question: *What will it take to wake people up? Just responding to more high prices?*

P-090-015

Whipple: I don't think anything else can do it but high gasoline prices. When they are back up at $4 a gallon, we'll start paying attention again, but prices will eventually grow from there, which will mean people will have to start cutting back, with continued painful economic consequences.

Question: *You've briefed a lot of elected officials about peak oil. How have they responded?*

Whipple: I've talked with the governor, one of our senators, a number of congressmen, a number of state-level officials, and other officials over the years. It's the same story; most people believe what I'm saying but they really have trouble internalizing the significance of all this. Everyone asks, "what are our alternatives?" They've heard of ethanol and coal to liquids and electric cars and other potential solutions, but they haven't heard that these technologies cannot happen quickly. Oil production will likely drop a lot faster than the economy's ability to invest in and bring on alternatives. It would take 25 years to replace the fleet with plug-in hybrids, etc., if we could afford to do it, given the shape of the economy over that time frame. More people are starting to understand this, but they don't quite get that it's going to happen soon.

Wrap: *Tom, thanks for your time.*



as we move beyond the age of oil and beyond the economy that is driven by the age of oil, we enter an entirely new world - there really are frankly no experts anywhere who can come forward and say exactly what we do in this situation - it is entirely new to everybody's experience - there are no investors who can say this is a good investment in this situation, there are no politicians who can say this is how we should behave in this situation, even in a humble business way there is no business that can plan its future because every single aspect of its future is going to change and so we are left with a sort of vacuum
-- Colin Campbell, founder of the Association for the Study of Peak Oil www.peakoil.net
quoted in "Peak Oil: Imposed by Nature"

P-090-015 http://www.postcarbon.org/blog-post/165463-alaska-and-energy

Alaska and Energy
Posted Oct 26, 2010 by Richard Heinberg



During my recent visit to Anchorage, Alaska to speak at that city's Bioneers satellite conference, the friendly locals seemed eager to educate me about their local energy issues. Some of what I learned struck me as important to share with a wider audience.

Alaska is, of course, a huge energy exporter. Crude from the North Slope saved America's energy bacon back in the '80s, helping to lower world oil prices and bankrupt the evil Soviet empire. **Production there has declined from a peak of over two million barrels per day to only 600,000 or so today. Once the flow drops below 500,000 barrels, there will be problems with icing in the Trans-Alaska Pipeline system.** Not good.

The state's economy is based almost entirely on resource extraction. Everyone gets a check annually from the Alaska Permanent Fund, set up in 1976 primarily by the efforts of then Governor Jay Hammond. High oil prices mean big dividends: in 2008-2009 extra-large payouts made Governor Palin look good to her constituents, though she was in no way responsible.

Alaska has enormous opportunities for renewables—wind, microhydro, geothermal, tidal, even solar. But these are far from being adequately developed, and progress in that direction will take time and lots of investment—a dramatically higher pace of investment than is currently evident.

Anchorage (by far the largest city in the state) faces a particular challenge with natural gas: currently nearly all houses are heated with gas, but supplies from Cook Inlet will run low in two years, even sooner with an abnormally cold winter. Most options to replace current sources (more drilling, LNG, alternative energy) will take longer than two years to develop.There is no serious planning for what to do about this.

P-090-015

Then there is the situation of the native villages. On one hand, the indigenous peoples of the north might seem well placed to weather the changes ahead as industrial society succumbs to peak oil, peak coal, and peak gas: they have cultural traditions of self-sufficiency, small populations relative to land area, and access to lots of wild protein on the hoof (moose, caribou). However, as James van Lanen of Alaska Department of Fish and Game wrote to me in an email just the other day:

"Alaska Native villages are in a very precarious situation. These remote villages are only accessible by motorized travel via air or watercraft. They are entirely dependent upon fossil-fuel systems for goods and services: food, heat, health care. They have no contact with the outside world without fossil fuels.

"Some villages obtain more of their food resources from wild sources than others. It would be safe to say that on average 80% of the protein consumption in a village is from wild sources. Berries and Plants supplement some part of the overall diet but this is small. The two important things to consider are (1) much of the food consumed comes from industrial sources and is shipped in via small aircraft and (2) wild food harvests are currently almost entirely fossil-fuel dependent (there is a well-embedded 'machine culture' in native villages; I believe that there is no extant ability to obtain significant amounts of wild foods without the use of machines)..."

"Peak Energy will hit Alaska villages sooner and more intensely than many other places. Fuel is already up to $9 per gallon in some places. As it becomes uneconomical for current supply operations to continue the industrial resources these villages rely on will fizzle out."

"Most village people are aware of their complete dependence upon fossil fuels. Many elders foresee a future collapse due to increasing costs and modern dependence. However, there is no general awareness of the phenomenon of Peak Energy in these communities. There is no awareness that the entire system may break down. Alaska villages desperately need to become educated in what we are facing."

I came away from my too-brief sojourn in Anchorage with both a deep appreciation for this land of great natural beauty, contrasts, and extremes, and an equally deep concern for how Alaskans will deal with their enormous energy challenges. Some of those challenges are going to present themselves forcibly in the very near future.

P-090-015

http://dieoff.com/page133.htm

This Paper is Issue #3 in a Series of Studies
Based on the World Oil Forecasting Program
(A PDF Version of this paper is available at http://www.dieoff.com/page133.pdf)

THE WORLD PETROLEUM LIFE-CYCLE

Richard C. Duncan[1] and Walter Youngquist[2]

Presented at the PTTC Workshop "OPEC Oil Pricing and Independent Oil Producers"
Petroleum Technology Transfer Council
Petroleum Engineering Program
University of Southern California
Los Angeles, California
October 22, 1998

Abstract

The world oil production peak, we assume, will be a turning point in human history. Our goal is to predict the world peak. To accomplish this goal, we have developed (to our knowledge) a unique new procedure based on oil production data, data analysis, conventional formulas, and heuristic knowledge. It comprises (1) a program, and (2) a method.

The program uses the historic oil production data and predicts by statistical and heuristic techniques future production for the world's 42 top oil-producing nations (each modeled separately), grouped into 7 regions, and the world. The method is to build up a series of forecasts which, taken together, will inevitably converge on the peak. This paper presents the third in this series of forecasts -- designated 'Issue #3.'

The peak production year and the expected ultimate recovery for each nation, seven regions, and the world are given in Table 1. Figure 1 graphs the world oil production life-cycle with the peak in 2006. Table 2 gives similar information for each region. Figures 2-8 graph the life-cycle for each region with peaks from 1985 for North America to 2011 for the Middle East.

Middle East & non-Middle East and OPEC & non-OPEC categories are compared in Table 3. Figure 9 graphs the Middle East & non-Middle East. Figure 10 graphs OPEC & non-OPEC.

Figures 11 and 12 depict by simulation whether or not new oil discoveries can delay the world peak. If so, by how much? Figure 13 is a 'phase diagram' that maps, as it were, our crooked route to the world oil summit. All tables and figures are discussed in the text.

We believe that a 'base-camp' and a series of higher camps must be established before finally ascending to the summit. 'Encircling' we call it, as illustrated by the three forecasts we've made so far. Specifically, the 1996 Issue #1 put the peak in 2005; Issue #2 put it in 2007; Issue #3 (this paper) put the peak in 2006. Of course the peak could occur before 2005 or after 2007. Perhaps 10 camps will be required. Maybe more.

En route to the summit, four predictions that we have made have since proved consistent with trends and events: Asian economic crisis, non-OPEC peak year, world peak inertia, and Caspian dry holes.

All the models are available free on the Internet at http://www.halcyon.com/duncanrc/

Looking ahead: The new forecasting method, we believe, can successfully predict the production life-cycle of any of the fossil fuels, including oil, gas, and coal.

[1]Institute on Energy and Man; Seattle, Washington, duncanrc@halcyon.com
[2]Consulting Geologist; P. O. Box 5501, Eugene, Oregon, 97405

P-090-016

Comments on the Draft Environmental Impact Statement Columbia River Crossing Portland, Oregon & Vancouver, Washington

by Mark Robinowitz, www.road-scholar.org
Box 51222 - Eugene, Oregon 97405 - mark@permatopia.com
July 1, 2008

Summary: Peak Oil and Peak Traffic Alternative 2
Troubled Bridges Over Water: Transportation Triage 3
Peak Traffic: The Achilles Heel of Highway Expansion Plans 5
Vehicle Miles Traveled (VMT) has Peaked 7
SDEIS needed to address "new circumstance" of Peak Oil & Peak Traffic 9
- Council on Environmental Quality regulations implementing NEPA 9
- Federal Highway Administration regulations about NEPA 9

The End of the Age of Oil: growth is over 9
- why alternative fuels and efficient cars won't make much difference 10

DEIS mention of Peak Oil is inaccurate 11
2030 design year is past peak 12
- Peak Oil causing Peak Traffic 15
- Peak Asphalt 17

Climate greenwash: a quiz 17
Saving Oil in a Hurry: carpooling is part of the answer 19
NAFTA Superhighway - ISTEA, TEA-21, SAFETEA-LU 20
- Corridors of the Future program includes CRC and upgrading I-5 in California 22
- Washington Commerce Corridor 26

Tolling without tollbooths: the J. Edgar Hoover Memorial Bridge 28
Coalition for a Livable Future "Climate Smart" Alternative 28
Reviving the Rails: a best case Peak Oil scenario 30
Rebuttal of DEIS energy sections 36
Peak Asphalt 51
Spy Roads: Civil Liberties vs. Transportation Surveillance 52
- Geoslavery: GPS and technological tyranny 60

Attachments 78

P-090-016

Please see response to P-090-001.

P-090-016

Summary: Peak Oil and Peak Traffic Alternative

I support light rail transit across the river into Vancouver.

I support expanding this project to include Amtrak and freight rail, including consideration of existing plans for high speed passenger rail between Eugene and Vancouver, B.C.

I support improved bus public transit to connect people to the rail stations.

I support paying for the transit systems by redirecting highway funds and increasing gas taxes (the original light rail line to Gresham was paid for with money appropriated for the Mount Hood Freeway). Rebates need to be considered to mitigate these impacts on lower income people. There is no technical reason why public transit should not be free.

I do not support a wider, 12 lane bridge.

I do not support a surveillance system on the existing bridge (or on a new bridge) to keep track of everyone's travels through RFID, Automatic License Plate Recognition and / or GPS enabled "mileage tax" tracking systems.

I do not support adding "collector - distributor" lanes on I-5 on either side of the river or on any replacement bridge, if one is built to replace seismically unsafe structures.

I do not support traffic analyses that assume substantial rises in travel demand even though we have reached Peak Oil and Peak Traffic.

A supplemental draft environmental impact statement (SDEIS) is needed to factor in Peak Oil and peak traffic, which invalidate the traffic growth projections used for this project.

Before the rubber stamps are used, the FHWA, ODOT, WSDOT and local governments must consider that **the National Environmental Policy Act states that if there are "new circumstances" that impact a project, then they need to be factored in to the analysis. The fact that we have reached the end of cheap oil (peak oil) and the start of climate change needs to be factored into the long term "needs" analysis of the big bridge.**

The design year for this highway expansion is 2030 -- long after Peak Oil. Therefore, the traffic needs analysis needs to be changed to reflect the fact that there will be much less fossil fuel available for personal transportation on the downslope of "Hubbert's Curve."

ODOT / FHWA are planning to widen I-5 despite the lack of demonstrated need. The project is designed for twenty years in the future, not current travel demands, yet "peak traffic" has already happened and we are now at Peak Oil. Future increases in gas prices and decreases in gas availability will drop total vehicle miles traveled (the only question is how quickly). Therefore, there is no need to widen I-5 and no need to spend more money on a widened bridge and road.

If the existing bridges cannot be upgraded for seismic safety, then a replacement, permanent bridge should be built to the same number of lanes as the road on either side of the bridge -- three

P-090-016 lanes in each direction. This would save money that could be used toward fixing or replacing other damaged bridges such as the crumbling Sellwood bridge.

If the DOTs ignore geological (and financial) realities, then it would be best to save our money by dispensing with the pretense of public input and let the DOTs do anything that it wants without the illusion of oversight. As the lawyer said to the oil man in the film SYRIANA, "we are looking for the illusion of due diligence."

Troubled Bridges Over Water: Transportation Triage

"Another flaw in the human character is that everyone wants to build but nobody wants to do maintenance"

-- Kurt Vonnegut

The notorious collapse of the I-35W bridge in Minneapolis in 2007 points out the dangers of deferring maintenance in favor of building more and more roads -- a change in priorities is long overdue.

P-090-016



Oregon's highway network is riddled with aging bridges that no longer can support existing traffic flows because their structures are wearing out. As we shift from an era of cheap energy and abundant economics toward the era of expensive energy and conservation, it will become more difficult to repair or replace cracked bridges. **Spending billions to widen I-5 when there is a huge backlog of damaged bridges is dangerously neglectful of the need to keep the existing network functional.**

One ODOT planner told me a few months ago that the Department's priority was to keep I-5, I-84, Route 20 and Route 97 intact, and that other routes were not as much of a priority. **A better approach to "transportation triage" would be to focus on maintaining the existing**

P-090-016

system before even planning to make expansions to capacity, even without considering the issues of Peak Traffic.

Oregon still allows heavier trucks on its roads than California or Washington permit. Shifting some of this freight traffic to railroads would reduce energy consumption and protect our highway bridges. This change needs to be seriously factored in to the SDEIS for the Columbia River Crossing.

We can choose as a society to either expand the highway system some more (NAFTA Superhighways, more Outer Beltways and bypasses, etc) or focus on making sure that the existing network can be maintained after Peak Oil. Unfortunately, few politicians highlight the need to make AMTRAK a serious transportation system for efficiently moving people. A national priority for quality train service would create a lot of good jobs, reduce energy consumption, and make it more likely that the United States will be able to mitigate the inevitable impacts of the end of the petroleum era. Proposals for the 80 new "corridors" in the SAFETEA-LU highway expansion law are a preventable trillion dollar misallocation of resources.

It is likely that about $1 trillion has already been spent to destroy the nation of Iraq (if preparations for the conflict are included), home to the planet's second largest oil reserves. This is more than half of the cost that has been estimated for rebuilding the tens of thousands of deficient highway bridges that are aging and becoming dangerous.

There are several serious - but languishing - proposals for high speed rail in the United States that would be similar to European and Asian networks. Building all of them would probably cost less than the money spent on the War on Iraq.

P-090-017

Peak Traffic:
The Achilles Heel of Highway Expansion Plans

As the world passes the peak of global petroleum production, gasoline prices are likely to increase to the point that traffic demands on roads will be reduced. While it is impossible to accurately predict the price of fossil fuels in the design year of 2030, it will be surprising if gasoline is not rationed on the downslope of the Peak Oil curve (either directly by ration cards or indirectly by pricing it out of reach of many who currently consume it). While so-called alternative fuels exist and there are vehicle designs much more efficient that current models, they are only going to be able to mitigate the energy downslope. Carpooling is going to be more important than hybrids.

US federal transportation law requires that new federal-aid highway projects consider the traffic demand twenty years in the future. In the 1991 ISTEA law, a provision was added to federal highway approvals that requires all highway plans in a metropolitan area to fit into a regional long range transportation budget to avoid a form of fiscal segmentation. If a metro area wants lots of new roads, they have to show how the projects could be paid for (federal and local funds) over a 20 year period. Approving a project that lacks funding is therefore a form of segmentation. The funds need not be available when construction begins, but the entire project has to fit within a constrained transportation budget - a process similar to buying a home with a mortgage (a home buyer has to show their potential ability to raise all of the funds over the span of the loan).

P-090-017

Please see response to P-090-001.

P-090-017

While no one, not even Dick Cheney, knows precisely what will happen with Peak Oil, to ignore it completely and make more "growth" projections and traffic models that assume constant supplies and pricing of petroleum is delusional. **When FHWA finally requires energy analyses in NEPA documentation, they could examine a range of scenarios: gasoline at $10 per gallon in 2030, gasoline at $100 per gallon in 2030, and gasoline not available to the public in 2030 (only to elites and the military)**

As the world passes the peak of global petroleum production, gasoline prices are likely to increase to the point that traffic demands on roads will be reduced. While it is impossible to accurately predict the price of fossil fuels five, ten, or twenty years in the future, it will be surprising if gasoline is not rationed on the downslope of the Peak Oil curve (either directly by ration cards or indirectly by pricing it out of reach of many who currently consume it). US federal transportation law requires that new federal-aid highway projects consider the traffic demand twenty years in the future -- so the reality of Peak Oil and climate change means that the continent wide rush to build more bypasses, wider bridges, Outer Beltways and NAFTA Superhighways will not be needed. As of July 1, 2008, there are no road projects known to this writer anywhere in North America that have been scaled back or canceled because of Peak Oil and Peak Traffic.

The website **www.road-scholar.org** suggests some political and legal strategies to prevent this trillion dollar misallocation of resources so that real solutions can be implemented:

- repair or replace worn out bridges (but not with wider bridges) while we still have oil
- invest in public transit & Amtrak
- get ready to travel less
- grow food in the cities (community gardens) and suburbia (food not lawns) to reduce oil dependence of industrial agriculture

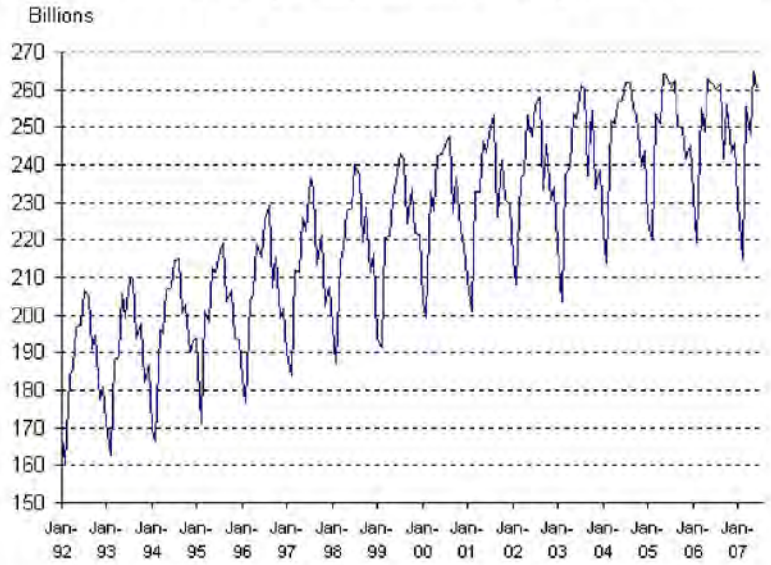
Euan Mearns on June 11, 2008 - 4:42pm
Its really hard to come to terms with the number of corporations, government agencies, consultancies, civil service departments and politicians who seem incapable of comprehending a trend break or trend reversal. Collectively they would have been incapable of working out that the wheel may change transport.
http://europe.theoildrum.com/node/4130#comment-359871

P-090-017

Vehicle Miles Traveled (VMT) has Peaked

Three dollar a gallon gasoline caused the constant increase in traffic to stop, four dollars a gallon gasoline has precipitated an overall decline in traffic levels.

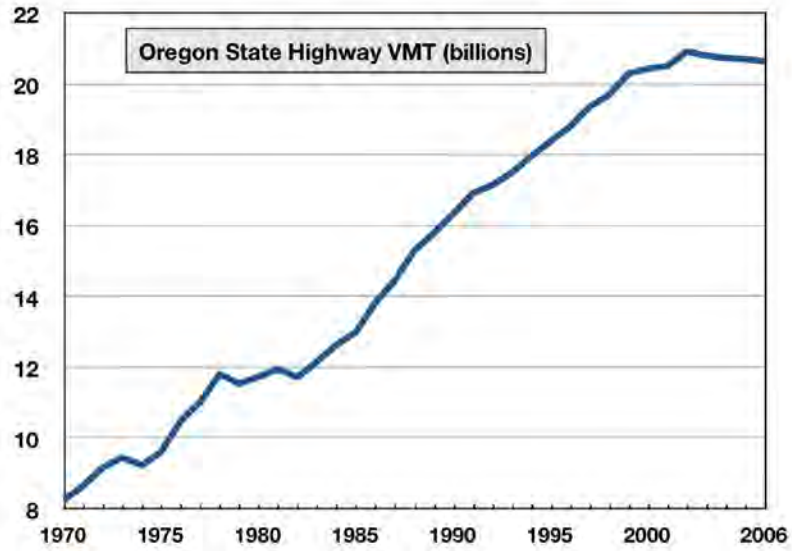
US Department of Transportation Bureau of Transportation Statistics



www.bts.gov/publications/white_house_economic_statistics_briefing_room/ august_2007/ html/highway_vehicle_miles_traveled.html

national VMTs peaked about two years ago
traffic levels vary through the year
(there is more driving in the summer than the winter)

P-090-017



Oregon state highway VMT data from
www.oregon.gov/ODOT/TD/TDATA/tsm/vmtpage.shtml

1973: dip due to Saudi oil embargo
1979: dip due to gas lines after Iranian revolution
2002: peak traffic on Oregon highways

This chart from ODOT shows that traffic levels on Oregon State Highways peaked about four years ago, and is on a plateau, mostly because of the increasing price of oil. The US Dept of Transportation Bureau of Transportation Statistics shows that national Vehicle Miles Traveled peaked in 2005. In May 2008, the Federal Highway Administration stated that March 2008 was the sharpest decline of traffic recorded since they started keeping detailed records - it was 4.3 % less than March 2007. We are on a plateau of traffic that will last as long as oil remains relatively affordable.

The current dip in VMT is not temporary,
it is more like climate change, a permanent shift in the way things work.

P-090-018

SDEIS needed to address "new circumstance" of Peak Oil & Peak Traffic

NEPA mandates that a "Supplemental" EIS must be prepared if there are "new circumstances" not anticipated when the scoping process was conducted. Surely reaching the peak of petroleum production worldwide is an important circumstance for a transportation project allegedly designed for travel long past the peak of petroleum.

If FHWA included Peak Oil into environmental analyses for highway projects, this could create a seismic shift in transportation planning across the United States, allowing for honest public discussion about energy and transportation policies. There are several ways this shift could happen: a successful Federal lawsuit forces FHWA to include Peak Oil, the start of gasoline rationing makes transportation planners consider alternatives, or a change in national policies (probably the least likely in the near future).

Council on Environmental Quality regulations implementing NEPA

40 CFR 1502.9: Draft, final and supplemental statements.
(c) Agencies:
(1) Shall prepare supplements to either draft or final environmental impact statements if:
(i) The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or
(ii) There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

Federal Highway Administration regulations about NEPA

23 CFR § 771.130 Supplemental environmental impact statements.
(a) A draft EIS, final EIS, or supplemental EIS may be supplemented at any time. An EIS shall be supplemented whenever the Administration determines that:
(1) Changes to the proposed action would result in significant environmental impacts that were not evaluated in the EIS; or
(2) New information or circumstances relevant to environmental concerns and bearings on the proposed action or its impacts would result in significant environmental impacts not evaluated in the EIS.

P-090-019

The End of the Age of Oil: growth is over

Peak Oil does not mean that civilization is about to run out of oil. Instead, we are near (or at) the point where continued growth of petroleum combustion no longer can be maintained, which will have profound consequences for the global economy that is dependent on exponential growth of nearly everything (especially of money supplies). Energy creates the economy, a physical limitation rarely acknowledged by economists. Peak Oil is also the point where the maximum amount of economic "growth" is reached -- and ideally a turning point where we can decide to use the remaining half of the oil as a bridge toward a more sustainable way of living. It

P-090-018

Please see the responses to Mr. Robinowitz's comments above.

P-090-019

Please see response to P-090-001.

P-090-019

would require enormous energy, money and people power to reorient away from NAFTA Superhighways toward investing in bullet trains, away from dirty fossil fuel technologies toward efficiency and renewable energy systems, away from resource wars and toward global cooperative efforts to reduce our collective impact on the planetary biosphere.

why alternative fuels and efficient cars won't make much difference

Renewable energy systems are largely focused on generating electricity. Transportation systems in the CRC area are almost entirely based on burning liquid fuels, which are not generated by solar PV power or wind turbines.

A bigger problem is that by the design year of 2030, natural gas supplies from the western US and Alberta are likely to have dropped so low that they will no longer be able to be used to generate electricity -- the remaining gas will be needed to heat buildings, especially in the colder climates where the gas is extracted from. Whatever renewable energy systems are installed between now and then will need to replace the substantial inputs that natural gas has for the western electric power grid at the same time that there is less available energy to manufacture solar panels and wind turbines.

All of the major car companies have developed much more efficient vehicles (Greenpeace, "The Environmental Impact of the Car," 1992), with many models around 100 mpg. VW even has a small model that is highway rated that gets about 250 mpg -- the VW CEO drove it to their annual stockholder meeting a few years ago. While technological shifts may help mitigate the energy crisis after Peak Oil, it cannot eliminate the problem. There are no factories to make these vehicles. There are no capital investments to fund the conversion of existing factories to make hyper-efficient cars. The existing fleet of vehicles are not going to be instantly eliminated in favor of efficient cars, as the owners have invested heavily in their current models -- someone who bought a $50,000 SUV is not easily going to be able to absorb the loss by purchasing a new car that is more efficient. At best, the investment in more efficient vehicles may slow the decline of VMTs on the Peak Oil downslope -- but it cannot prevent that decline. There is also the problem of substantial use of oil and mineral ores to manufacture new cars, even efficient ones. Carpooling is a more promising short term mitigation than hoping for 100 mpg cars.

The main source of "liquid fuels" likely to be promoted in Cascadia is conversion of third growth forests and tree plantations to biofuels. While this could make sense on a small scale, as the downslope of Peak Oil becomes more obvious, there will be immense pressure to liquidate forests and convert them into fuel for cars and trucks and other vehicles. Widespread deforestation to create liquid fuels from tiny trees could result in massive carbon dioxide generation -- since the best form of carbon sequestration is to allow forests to return to old growth conditions. Here are some references to consider on this topic:

Mark Harmon
Professor and Richardson Chair of Forest Science
Oregon State University
www.cof.orst.edu/cof/fs/people/faculty/harmon.php
http://outreach.forestry.oregonstate.edu/silvopt/abstracts/harmon..htm
Forest Management Strategies for Carbon Storage

P-090-019

Olga Krankina
Assistant Professor, Sr. Research, Forest Management, Forest Ecology
Oregon State University
www.forestry.oregonstate.edu/cof/fs/people/faculty/krankina.php
several articles by Professor Krakina

Doug Heiken
Oregon Wild
www.oregonwild.org/oregon_forests/old_growth_protection/forests-global-warming/oregon-wild-report-on-forests-carbon-and-global-warming
Oregon Wild Report on Forests, Carbon and Global Warming
"The Straight Facts on Forests, Carbon, and Global Warming"
Executive Summary
Part I. Background: What determines global temperature and climate?
Part II. How does carbon move in and out of the atmosphere?
Part III. How Will Climate Change Affect the Pacific Northwest?
Part IV. How will climate change affect ecosystems, forests, and trees?
Part V. Will the Forests of the Future Become Carbon Sources or Carbon Sinks?
Part VI. What Can We do to Protect Forests from the Perils of Climate Change?
Part VII. Logging Releases Significant Amounts of Carbon.
Part VIII. What Can We Do To Increase Carbon Storage in Forests?
Part IX: Forest Management Recommendations
Part X. What about Forest Fires?
Part XI. Conclusion
Appendix: Myths & Facts about Forests and Global Warming

Lance Olsen
former president, Great Bear Foundation. Missoula, Montana
www.tidepool.org/features/forest.climate.cfm
Swiss Army Knives
How Deforestation Changes the Climate
by LANCE OLSEN [posted.5.10.01]

DEIS mention of Peak Oil is inaccurate

Laws of political physics:
For every expert, there is an equal and opposite expert.
Experts will travel in a straight line over a cliff unless external forces overwhelm inertia.
Experts will try to maintain equilibrium even when the system has become too unstable .
A critical morass of experts are impervious to inputs from outside the bureaucracy.

The CRC Draft EIS is probably the first to acknowledge the reality of Peak Oil, but unfortunately, the writers of this section failed to describe it accurately. The DEIS suggests that there is a maximum scenario for the year 2030 of $100 a barrel for oil, yet this figure was reached on the first trading day of 2008, four months before the publication of the DEIS. It is

P-090-019

astounding that there is no mention in the DEIS of the substantial rise in oil prices during preparation of this report.

One bright spot in the DEIS is the mention of the Department of Energy's Hirsch Report (2005), although the DEIS failed to mention the conclusions of this analysis. The Hirsch Report stated that we would need twenty years to mitigate the impact of Peak Oil, even if we were using toxic technologies such as coal-to-liquids and tar sands. While the Hirsch Report did not specify an opinion on when the Peak would be, oil production worldwide has been essentially flat since 2005 as new oil fields have had a difficult time making up for declining oil fields in the North Sea, Alaska, the Persian Gulf and other areas. Most geologists who have looked closely at the facts have concluded that we are now past the peak for "conventional oil" and almost at the peak for "all liquids" - the latter being a euphemism for including tar sands, natural gas liquids and other liquids that require nearly as much energy to produce as they contain. The consensus in the scientific community is that the era of easy to extract oil that has the maximum "energy return on energy invested" is over, and now we are entering the era of difficult to extract, expensive oil that will have less return on energy invested.

The largest oil fields in the world are all in obvious decline. Here in the western hemisphere, the largest single field is Cantarell in the Gulf of Mexico (on the Mexican side), and it peaked around 2004 (the Association for the Study of Peak Oil and Gas - USA reports that Cantarell has dropped about 33% in the past year). The Alaska North Slope at Prudhoe Bay peaked in 1988, two decades ago, at about three quarter of a billion barrels for the year. In 2006, less than 300 million barrels flowed through the Alaska Pipeline. Even if the Arctic National Wildlife Refuge were opened to drilling, that development would merely slightly change the shape of the downslope. The Earth is finite, therefore there is only so much oil to extract.

2030 design year is past peak

The key points for understanding Peak Oil:

(1) the oil will take decades to run out, peaking is not the same as running out
(2) the exact shape of these curves will probably be different than these predictions,
(3) the issue is when supply no longer keeps up with demand, not when it runs out, and
(4) after the peak, the OPEC countries in the Middle East will have most of the remaining oil

Peak Oil is not about "when the oil will be gone" but rather when demand begins to outstrip supply and production / extraction peaks globally. There probably will be oil extraction for several more decades, although the current perceived abundance (one can buy as much oil as one can afford) is likely to last only a few more years. While petroleum geologists debate the exact timing of the global peak (ranging from essentially now through the middle of the next decade), there isn't any debate about the reality of Peak Oil. Even the most pollyanna view puts the peak at around 2030, although the most experts estimate that somewhere between 2005 and 2012 is more accurate. The pessimists among the geologists who said in the late 1990s that 2010 would be the peak may have been wrong, since there is evidence that 2000 may have been the precise peak, with the rest of this decade being a "plateau" close to 2000 levels before the extraction rates begin their inevitable decline. One factor for determining future levels will be economic forces -- if the global economy crashes into a depression, this would reduce energy consumption rates, making the peak lower and longer lasting (the best possible scenario for using some of the

P-090-019

oil as a bridge toward the renewable energy, locally based society). If the economy heats up, then the peak could be higher but shorter, with the downslope coming sooner and steeper. Whatever the exact year, the days of wasteful overconsumption are limited

The only "debate" about peak oil is the exact timing -- from a long term historical perspective, it does not matter whose predictions about the exact year of peak and decline ultimately prove to be correct.

ASPO's latest estimate is the world "peaked" for conventional oil in 2005, and the peak for all oil will be in 2010. The all oil figure includes unconventional oil such as heavy oil (tarsand / oil shale), polar, deep water, and natural gas liquids. The world is now on the Petroleum Plateau, which will drop off sometime after 2010.

from the Association for the Study of Peak Oil, February 2008 (prepared 2008-01-04)

Colin Campbell, February 2008 issue of ASPO Ireland
www.aspo-ireland.org/contentFiles/newsletterPDFs/newsletter86_200802.pdf

ESTIMATED PRODUCTION TO 2100											End 2007
Amount			Gb	Annual Rate - Regular Oil						Gb	Peak
Regular Oil				Mb/d	2007	2010	2015	2020	2030	Total	Date
Past	Future		Total	US-48	3.7	3.1	2.4	1.8	1.0	200	1970
Known Fields		New		Europe	4.3	3.5	2.5	1.7	0.9	76	2000
1008	724	143	1875	Russia	9.7	9.7	7.8	6.2	3.9	230	1987
	867			ME Gulf	19	19	20	20	17	693	2015
All Liquids				Other	28	27	22	19	13	701	2005
1155	1345		2500	**World**	**65**	**62**	**55**	**48**	**36**	**1900**	2005
2006 Base Scenario				Annual Rate - Other							
M.East producing at capacity				Heavy etc.	6.5	11	5	5	6	212	2030
(anomalous reporting corrected)				Deepwater	6.5	12	11	6	1	68	2011
Regular Oil excludes Heavy Oils				Polar	0.9	1	1	2	4	52	2030
(inc. tarsands, oilshales); Polar &				Gas Liquid	7.7	8	9	9	10	261	2035
Deepwater Oil; & gasplant NGL				*Rounding*				-1	3	6	
Revised 04/01/2008				**ALL**	**87**	**94**	**80**	**70**	**60**	**2500**	2010

www.davidstrahan.com/blog/?p=57
PRIVATE INDUSTRY CONFERENCE FINDS MUCH LESS OIL
Posted on Friday, September 28th, 2007

(Podcast) A secretive gathering some of the world's biggest oil companies has concluded the industry will discover far less oil than officially forecast, according to an executive who attended the event, meaning global oil production may peak much sooner than many expect.

The Hedberg Research Conference on Understanding World Oil Resources was held by the American Association of Petroleum Geologists in Colorado Springs last November to try to reconcile widely divergent estimates of likely future reserves additions. In an interview with Lastoilshock.com, oil executive Ray Leonard said the majority view was that future oil discovery would amount to some 250 billion barrels, rather than the 650 billion barrels suggested by the United States Geological Survey.

P-090-019

www.energybulletin.net/25544.html
Published on 1 Feb 2007 by Bloomberg. Archived on 1 Feb 2007.
Simmons says global oil supply has peaked
by Rhonda Schaffler

Matthew Simmons, chairman of Simmons & Co. International in Houston, talked yesterday with Bloomberg's Rhonda Schaffler about the need to address energy use, his view that global supply has peaked and the likelihood oil prices could reach as much as $300 a barrel. (Source: Bloomberg)

[Transcription of the first few minutes of the interview]
Q: Tell me how you draw your conclusion that at this point we've hit Peak Oil.
A: If you look at the numbers and you follow what's going on starting with Mexico's giant Cantarell field which is now in a very serious state of decline and then you look at the North Sea and you see just the UK and Norway, it's pretty obvious to me that those three areas alone could actually decline by between 800,000 and 1 million barrels a day in 2007. That pretty well wipes out almost all the production gains coming onstream and in implicit in that it assumes that everyone else is flat.
So I think basically too many of our oil fields are too old. Too many now are in decline. The Middle East is basically out of capacity. they're some projects that are being worked upon, but most don't hit the market until 2008, 2009 and we're running out of time.
... I am firmly of the belief that over the course of the next year or two, this issue of peak oil will replace global warming as an issue that we're all worrying, debating and talking about.

FORMER PRESIDENT BUSH ENERGY ADVISER SAYS OIL IS RUNNING OUT
Robin Pagnamenta, Energy and Environment Editor
From The Times
June 30, 2008

The era of globalisation is over and rocketing energy prices mean the world is poised for the re-emergence of regional economies based on locally produced goods and services, according to a former energy adviser to President Bush and the pioneer of the "peak oil" theory.

Matt Simmons, chief executive of Simmons & Company, a Houston energy consultancy, said that global oil production had peaked in 2005 and was set for a steep decline from present levels of about 85 million barrels per day. **"By 2015, I think we would be lucky to be producing 60 million barrels and we should worry about producing only 40 million," he told The Times.**

His controversial views, rejected by many mainstream experts, suggest that some of the world's biggest oilfields, particularly in Kuwait and those of Saudi Arabia, the world's leading producer, are in decline. "It's just the law of numbers," he said. "A lot of these oilfields are 40 years old. Once they roll over, they roll over very fast."

Mr Simmons asserted that this, coupled with soaring global energy demand, meant that world oil prices were likely to continue rising. He said that even at present record highs of more than $140 a barrel, oil remained relatively inexpensive, especially in the US, the world's biggest market. "We are just spoiled rotten in the US," he said. "It's still cheap."

Rising prices will force a tectonic shift in the structure of the global economy by destroying the rationale for shipping many goods, such as food, over long distances, he said.

P-090-019

"This is already happening. In the US, our local farms, ranches and dairies are booming. They are having a huge comeback."

Mr Simmons set out a radical vision of the future, envisaging a society in which food and many other essentials are sourced and consumed locally and increasing numbers of people work from home. He claimed that the alternative was increasing political instability and conflict over the planet's diminishing resources. "We are living in an unsustainable society," he said. "If we don't change we are just going to start fighting one another...So let's just start assuming the worst and plan for it."

However, only this month, BP disclosed figures which indicated that the world had 1.24 trillion proven barrels of oil left in the ground - more than 40 years' worth at current rates of production. BP said that known global reserves had actually increased by 168.5 billion barrels, or 14 per cent, over the past decade. Tony Hayward, the chief executive of BP, said: "The good news is the world is not running out of oil."

BP blamed a lack of investment and access to reserves, rather than geology, for why global oil production was sputtering.

Mr Simmons claimed that many countries had overstated their reserves for political purposes and that so-called flow rates were a better indicator of recoverable volumes. He said that the quality of oil produced by Saudi Arabia and other big exporters was declining.

P-090-020

Peak Oil causing Peak Traffic

The 2005 Final Environmental Impact Statement for the Inter County Connector highway in Maryland, part of the long planned Outer Beltway around Washington, D.C., had this response to a comment that referenced Peak Oil as a reason not to build the road:

> It is speculative to assume that increases in gasoline prices will "reduce congestion." Evidence indicates that very substantial price increases might be needed in order to substantially change transportation choices and decisions. Price increases could cause a variety of responses which might not affect highway usage; e.g. production and acquisition of more fuel-efficient vehicles. The travel forecasts were made assuming a cost per mile for operating an automobile. Historically as the price of gasoline has increased the miles traveled per gallon of gas have also increased. In fact, gas costs less per mile traveled today than it did prior to the first oil embargo in 1974. Petroleum scarcity as a result of consumption in China is speculative.
> - Final Environmental Impact Statement, Inter County Connector (I-370), Maryland

This EIS was correct to state that planning for rising gas prices is speculative, but planning as if prices will remain constant for the next two decades is even more speculative.

It is not "speculation" to predict that higher gas prices will prevent traffic increases. Here is a small example of how this works, which shows that the price increases likely from Peak Oil will lower traffic demand considerably in the design year of 2030.

P-090-020

Please see response to P-090-001.

P-090-020

www.cnn.com/2006/AUTOS/11/30/gas_prices.reut/index.html
Americans drive less for first time in 25 years
Higher gas prices cut not only sales of SUVs, but also time spent on the road: study.
POSTED: 3:47 p.m. EST, November 30, 2006

HOUSTON (Reuters) -- High gasoline prices not only slowed fuel demand growth and cut sales of gas-guzzling vehicles in 2005, they also prompted Americans to drive less for the first time in 25 years, a consulting group said in a report Thursday.

The drop in driving was small - the average American drove 13,657 miles (21,978.8 km) per year in 2005, down from 13,711 miles in 2004

More riders crowd buses

The rising cost of driving sends record numbers to LTD, where human traffic jams the aisles

BY JEFF WRIGHT
The Register-Guard
Published: Thursday, April 6, 2006

TRAFFIC AT THE YORK TOLLS on the Maine Turnpike - a standard measure of tourism in the state - was down in June and even more in July compared with the same time last year. . . Traffic passing through the York tolls had increased every year until five years ago, when it became stable. This is the first time it has dropped significantly; the decrease was 5.3 percent when comparing June 2004 and June 2005, and 5.8 percent when comparing July numbers. . The national average price for regular unleaded gas was $2.41 a gallon, compared with $1.86 a year ago
http://pressherald.mainetoday.com/news/state/050813gasprices.shtml
www.maineturnpike.com/jpgraph/total_by_month.html
www.maineturnpike.com/jpgraph/yearly_totals.html

High gasoline prices filling bus, train seats
Tue Apr 25, 2006
By Bernie Woodall, Reuters

Some mass transit advocates hesitate to say the price spike has forced drivers onto public transportation, including Amtrak spokesman Cliff Black.

But in some cities where the car is undisputed king of transportation such as Houston and Los Angeles, public transportation ridership is up.

In Houston, home to many oil refineries, ridership was up 10.2 percent in the most recent fiscal year, said Houston's Metropolitan Transit Authority, which has a large bus fleet.

In Los Angeles, Metro Rail ridership rose 11.4 percent and the number of bus passengers increased 7 percent in the first quarter of 2006. About 1.4 million ride Los Angeles County buses and trains daily.

It's difficult to say how many are on board because of gasoline prices, said Dave Sotero of the Los Angeles County Metropolitan Transportation Authority.

P-090-020

"When gas prices go up, we do see spikes in ridership," said Sotero. "We're hopeful people who haven't used public transit, they will carry on riding even if gasoline prices drop," said Sotero.

Last week, the Washington Metropolitan Area Transit Authority in the nation's capital had the two highest ridership days in the Metrorail's 30-year history that were not linked to a special event. The highest day was April 20, with 780,820 riders, up 6.2 percent from a year ago.

But WMATA spokesman Steven Taubenkibel said it's hard to peg that on gasoline prices -- nice weather last week may have had more to do with it, he said.

These statistics do not suggest a major shift (yet) due to increasing gas prices, but they hint at much larger changes to come on the petroleum downslope.

Peak Asphalt

http://lcog.org/meetings/mpc/0806/MPC%205g1i_OregonianArticleonCostIncreases.pdf
Soaring costs throw Oregon road projects a curve
Rough road - Officials are facing steep price increases for asphalt and other materials
Monday, July 31, 2006
JAMES MAYER
The Oregonian

www.delmarvanow.com/apps/pbcs.dll/article?AID=/20060616/NEWS01/606160303/1002
Asphalt prices delay pressing road repairs
By Joseph Gidjunis
Staff Writer
The Daily Times, Salisbury, Maryland

www.duluthsuperior.com/mld/duluthsuperior/news/politics/14837423.htm
Fri, Jun. 16, 2006
Asphalt prices skyrocket, highway officials scramble to adjust
JOHN HARTZELL
Associated Press

www.ksla.com/Global/story.asp?S=5026843&nav=0RY5
SHREVEPORT, LA
Asphalt Prices May Mean Fewer New Shreveport Street

P-090-021

Climate greenwash: a quiz

The states of Oregon and Washington are planning to spend about $4 billion for a new, widened I-5 bridge across the Columbia River, which would also extend the Portland light rail a

P-090-021

Please see response to P-090-001.

P-090-021

couple more stops (across the river into downtown Vancouver). What did Oregon Transportation Commissioner Gail Achterman say about the environmental impacts of this expansion?

a. "The Columbia River Crossing project is a major forward step in our effort to reduce the carbon footprint of our transportation system"
b. "We are canceling the highway component of this project and diverting the funds toward public transit in metropolitan Portland and high speed passenger rail for Cascadia" (Eugene to Vancouver BC).
c. "The State of Oregon recognizes the seriousness of the Peak Oil and Climate Change crises, and we are going to implement the Oregon Transportation Plan's policy guidelines to prioritize fixing existing roads before building new capacity."
d. "The I-5 widening is part of the national NAFTA Superhighway proposals, so the state is opposing this proposal to encourage support for regional business instead of outsourcing our production to foreign sweatshops."

Historic and Forecast Gas Emissions in Oregon
Showing Proposed Goals

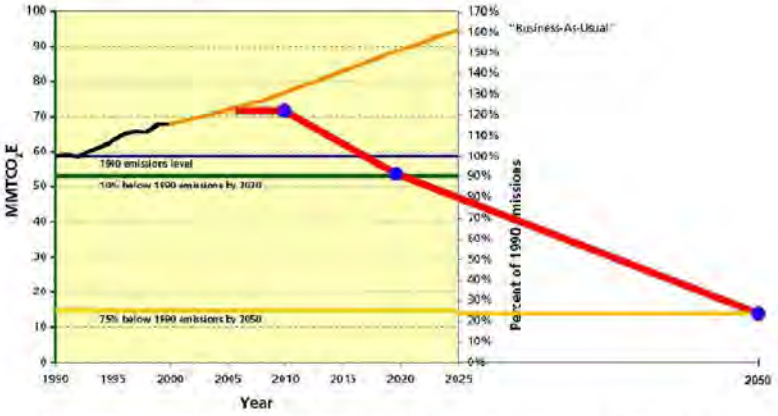


chart from ODOT of carbon pollution reduction targets through 2050. The black line includes the increases during the Clinton/Gore administration. Yellow upward line represents plans for continued "growth." Note that the shape and rate of the downslope almost mirrors the projected downslope of the Peak Oil curve.

In our new Orwellian age of greenwash, war is peace, ignorance is strength, and widening the Interstate highways will clean up the atmosphere. Building multibillion dollar bridges with huge amounts of steel and concrete is very energy intensive and generates a large amount of toxic pollution to manufacture the raw materials. Even building the light rail (and not the road bridge)

P-090-021

would increase carbon dioxide levels in the atmosphere. "Carbon credits" and "offsets" are linguistic tricks, since building a train or installing solar panels and wind turbines cannot sequester existing CO2 back into the crust of the Earth. Proposals to reduce the rate of increase of carbon pollution are not the same thing as removing soot from the atmosphere. The natural biological capabilities of carbon sequestration are already busy absorbing normal CO2 generation from animals and other natural sources, so they are unable to absorb CO2 and methane created by burning fossil fuels.

Instead, it appears likely that oil rationing (whether from price increases or official policy) and depletion is going to reduce the growth of carbon emissions. Calls to reduce carbon levels by various percentages by the year 2050 parallel almost exactly the expected reduction in oil production / extraction. Natural gas is likely to decline faster than oil -- at least in North America. Even coal has been exaggerated, with global coal extraction set to peak around 2025 -- although coal mining requires lots of oil (for transport) and a stable electric grid.

The SDEIS needs to look at the cumulative impact of building a 12 lane bridge, of the land use patterns that would be induced from the new, wider bridge, and the total toxic impact of building the largest option bridge.

Saving Oil in a Hurry: carpooling is part of the answer

In 2005, the International Energy Agency held a forum to discuss "Saving Oil in a Hurry." While in the long run fossil fuel supplies are going to gradually decline, there are numerous scenarios where sudden sharp downward levels of availability could happen -- conflict in oil exporting countries, severe hurricanes in the Gulf of Mexico offshore drilling areas, desire by oil exporters to reduce exports since oil will be more valuable in the future, a US / Israeli attack on Iran followed by Iranian disruption of oil flows through the Persian / Arabian Gulf. There are also plausible possibilities that some oil fields could see much more rapid decline that some planners are hoping for, especially those oil fields that are being pumped out with large volumes of water (a technique that works for a while but risks collapse of the oil field).

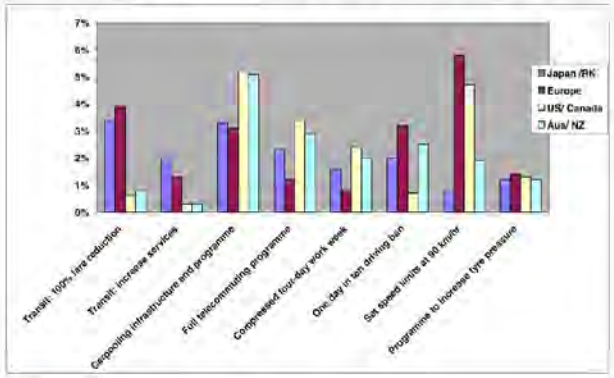
The Saving Oil in a Hurry report suggested that in the United States and Canada, carpooling would have greater energy reductions in the US than free public transit, although no one approach is sufficient. In Western Europe, free transit would have the single biggest reduction in oil consumption. All approaches will be needed, but the opportunity of using all of the seats in the existing traffic flow shows the potential for quick reductions of energy use -- an opportunity that is a social obstacle, not a technological problem.

Regardless of which geologists are ultimately proven correct about oil supplies, we need to prepare to live with much less energy consumption.

http://www.iea.org/textbase/work/workshopdetail.asp?id=210
Workshop: Managing oil demand in transport.
International Energy Agency
European Conference of Ministers of Transport
WORKSHOP: MANAGING OIL DEMAND IN TRANSPORT
Paris, 7-8 March, 2005

P-090-021

Percent reduction in total fuel use by IEA region, selected measures



Imperial College
London

NAFTA Superhighway - ISTEA, TEA-21, SAFETEA-LU

The NAFTA Superhighways are not ONE highway plan, they are a large network of new highways and expanded (existing) highways, a series of north-south interstate highways across the U.S. These new and expanded roads would stretch from Canada through the U.S. to Mexico (excepting certain East Coast routes that would merely connect to ports on the Atlantic or Gulf coasts).

The initial proposal for NAFTA Superhighways was in the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) Federal transportation law, but has now expanded in scope to encompass several "superhighways on steroids." Some of these oversized roads would have many car lanes, truck only lanes, parallel freight train lines, passenger train lines and utility corridors (electricity, oil, natural gas, water, etc).

ISTEA specified the first iteration of the "NAFTA Superhighway" -- to extend I-69 from Indianapolis (its current southern terminus) all the way to Mexico. Highwaymen from several states who each wanted their local and regional boondoggles got together and petitioned Congress to create this full route as a national priority "corridor." The new I-69 is planned to go through southern Indiana, Kentucky, Tennessee, Mississippi, Arkansas, Louisiana and Texas. The southern Indiana section is probably closest to being built.

The 1998 "TEA-21" and 2005 "SAFETEA-LU" laws expanded from the few dozen new "corridors" in the 1991 ISTEA law and the 2005 law has a total of 80 corridors. Some of these

P-090-021

corridors involve upgrading existing highways, some involve construction on "new alignment," a couple of the corridor designations specify numerous road projects in a region.

The planning for NAFTA Superhighways is predicated on continued cheap and abundant gasoline -- an assumption about to receive sobering reality from the underlying geological limits of petroleum production. NAFTA Superhighways are essentially a key component of further "globalization" of commodity production intended to homogenize local communities and further centralize control over manufacturing.

None of the national environmental groups who claim to be concerned about global warming, energy efficiency and public transportation have campaigned against passage of these NAFTA superhighway laws. Some of these groups even supported their passage since a minority of the bill included public transit funding and a few pennies (relatively speaking) for bicycle and pedestrian projects.



1991 ISTEA "priority corridors" - upgrading I-5 from Canada to Mexico is included

This is the bill that some environmental groups considered a great victory for the environment since there were some small improvements for transportation planning requirements (all State DOTs now need a pedestrian / bicycle coordiator, there are new requirements for metropolitan planning for new roads, etc.). However, the bulk of this transportation law was to fund more highways.

P-090-021



from the 2005 "SAFETEA-LU" transportation law

the High Priority Corridors map was copied from the Federal Highway Administration website at www.fhwa.dot.gov/planning/nhs/hipricorridors/index.html

Corridors of the Future program includes CRC and upgrading I-5 in California

The FHWA "Corridors of the Future" program is a new corollary to the NAFTA Superhighway proposals. Some of the "corridors of the future" would include major expansions of east-west highways (especially near Chicago) that would interconnect the north south new / expanded superhighways.

P-090-021



www.fightgridlocknow.gov
www.corridors.dot.gov

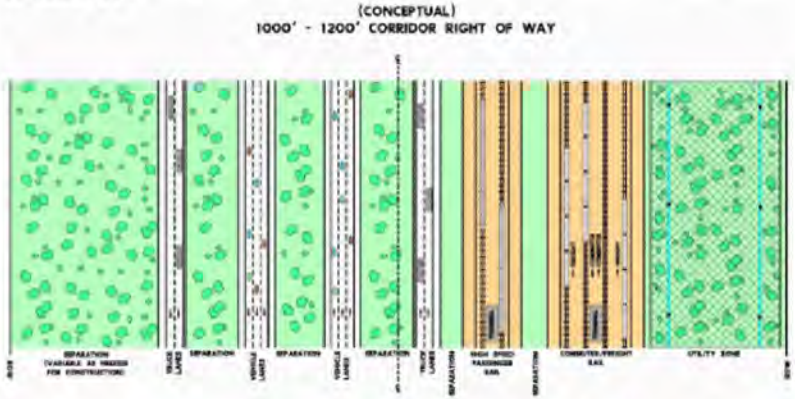
The new I-69 NAFTA Superhighway is one of the selected "corridors" for national prioritization.

Upgrading I-5 between Canada and Mexico is also a "corridor of the future," although they don't like to use the term NAFTA Superhighway even though I-5 connects Canada, the US and Mexico.



source: www.fina-nafi.org/eng/integ/corridors.asp?langue=eng&menu=integ

P-090-021 The biggest part of the NAFTA Superhighway is the Trans Texas Corridor project, a series of planned super highways without parallel (yes, they are bigger in Texas). It would include freeways for cars, truck only lanes, freight and passenger rail lines, and utilities - power lines, water pipes, oil and gas pipelines. It is a prototype of several other "corridors" around the country, including the Washington Commerce Corridor planned between Vancouver, WA and Vancouver, B.C.



Trans Texas Corridor cross section - the model for the "NAFTA Superhighways"

www.truthbetolled.com
movie about the planned Trans Texas Corridor superhighways (in opposition)

http://dfazack.typepad.com/truth_be_tolled/
blog for "Truth Be Tolled"

www.corridorwatch.org

http://corridornews.blogspot.com
The Trans-Texas Corridors, eminent domain abuse, and the Texas Toll Road Rebellion

http://transtexascorridor.blogspot.com

www.keeptexasmoving.com (pro-TTC)

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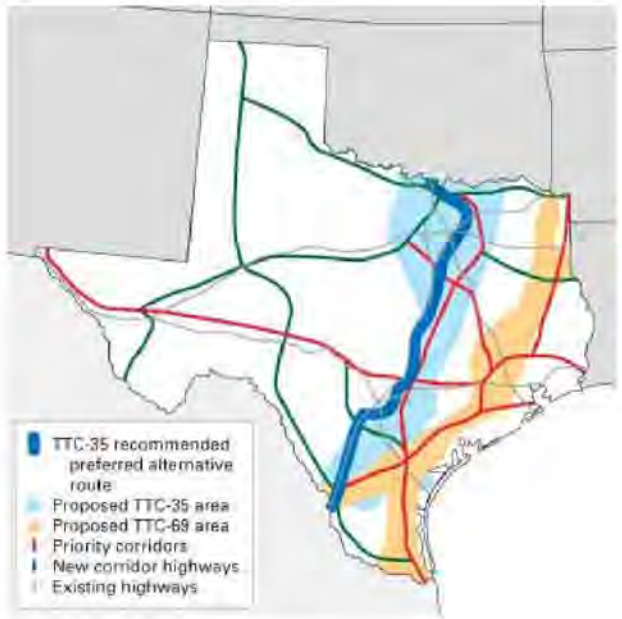

www.aaroads.com/high-priority/corr18.html
excerpt:

the concept of Interstate 69 as a "NAFTA Highway" was conceived by Indiana officials who really wanted the Interstate 69 southwestern extension. To get federal funding, they planned a multi-state routing that would cut through Kentucky, Tennessee, Mississippi, Arkansas, Louisiana, and Texas on its way to Mexico. By marketing the whole "NAFTA Corridor" concept, officials and businessmen in Indiana were able to get federal money behind the project. Of course, money was also secured for the Indiana section.

www.peakoilblues.com/blog/?p=77
Get Your Kicks on Route 6-6-6

I think of a world where fuel is so expensive, and products are so costly to move, that one needs a permit to enter that NAFTA Transnational Superhighway. I imagine that without paying someone off, it will be impossible to get that permit. Wal-Mart gets one. Dole will be cruising it too. Of course Proctor and Gamble, and you can name a few dozen others. And they'll be fast freight trains and bullet trains that will carry 'approved' citizens from one place to another. There'll be fiber optic cable lines running along side to keep our communications open. Once on the highway, the limousines and huge container carriers and trains can fill-up the tank without limits, because, after all, you have a permit to be on there anyway. Along side this Superhighway, are the gas and oil pipelines, and of course, THAT's

P-090-021

why you need the permit to enter, or at least that's the excuse. Gas flows down from Canada, for as long as it lasts, and oil flows up, until the last trickle. It is paid for by Ameros, a proposed currency I never even heard of until a few days ago. Euros, Ameros, Get it?

Washington Commerce Corridor

In Washington State, the DOT has studied creating a "Washington Commerce Corridor" between Vancouver WA and Vancouver BC with car lanes, truck lanes, freight and passenger rail, and utilities (electric lines, water, oil, gas, etc). This is the same model as the Trans Texas Corridor proposals (a large network of new highways around Texas with separate facilities for cars, trucks, freight trains, passenger rail and utilities).

The SDEIS for the I-5 Columbia River Crossing needs to explain how the CRC would interface with the Washington Commerce Corridor proposal, since the WSDOT map shows they are contiguous. Would the Commerce Corridor have "independent utility" if it was approved but the CRC is not? Is the CRC a first step toward construction of the Commerce Corridor? These issues need full examination in the SDEIS.

www.wsdot.wa.gov/freight/CommerceCorridorFeasStudy.html
proposed "Washington Commerce Corridor" - giant NAFTA Superhighway style bypass from Vancouver WA to Vancouver BC

www.seattleweekly.com/news/0427/040707_news_freeway.php
July 7, 2004
Turnpike to Perdition

The idea of a 'commerce corridor,' an enormous toll highway through Western Washington, just won't die.

www.tahomaaudubon.org/ConsJune2004.html

www.climatesolutions.org/pages/eNewsbulletins/January_2003/TakeAction_WA.htm
Stop the "I-605 sprawl highway" –
Tell state to focus on real transportation priorities!

The Washington State Department of Transportation (WSDOT) and private consultants are studying the feasibility of a new north-south interstate highway, marketed as a bi-national commerce corridor between Oregon and British Columbia. The proposal for a new 450 foot-wide highway and pipeline corridor east of I-405, is a thinly veiled attempt to build the I-605 beltway – a new highway bypass around the Greater Seattle Metropolitan Area.

Neither a bi-national commerce corridor, nor a new I-605 beltway in the Central Puget Sound Region, would significantly reduce traffic congestion, but both would lead to urban sprawl and destroy farms, forests, and habitat. Further study and funding for I-605 is a waste of valuable time and money that should instead be used to address urgent transportation priorities.

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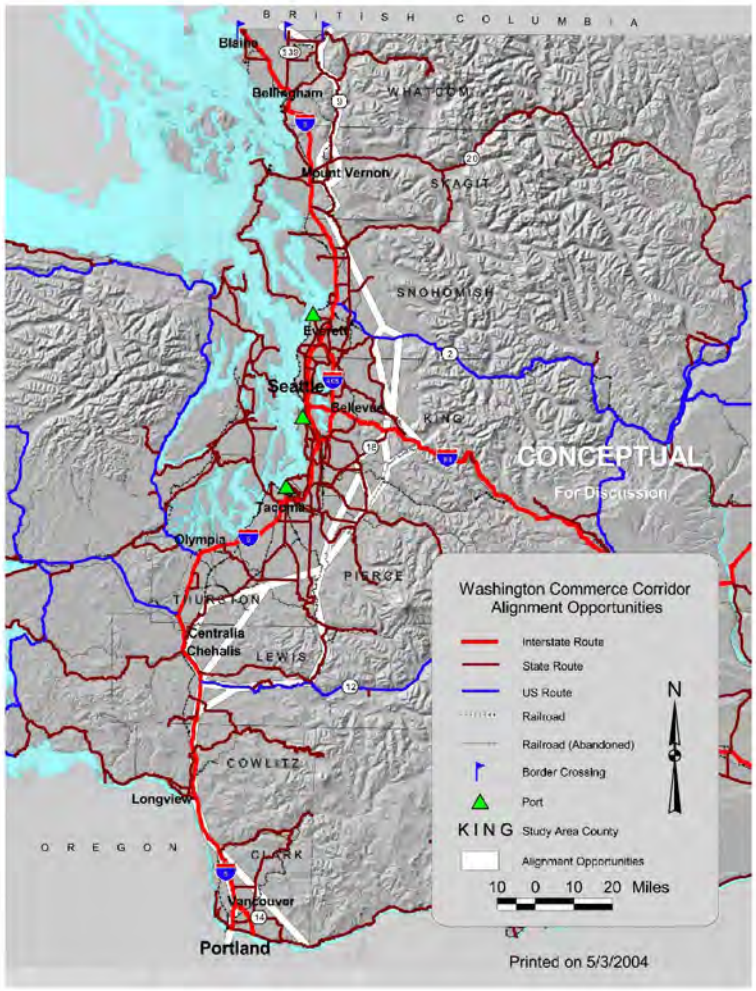
B R I T I S H C O L U M B I A
Blaine
Bellingham
WHATCOM
Mount Vernon
SKAGIT
SNOHOMISH
Everett
Seattle
Bellevue
KING
CONCEPTUAL
For Discussion
Tacoma
Olympia
PIERCE
THURSTON
Centralia
Chehalis
LEWIS
COWLITZ
Longview
O R E G O N
CLARK
Vancouver
Portland
Washington Commerce Corridor
Alignment Opportunities
Interstate Route
State Route
US Route
Railroad
Railroad (Abandoned)
Border Crossing
Port
KING Study Area County
Alignment Opportunities
10 0 10 20 Miles
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Printed on 5/3/2004

P-090-022

Tolling without tollbooths: the J. Edgar Hoover Memorial Bridge

I oppose the surveillance system to track everyone's tolls. I would support instead paying for transportation projects through the gasoline tax - those who drive more, those who drive less efficiently would pay more. Pay for the transit component of this project with gasoline taxes, and you'll make more of a dent on the transportation congestion than putting up cameras to record everyone's license plate so that the voyeurs who want to know where everyone is all of the time can spy on the entire population.

The tolling system would charge someone driving a hummer the same as someone driving a hybrid. Gasoline taxes would shift the burden to those driving less efficiently, whether driving a fuel inefficient vehicle, speeding at 70 mph (versus 55) or otherwise driving aggressively in ways that increase fuel consumption.

P-090-023

Coalition for a Livable Future "Climate Smart" Alternative

The Coalition for a Livable Future has proposed a "Climate Smart" alternative. Part of this alternative is worthy of support, part of it is not. Their proposal would build the light rail bridge, but would also establish the surveillance system on the existing bridge.

The Coalition's CRC alternatives reports ignore Peak Oil / Peak Traffic as a reason not to build a 12 lane highway bridge and lack any awareness of the civil liberties implications of the tolling scheme that you support. Climate change is a reason not to build this, but unfortunately there doesn't seem to be any legal hooks to use rising pollution levels to stop the bridge - since EIS's merely require disclosure of impacts, not their prevention. The reality of Peak Oil, on the other hand, can alter the traffic planning analyses used to justify these sorts of boondoggles, since in 2030 we will be lucky if we will be allowed to buy oil for personal consumption. Whatever the price and availability in 2030 turns out to be, it clearly will be considerable more expensive and less available two decades in the future. The CRC project needs a Supplemental Draft EIS to redo their analysis to reflect the reality of Peak Oil and Peak Traffic -- phenomena that are not going to be substantially shifted even if we had a crash program to build hybrid cars and banned SUVs (since we've waited too long to start the transition). Peak Traffic is the Achilles Heel of highway expansion proposals, and could be used to establish a precedent in federal court that would require a shift toward maintenance and transit projects (where are the environmental groups promoting Amtrak upgrades?).

We are not going to have a "livable future" if there's not much demand from environmental groups for ecological, socially just approaches to coping with the end of cheap oil as we navigate the downslope of Hubbert's Peak. Improving transit systems is nice, but only a tiny part of what would need to be done - food is likely to be a more serious problem than the obstacles to personal transportation.

Instead of an electronic toll that gives the Department of Fatherland Security a database of everyone's travels, taxing gasoline at the pump is more equitable since it charges for all trips, rewards those who drive the speed limit (speeding wastes fuel), encourages more efficient cars (tolls tax Hummers and Hybrids the same). A gas tax coupled with rebates for the poor would be

P-090-022

Please see response to P-090-001.

P-090-023

Mr. Robinowitz makes a number of interesting points in this part of his letter but does not appear to raise any specific, substantive disagreements with the FEIS that are not already responded to in the above comments.

P-090-023

the ideal solution, one that the Democratic Party probably wouldn't support but this doesn't mean the environmental groups have to support their myopia. Merely having a toll would penalize the poor since the wealthy aren't going to be substantially impacted by paying a couple bucks to cross the bridge every day.

Some of the literature from the CRC opponents even suggests the need for a a "carbon neutral" river crossing. However, the only "carbon neutral" alternative would be swimming or perhaps paddling a canoe (if the canoe was made from locally available materials and did not involve any fossil fuels in its manufacture). Even the light rail (which I support) would not be so-called "carbon neutral" since a lot of coal and some natural gas is burned for Portland's electricity.

If the light rail fuels a lot more construction in Vancouver WA (doubtful given the economic contraction that is now unfolding) then it could lead to an increase in car traffic (since only some of the new workers or residents would use the rail system). Building with concrete and steel uses lots of fossil fuels and minerals -- something to consider given we are past the point of "overshoot." Smart growth would have been a good idea in 1950, but now it is too little, too late.

It's worth remembering Martin Luther King's objections to highways, made the week before the federal government stopped his campaigning for justice:

"These forty million [poor] people are invisible because America is so affluent, so rich; because our expressways carry us away from the ghetto, we don't see the poor."
-- Martin Luther King, "Remaining Awake Through a Great Revolution," March 31, 1968

The Coalition for a Livable Future includes David Evans and Associates on their board even though they are one of the main ODOT contractors for new highway construction in Oregon. DEA is a key contractor for the Columbia River Crossing and the Sunrise Freeway in Clackamas County, among other road projects. It seems like a conflict of interest even if David Evans and Associates has some staff who do non-highway projects (light rail, perhaps?).

www.clfuture.org/about/staff-board/document_view
Jo Ann Bowman, Member at Large
Sam Chase, Community Development Network
Amanda Fritz, Friends of Arnold Creek
Lisa Gramp, Member at Large
Felisa Hagins, SEIU Local 49
Mike Houck, Urban Greenspaces Institute
Mary Kyle McCurdy, 1000 Friends of Oregon
Marcy McInelly, American Institute of Architects
Martha McLennan, Northwest Housing Alternatives
John Mullin, Social Services of Clackamas County Inc.
Marcus Mundy, Urban League of Portland
Kelly Rodgers, **David Evans and Associates**
Bob Sallinger, Audubon Society of Portland
Lara Skinner, Member at large

P-090-024

Reviving the Rails: a best case Peak Oil scenario

"In the United States, we have a railroad system that the Bulgarians would be ashamed of. We desperately are going to need railroad transport for moving people around, for moving goods around – we don't have that. What we do have is a trucking system that is going to become increasingly dysfunctional, especially as the expense mounts of maintaining the tremendous interstate highway system. It costs so much money every year to maintain what the engineers call a high level of service – which means that the trucks that are delivering things from the central valley of California to Toronto don't break their axles while they're bringing those Caesar salads to Toronto. Once you have a certain number of trucks that are breaking their axles in that 3,000 mile journey, that's the end of transcontinental trucking – which also implies that this is the end of certain economic relationships that we have gotten used to."
-- author James Howard Kunstler, from an interview in the film "The End of Suburbia: Oil Depletion and the End of the American Dream"

It is serious time to look at the nationalization of America's critical infrastructure industries: oil, gas, electricity, and others that have gouged the American consumer and now deserve to lose their windfall profits in a nationalization effort that will return to them ten cents on the dollar, if they are lucky.
- Wayne Madsen Report, April 25, 2006

In the 1960s, the success of freeway fighters in stopping the Boston Inner Belt spurred Congress to change transportation laws to allow money programmed for Interstate highways to be used for public transit. Several rail systems were created from unused freeway funds, most notably the initial construction phase of the Washington, D.C. Metro.

If the United States ever makes shifts to have an ecological, socially just policy to cope with Peak Oil, it would need to shift money from the NAFTA superhighway program to a serious revival of inter-city rail to efficiently move people and goods with less energy consumption.

A best case scenario for mitigating Peak Oil could include

- bullet train service between cities (with solar panels lining the tracks to provide some of the power),
- light rail and better bus service on major roads,
- major investments in renewable energy and hyper-conservation,
- land use shifts to reduce commuting distances,
- widespread suburban agriculture to convert lawns into food production (which would reduce truck deliveries),
- other steps to reduce our demand for oil, coal, natural gas, uranium, concrete, and mineral ores.

If we continue on the current road of overshoot, the likely consequence will be a "national Katrina" disaster, where a small group would still have access to fuels, capital, and quality food while a much larger underclass would be left to scramble for survival. But that dismal potential shares one outcome with the "positive scenario" -- both the cooperative, conservation future and

P-090-024

Please see response to P-090-001.

P-090-024

the collapse scenario would greatly reduce need for more highways. Whether we cope with Peak Oil and climate change or continue to ignore the problems until they become catastrophic and un-mitigable, there is no need to continue to expand highway network.

Relocalizing production and building renewable energy systems is a bigger priority for using the remaining oil than more freeways for Wal-Mart delivery trucks.

Future generations will regret that essential farmland was paved over - not that one more dumb highway was not built.

Politicians who have nothing practical for the public to mitigate the consequences of Peak Oil risk being thrown out of office once the price of gas goes up and stays up. Who will get the blame for ignoring the issue?

The most important question regarding planning for 2030 is what type of economy we will have after the cheap abundant oil is replaced by expensive, scarce oil. Will we use the remaining oil to relocalize production and build lots of renewable energy equipment or will this oil be used to build more freeways and fuel a futile World War to control the remaining oil fields? The answers to these questions determine the future of the human race.



This map shows a proposal from US Department of Transportation for high speed rail in the United States. Note that the Cascadia high speed train service has languished in obscurity, unfunded, ignored by politicians proclaiming themselves to be green and interested in "sustain a bull" transportation. While Washington State is making some modest upgrades to the train line -- which will provide some slightly faster Amtrak service -- the State of Oregon is doing its best to ignore problems of Willamette Valley train service.

The ODOT report "I-5 Rail Capacity Study" (February 2003), archived at www.oregon.gov/ODOT/RAIL/docs/railcapstudy.pdf estimated it would cost about $170 million to make substantial fixes to the freight rail network in the Portland area to permit increased passenger train service and unclog freight train congestion (partially caused by the import of cheap crap from China into western ports in Portland, Seattle, Tacoma and other locations).

P-090-024

The SDEIS needs to consider increased Amtrak service from Vancouver, Washington to Union Station in downtown Portland as part of the transportation mix.



Amtrak: old and new (80 and 120 mph theoretical speeds if the tracks were fixed). The Amtrak Cascades could connect cities much quicker if the tracks were upgraded to accommodate the speed it is capable of.

A side issue: solar photovoltaic panels should be installed along the tracks of the light rail, along I-5, and even along the freight rail routes where possible. This is done in a growing number of European communities, since the right of way is already cleared (and usually in public ownership). Perhaps solar panels could be used to create a roof over the bike path on the future light rail CRC bridge to keep bicyclists and pedestrians dry during the rainy season.

P-090-024



ACELA: Amtrak's high speed service from Washington, D.C. to Boston (150 mph). It is not quite the same quality of service as found in Japan, France, Germany, the Eurotunnel, Taiwan, Korea and other places with dedicated high speed routes, but it is the best train route in North America. How many high speed routes could be built for the cost of a new Trident submarine, more Stealth bombers or other Weapons of Mass Destruction that are Made in the USA? Unfortunately, even if there was a national shift in priorities to build super trains, the locomotives would have to be imported since there is almost no domestic train production capacity after decades of deliberate neglect. (The Amtrak Cascades train was built in Spain, not Puget Sound or the Willamette Valley.)

P-090-024

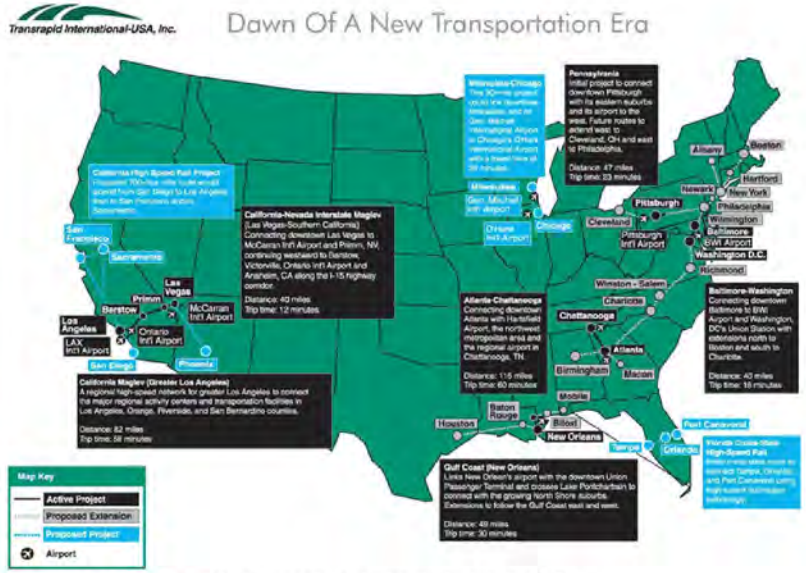
Transrapid 08

Transrapid International



Maglev: 220 to 300 mph - German test track

P-090-024



proposed pilot projects for magnetic levitation trains in the U.S.

P-090-025

Rebuttal of DEIS energy sections

3.12 Energy

Policies at the federal, state and local levels support energy conservation for all sectors, including transportation. Transportation energy efficiency is largely regulated though requirements on vehicle manufacturers rather than transportation infrastructure. There are no established standards to determine when a transportation project has an energy "impact." This DEIS compares the relative energy demands of the different CRC alternatives and discusses options that could reduce energy consumption during project construction and operations. This information is based on the CRC Energy Technical Report.

3.12.1 Existing Conditions

This section gives an overview of national and state energy supply and demand, with a focus on transportation demand and on petroleum—the primary energy source for transportation.

National Energy Demand

At the national level, industrial uses had the highest share of energy demand in 2005. **However, the transportation sector's energy demand is expected to grow by 1.4 percent annually—to a 29.9 percent share by 2030—and will exceed the industrial sector's demand. Of the total energy projected to be used by transportation in 2030, 97.4 percent is expected to come from liquid fuels and other petroleum products.** Even

note: in other words, transportation is going to remain very dependent on liquid fuels. Petroleum has the highest energy density of any known liquid fuels and has the greatest Energy Return on Energy Invested (EROEI) of any known liquid fuels.

with improvements in fuel consumption rates and increasing use of alternative fuel sources, **the high passenger travel demand and increasing use of trucks for freight is expected to result in a substantial increase in energy demand.** The transportation sector (including aviation, marine,

note: this alleged increase in demand is unlikely to be met with a parallel increase in supply. Just because there is a demand does not mean that oil fields can be extracted faster.

freight rail and roads) accounts for about 68 percent of our nation's petroleum consumption.

Washington and Oregon Energy Demand

The total demand for all energy sources in Washington State has grown steadily, although the per capita consumption rate has declined several times since the early 1970s. The demand for energy from coal and natural gas in Oregon and Washington is substantially lower than the

36

P-090-025

Please see response to P-090-001.

P-090-025

national average, but is offset by the demand for hydro-electric power. Washington is the leading hydroelectric power producer in the nation. However, as of 2004, energy derived from petroleum products accounted for the largest single share (42.0 percent) of energy consumed in Washington, slightly higher than the 2005 national demand of 40.5 percent. **In 2000, approximately 47 percent of Oregon's energy consumption came from petroleum.** Since then, petroleum's share of

note: this shows that Oregon's transportation system is totally dependent on petroleum (since the non petroleum energy supplies generally run the electric power grid, not transportation

total demand has decreased, but still accounts for the largest share of energy consumption at 35.7 percent, notably lower than the national average. As illustrated in Exhibit 3.12-1, the transportation sectors in Washington and Oregon (including aviation, marine, freight rail and roads) account for about 71 percent and 82 percent, respectively, of each state's total petroleum consumption. In Washington, state-wide petroleum demand in the industrial sector is nearly four times that of Oregon, increasing Washington's non-transportation use of petroleum.

COLUMBIA RIVER CROSSING
3-318 CHAPTER 3 ENERGY

Peak Oil and Global Supply and Demand

Peak oil refers to the time frame in which the maximum global petroleum production rate is reached, after which the rate of production enters a terminal decline. Peak oil and its relevance to the CRC project is discussed in the Cumulative Impacts section.

The trend toward more fuel-efficient vehicles is expected to continue in the future because of recent government requirements for higher fuel efficiency standards and rising petroleum prices. Promoting alternative fuel sources for transportation, such as ethanol, biodiesel, compressed natural gas, liquefied petroleum gas, and electricity has also been increasing. Nonetheless, petroleum demand in Washington, Oregon and the project area is projected to increase.

Washington and Oregon Petroleum Supply

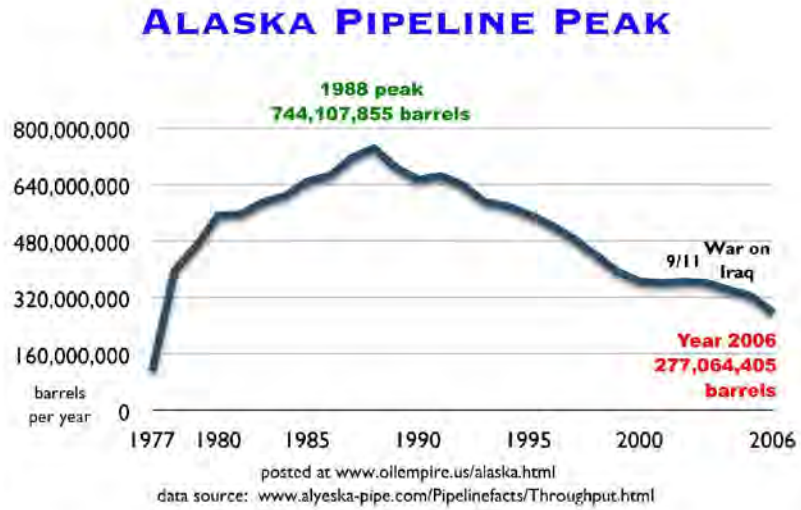
Because gasoline and diesel are the primary energy sources for the transportation sector, the analysis of energy supply focuses on petroleum-based fuel sources. **Approximately 90 percent of Washington's current supply of crude oil comes from the Alaska North Slope**. Five refineries in the Puget Sound area distribute refined

37

P-090-025

petroleum products to Washington and adjacent states. **Oregon imports 100 percent of its petroleum, of which approximately 90 percent comes from Washington refineries. Both states' future supply of petroleum is largely dependent on domestic production and reserves. Oil production from the North Slope peaked in 1988 and is projected to continue declining.**

note: In other words, Oregon and Washington are totally dependent on outside sources for oil, and the main source of that oil has been in decline for two decades -- down by two-thirds since the peak.



Energy Use in the CRC Project Area

The estimated existing daily energy use for the regional transit system (including the regional MAX light rail system and all of C-TRAN's and TriMet's buses and other transit vehicles) is approximately 2.8 x 10_9 Btus. For cars and trucks crossing the river on I-5 and I-205, the estimated daily energy use is about 1.3 x 10_9 Btus. The estimate for existing and future highway energy use is based only on the crossing portion of highway trips. It does not estimate regional highway energy demand or even project wide demand. The reason for setting these boundaries for the highway energy estimates is twofold. First, the impact on highway energy demand outside the corridor would be minimal. Second, **highway speeds and congestion have a strong influence on fuel efficiency and thus energy demand. Traffic analysis completed for the**

38

P-090-025

CRC project provides reliable speed and congestion estimates for the river crossing, but not elsewhere in the region. For these two reasons,

rebuttal: Neither Oregon nor Washington is planning to reduce highway speed limits to the Nixon era 55 mph to reduce energy consumption (although when the oil crunch becomes more obvious this decision may become inevitable). While idling cars do waste oil, cars traveling 55 mph also use lots of oil, and the impacts of "induced traffic" and induced sprawl development from new highway construction / expansion need to be factored in to these analyses. It is incorrect to suggest that a bigger bridge will reduce energy consumption - the excessive construction would be very energy intensive and the plans for extra traffic versus a Peak Traffic Alternative would consume vast oceans of fuel.

highway-related energy demand is based on the estimated traffic volumes, vehicle types and travel speeds for the crossings themselves. This captures the most meaningful effects and provides a reliable comparison among alternatives, even though it does not capture all of the potential highway energy savings.
The analysis of transit-related energy demand looks more broadly, primarily because this allows the analysis to capture the effect that the CRC alternatives have on transit operations outside the immediate project area.

3.12.2 Long-Term Effects of Project Alternatives

By 2030, energy consumption by vehicles on regional roadways, including I-5 and I-205, will increase substantially over existing conditions. This will occur largely because population growth will increase the number of cars, trucks, and buses on the road. At the same time, average vehicle fuel efficiency is expected to improve as new,

more fuel efficient and alternative fuel vehicles replace old ones.

rebuttal: It is not physically possible on the downslope of oil extraction for future consumption to be greater than the peak of production. While fuel efficiency may increase, the overall availability of energy will decline faster than federal mandates to force higher mileage standards. Alternative fuels that are under consideration have substantially lower "energy return on energy invested," so they will not be able to replace existing use of oil.

Exhibit 3.12-2 shows predicted fuel consumption in the year 2030. Highway energy use is projected to decrease for all of the build alternatives compared to the No-Build Alternative. Highway-related energy savings would likely be greater than shown as this table indicates only the energy reductions associated with the actual river crossing. The lower energy demand for the highway crossing is due to three primary factors:

• Increased I-5 bridge capacity decreases the duration of congestion

P-090-025

and increases average speeds. This improves fuel efficiency. Compared to stop and go traffic, fuel efficiency improves as average speeds increase, until the speeds reach free flow conditions.

rebuttal: Peak Traffic means that before 2030, substantial reductions in traffic flow are a certainty, thus removing the alleged "need" for highway widening across the river. Instead, extra effort should be made for expanded light rail, carpooling, world-class Amtrak service, better bus service, and other initiatives to help citizens cope with the end of cheap oil.

• CRC provides high-capacity transit that is expected to divert a portion of personal vehicular travel demand to transit, which uses less energy per passenger.
• Tolling the I-5 crossing is expected to deter some trips across the river, which reduces energy demand.

rebuttal: a more equitable means to raise the funds would be to tax gasoline at the pump, preferably at the same level on each side of the state border. Refunds could be pro-rated to lower income people to prevent an apartheid transportation system based on class. Forcing poorer people onto the new light rail train while richer people continue to drive is a form of environmental injustice.

Total energy use would rise with Alternatives 4 and 5 primarily due to the increased level of transit operations. Total energy use would decline with Alternatives 2 and 3 compared to the No-Build Alternative.
Alternative 1: No-Build
Exhibit 3.12-2
Future 2030 Energy Consumption (Million Btu)
Alternative 1
No Build
I-5 crossing 793.6
I-205 crossing 831.7
Highway Crossing Subtotal 1625.3
Conventional bus 3,238.1
Biodiesel bus[a] 0
Light rail 520.8
Transit Subtotal 3758.9
Total 5384.2
Source: CRC Energy Technical Report.
a Both transit operators have commitments to biodiesel utilization, and have begun investing in biodiesel vehicles. But for the No-Build analysis, no assumptions were made about the percentage of the vehicle fleets that may one day run on biodiesel. There is similar support for diesel/electric hybrid vehicles, though no assumptions for such were made in this analysis
The No-Build Alternative is projected to have higher energy consumption than Alternatives 2 or 3 (by about 3 percent), and lower than Alternatives 4 and 5 (by about 6 percent).

P-090-025

rebuttal: it is physically impossible for any alternative proposed today for the year 2030 to have an increase in energy consumption since the energy to be consumed is non-existent. Peak Oil will force a reduction in overall consumption regardless of government plans in Environmental Impact Statements. A Supplemental Draft EIS is needed to accurately project energy supplies in the design year of 2030.

3.12.3 Long-term Effects of Project Components

This section describes impacts of the components that comprise the project alternatives.

Multimodal River Crossing and Highway Improvements (Replacement Crossing with Alternatives 2 and 3; Supplemental Crossing with Alternatives 4 and 5)

The highway improvements associated with the replacement crossing would reduce energy demand relative to the highway improvements associated with the supplemental crossing because the additional capacity would decrease the amount of time cars spend in stop and go traffic. This improves fuel efficiency.

Transit Mode (BRT with Alternatives 2 and 4; LRT with Alternatives 3 and 5)

Light rail would reduce energy demand relative to bus rapid transit, although the difference is minor. Both modes would reduce energy demand compared to providing no high-capacity transit system in the CRC corridor.

The additional electrical energy consumed by daily operations of maintenance bases would be negligible compared to the energy consumed for transportation. Expanding either the bus maintenance base in east Vancouver or the light rail maintenance base in Gresham would not measurably affect long-term energy use.

Transit Terminus and Alignment Options (with all Alternatives)

The Lincoln terminus would use slightly less energy than the Kiggins Bowl terminus, because it is a more direct and shorter route to North Vancouver.

The transit component of full-length terminus options would consume more energy than the transit components of either of the minimum operable segment (MOS) terminus. The Clark College MOS would require approximately 1.4 percent less energy. The Mill Plain MOS, which represents the shortest high-capacity transit line length, would have the lowest energy use by approximately 2.4 percent compared to a full-length terminus. Construction energy demand would be lower for the minimum operable segments.

The transit alignment options would not affect the overall energy demand of the project, as summarized above for the alternatives.

Transit Operations

Increased transit operations (service frequency) would increase the

P-090-025

transit operational energy demand compared to the Efficient operations option. While the Increased transit operations would result in fewer autos crossing the river, and thus some reduction in highway energy demand, that decrease is not proportional to the added energy demand from the substantial increase in transit service associated with the Increased versus Efficient transit operations.

Tolling Scenarios

Tolls on the I-5 crossing are included in all build alternatives. Other tolling scenarios were studied to analyze how tolling would affect demand on the roadway.

Under tolled scenarios, the replacement crossing would result in 178,000 daily vehicle trips across the I-5 bridges and 213,000 vehicle trips across the I-205 bridges. If no toll were collected in 2030, the I-5 crossing's daily traffic levels would increase by 32,000 vehicles (18 percent). I-205's daily traffic would decrease by 13,000 vehicles (6 percent). Without tolling, an additional 19,000 (5 percent) cross-river vehicle trips would be made in 2030.

rebuttal: It is impossible for traffic levels to increase when overall energy supplies will be substantially lower in 2030 than today in 2008. A Supplemental DEIS is needed to model a Peak Traffic Alternative.

Due to the supplemental bridge's assumed higher toll, less available highway capacity, and provision of an enhanced transit system, daily I-5 vehicle crossings would be 13,000 vehicles per day lower compared to the replacement bridge, while I-205's crossings would increase by 6,000 vehicles per day. Overall, there would be 7,000 fewer vehicle crossings of the Columbia River via I-5 and I-205.

The No Toll scenario would have the highest daily energy use. Compared to the No Toll scenario, the Standard Toll on I-5 scenario would consume approximately 1.9 percent less and the Standard Toll on

COLUMBIA RIVER CROSSING

3-324 CHAPTER 3 ENERGY

Estimating Construction Energy Use

The approach for estimating energy use during construction is based on a method developed by the California Department of Transportation. It estimates energy requirements for a variety of construction activities (building structures, electrical substations, site grading, etc.) by relating project costs to the amount of energy

P-090-025

needed to manufacture, process, and install construction materials and structures.

Both I-5 and I-205 would require approximately 3.6 percent less operational energy.

3.12.4 Temporary Effects

The method used to estimate energy use from construction is based on applying a factor to construction cost estimates. This provides a straightforward albeit relatively simplistic approach for comparing the relative energy demand of alternatives.

Based on this estimating method, Alternative 3 (replacement crossing with light rail) would require the most energy to construct (estimated at about 7.28 x 10_{12} Btus), followed by Alternative 2 (3.2 percent lower), Alternative 5 (about 19.7 percent lower), and Alternative 4 (about 23.3 percent lower). Energy to construct Alternative 4, the lowest-cost full alternative, is estimated at about 5.90 x 10_{12} Btus. The two minimum operable segments are shorter and less expensive to build, and would thus require less construction energy.

For the components that make up the alternatives, light rail construction would consume more energy than bus rapid transit; and, constructing the Kiggins Bowl terminus (A) would use more energy than the Lincoln terminus (B).

3.12.5 Potential Mitigation

Potential Mitigation for Temporary Effects

A variety of potential measures could reduce energy consumption from construction. As the project advances in design, and more detail is available on construction needs and activities, additional analysis will help identify specific measures and approaches for reducing energy consumption during construction. Potential measures include:

- Construction materials reuse and recycling.
- **Encouraging workers to carpool.**

The SDEIS should consider encouraging all workers to carpool, not merely those working on the construction of the CRC.

- Turning off equipment when not in use to reduce energy consumed during idling.
- Maintaining equipment in good working order to maximize fuel efficiency.
- As practical, routing truck traffic through areas where the number of stops and delay would be minimized, and using off-peak travel times to maximize fuel efficiency.
- As practical, scheduling construction activities during daytime hours or during summer months when daylight hours are the longest to

P-090-025

3.19.11 Energy and Peak Oil

Cumulative effects related to energy use are partially incorporated into the long-term energy demand estimates prepared for the CRC project. Those estimates are based on travel demand forecasts that factor in

59 Hamlet and Lettenmaier, 1999.

60 Enertech Consultants, 1998.

COLUMBIA RIVER CROSSING

3-438 CHAPTER 3 CUMULATIVE EFFECTS

projected local changes in land use patterns, employment, population growth, and other programmed transportation improvements.

The cumulative energy impact of primary concern is "peak oil." Peak oil refers to the point in time at which the maximum global petroleum production rate is reached, after which the rate of production enters a terminal decline. **Peak oil results from many incremental actions, few of which are individually important. However, the potential impact of reaching peak global petroleum production is an important consideration for projects, such as CRC, intended to address transportation needs for decades to come.**

Oil production in the United States—the world's third largest oil producing nation—reached its peak around 1970 and has been in a declining trend since then. Most estimates place peak global production occurring some time between 1990 and 2040.

rebuttal: No credible estimates ever placed peak around 1990. Even the earliest projection - from M. King Hubbert in 1956 - estimated that the global peak might be in the mid 1990s. While Hubbert's 1956 prediction that the US would peak around 1970 was accurate, he was off by a decade for the global peak since he didn't include the reduction of consumption that happened as a result of the 1973 Saudi Oil Embargo and gasoline disruptions as a result of the Iranian revolution.

Currently, in 2008, no credible scientist estimates that 2040 is the peak of global oil. The only debate among the experts who have closely examined the data is whether we are now at Peak Oil (on a temporary plateau) or whether the peak is just ahead, a couple of years in the future. Some disingenuous voices suggest that tar sands and coal to liquids should be given equal weight in this discussion even though they take nearly as much energy to produce as they contain. When fuels require more energy to produce than they contain, they cease to be sources of energy, regardless what the ostensible price is to purchase.

The SDEIS needs to factor in the best science about the state of petroleum geology and recognize that we are at - or at least near - the point of Peak Oil.

When oil production drops below oil demand, it is likely to cause petroleum prices to increase. There are uncertainties, however, regarding peak oil's timing and the availability of substitute fuels. Peak oil's effect on transportation fuel prices and travel behavior will depend largely on

44

P-090-025

when peak oil occurs and the availability of substitute fuels. Peak oil's potential effects on economic activity and travel behavior could affect the CRC project. The concern is that if substitute fuels are not readily available as petroleum supplies decrease, **the rising cost and reduced supply of petroleum could directly reduce auto and truck travel, and could result in dramatic reductions in economic activity, which, among other effects, could further reduce vehicle trips below forecasts. These vehicle trip forecasts influence the proposed size, design, and financing of transportation facilities. If fuel prices increase faster than expected, then the number of 2030 highway trips could be lower than forecasted.** However, even with relatively substantial fuel price

rebuttal: Fuel prices have already increased faster than the assumptions used in the DEIS, which projected that 100 dollars a barrel might be reached by the year 2030. A SDEIS is needed to re-calibrate the traffic models to factor in the impacts of substantially higher energy prices (oil, natural gas, coal, etc) by 2030.

increases, the future demand would still be greater than the expanded highway capacity. Because fuel costs represent only a portion of total transportation costs (which include everything from car payments, to insurance and maintenance) even large growth in fuel costs translates to a smaller growth rate in total transportation cost, which is what most directly affects travel demand in the long term.
Global oil demand is projected to grow by 37 percent by 2030, driven in large part by transportation needs;[62] local transportation energy demand is expected to grow as well, although the CRC build alternatives are projected to reduce future transportation petroleum demand compared to No-Build. At the global scale, these fuel savings will be very small but incrementally beneficial over the No-Build Alternative.

rebuttal: demand may continue to grow, but no credible geologist suggests at this point (2008) that global oil extraction can grow by 37 percent by 2030. The only debate among Peak Oil experts is whether we have already peaked worldwide, or whether there might be some extra, secret oil in Saudi oil fields and a few other locations that will delay the peak a few years (although not to 2030 under any credible scenario). The work of the Association for the Study of Peak Oil - www.peakoil.net and www.aspo-usa.org - represents the best efforts of the world's pre-eminent petroleum geologists and does not support the claim that oil flows could theoretically increase in 2030 over current levels. A more realistic analysis would show that by 2030 we are more likely to have a 37 percent REDUCTION in oil supplies, although the decline could be steeper than this.

The CRC alternatives include a number of elements that would reduce adverse impacts related to peak oil. These include:
• The bridge and highway improvements are focused on replacing or updating aging infrastructure, not on building new highway corridors

P-090-025

61 Hirsch, 2005.
62 EIA, 2006.

What does the U.S.
Department of Energy say
about peak oil?
A report by the US Department of Energy61
included the following conclusions:
• World oil peaking is going to happen, and will likely be abrupt.
• The problem is the demand for liquid fuels (growth in demand mainly from the transportation sector).
• Mitigation efforts will require substantial time.

note: The Hirsch Report stated that we would need two decades to minimize the impact. Since Peak Oil is here, now, the subtext of this report is that President Jimmy Carter was right, but the fact that his half hearted efforts were sabotaged by the financial, political and military systems suggests that we are unprepared to cope with the unfolding crisis.

• Both supply and demand will require
attention.
• More information is needed to more precisely
determine the peak time frame.
DRAFT ENVIRONMENTAL IMPACT STATEMENT
CUMULATIVE EFFECTS EXISTING CONDITIONS AND ENVIRONMENTAL
CONSEQUENCES **3-439**
Has transportation
infrastructure been able to
adapt to change?
Transportation infrastructure has proven to
be relatively adaptable. For example, the
northbound I-5 bridge over the Columbia
River was built in 1917 as a two-lane bridge
that originally carried electric trolley cars and
Model T autos (which ran on either gasoline
or ethanol). While it is now obsolete in terms
of seismic safety and traffic safety design

P-090-025

standards, it was able to periodically adapt to nearly a century of changes in transportation technology, energy policy and prices, vehicle types, and travel behavior.

rebuttal: those changes were in the direction of increased energy consumption. We now face an era of declining energy consumption, a totally new experience without precedent (save for collapses of pre-industrial civilizations such as Rome)

• They include substantial improvements to public transportation, with projected increases in transit mode share in the afternoon peak direction from 13 percent with the No-Build to as much as 21 percent with light rail transit
• They provide substantially improved facilities for non-motorized transport
• They support land use planning that seeks to control sprawl, concentrate development, and decrease auto dependency
• They include road use pricing (highway tolling)
• Because of the addition of high-capacity transit and the bridge toll, all build alternatives are projected to have lower daily I-5 river crossings than under the no-build.
• They improve highway operations at a key pinch point which improves fuel efficiency and lowers emissions.

rebuttal: Peak Traffic makes this assertion somewhat moot, since less traffic by 2030 will see reduced congestion anyway. Carpooling, increased public transit, telecommuting and other approaches will have more impact on energy consumption that pretending that doubling the width of the highway will reduce energy consumption.

• They increase highway safety which decreases collisions and congestion, further improving fuel efficiency.

rebuttal: While there may be some traffic safety issues to be mitigated with changes to road design, requiring drivers to prove they still know how to drive and to be courteous when getting a driver's license renewal would be the single most effective approach. There is no need to double the width of I-5 merely to reduce the risk of accidents, especially as Peak Traffic sets in.

Another concern is the ability of current transportation infrastructure to adapt to post-peak oil vehicles and technology. Based on the alternative fuel vehicles that are currently being researched and developed, it is highly likely that the CRC infrastructure (transit guideway, bridges,

P-090-025 **highway, and bike and pedestrian paths) will be able to accommodate foreseeable changes. Electric hybrids, electric plug-ins, and vehicles powered by bio-diesel, ethanol, or hydrogen fuel cells are being designed to operate on modern roads and highways.** The CRC transit guideway,

rebuttal: Biodiesel is a great fuel (I use it) but it is unlikely to be scaled up to completely replace petroleum based diesel. Biodiesel also must be blended with petroleum diesel when temperatures go below 40 degrees (F). Some people suggest that (genetically altered) algae may be able to generate liquid fuels in substantial quantities, but this is not yet proven and the risks of these engineered organisms escaping into the environment and causing massive pollution is not well understood.
A biomass opponent recently wrote this:

In 1992, at the Oregon State University's botany department, Professor Elaine Ingham stepped into a potential biotech Chernobyl. One of her graduate students discovered that all the wheat plants they had been growing in jars had been turned to brown mush, a result of exposure to an engineered strain of Klebsiella planticola, a common soil bacteria. The engineered K planticola was designed to be a miracle product to decompose plant stubble and debris and to break down such for fertilizers, sludge and alcohol.

Professor Ingham saw the extreme danger presented if K planticola had escaped into the wild. (1) "That would have been the end of all terrestrial plants...it would have been dispersed any time a bird moved it to another field." she noted, even as the EPA had already approved K planticola as safe and ready for deployment. The monster germ was reluctantly shelved, Ingham and her graduate student were politically removed and the incident covered up.

Hydrogen fuel cells currently lack long term viability and require extremely scarce platinum. If hydrogen can be created (and distributed on a large scale) it might have a role in mitigating the end of the oil age.

whether built for bus rapid transit or light rail, can be used by vehicles powered by a variety of fuels. The capacity of the proposed bicycle and pedestrian facilities can accommodate substantial growth in nonmotorized transportation demand. It is likely that the proposed CRC infrastructure could readily accommodate or adapt to the transition to substitute fuel vehicles, higher than projected growth in non-motorized modes, and higher growth in transit demand.
There is substantial uncertainty regarding the timing of peak oil, the future availability of substitute fuels and technology, and the effects of peak oil on transportation. It is reasonable, however, to conclude that the CRC project can be relatively prepared, at the project level, to address reasonably foreseeable impacts associated with peak oil, and to reduce the project's incremental adverse impact.

P-090-025

rebuttal: If the CRC DEIS cannot even acknowledge the substantial increases in oil prices during the preparation of this document, then claims that the project will be able to address Peak Oil are ludicrous beyond language.

Outside the purview of CRC, numerous other measures will influence the timing and impact of peak oil at the global and local scale. These other actions include national and international energy policies, international relations, fuel and transportation taxes and fees, alternative fuel and technology research and development, agricultural policy and practices, local land use regulations, and other measures.

4. Affected Environment

4.1 Introduction

Because the supply and distribution of petroleum (Washington's and Oregon's primary energy source in general, and especially for the transportation sector) is regulated and distributed at the national and state levels, the affected environment is broadly inclusive of the U.S., Washington, and Oregon. This section provides a brief and general description of:

- The existing use and demand for energy resources in the nation and region.
- The present energy use for transportation.
- The available and forecasted supply of energy.

Because gasoline and diesel are the primary energy sources for the transportation sector,
this discussion provides general information on several energy sources, but focuses on the supply and demand of energy derived from petroleum-based fuel sources. Unless specifically defined otherwise, energy use refers to energy originating from crude oil products since energy derived from these sources generally account for over 95 percent of the total energy demand for the transportation sector.

4.2 National Energy Supply and Demand

The USDOE prepares annual energy outlook reports with projections into the future (USDOE 2007a). The Annual Energy Outlook analyzes trends in energy supply and demand worldwide with linkages to projected performance of the U.S. economy and future public policy decisions. The most recent report analyzes historical energy use beginning in 1980 and provides supply and demand forecasts to 2030 (USDOE 2007a). Energy supply forecasts are largely based on international oil markets, and national energy demand projections are organized by delivered energy sources and use sectors.

4.2.1 National Energy Supply

The national supply of petroleum largely depends on international factors. The majority

P-090-025

of oil suppliers are currently at or near production capacity, with the exception of OPEC, who is the largest contributor to the international supply of petroleum. Since its inception in 1960, OPEC has historically had a substantial role in the international and U.S. petroleum supply. In general, when the world oil price is low (price often tracks supply), OPEC curtails supply, and when the price is high, OPEC increases production. **In 2030, 66 percent of the U.S. petroleum supply is expected to be imported from international oil markets including OPEC members and other countries in the Far East, Caribbean, Europe and North America (other than the U.S.). Of this 66 percent, 37 percent is expected to originate from OPEC suppliers (USDOE 2007a).**

Rebuttal: The US already gets about two-thirds of its oil supply from outside the US. Since most of the known oil in the US has already been extracted, it is obvious that by 2030 nearly all US oil consumption is likely to be bought (or stolen via military power) from other countries. The only way that the ratio of foreign oil could remain relatively constant past the global peak is to begin to use much less oil, but that would force a substantial reduction in travel demand, which in turn means that a 12 lane bridge across the Columbia River would not be needed.

Interstate 5 Columbia River Crossing
Energy Technical Report
Affected Environment
4-2 May 2008

Historically, world oil prices have varied considerably and are expected to continue to exhibit high fluctuations as a result of political instability, access restrictions, and a reassessment of OPEC producers' ability to influence prices during periods of volatility. As a result, the 2030 national supply of petroleum could vary substantially depending on world oil prices. Due to global political and economic uncertainties, **the USDOE Annual Energy Outlook world oil prices in 2030 were forecasted for three scenarios: "High Price," "Reference Price," and "Low Price" with the cost of oil at 100, 59, and 36 dollars per barrel, respectively (in 2005 dollars). In November 2006 the price of crude oil was about 60 dollars per barrel. One year later it had risen to between 90 and 100 dollars per barrel (2007 dollars). Depending on the world oil prices, the 2030 projections for petroleum imports ranged from 13.4 million barrels per day for the High Price scenario, 17.7 million barrels per day for the Reference Price, and 20.8 million barrels per day for the Low Price scenario.**

Rebuttal: The 100 dollar a barrel price was reached four months before the publication of the DEIS, not in the year 2030. Therefore, the traffic analysis for the CRC needs to be redone to factor in geological and financial reality - the end of cheap oil is here (regardless of the precise timing of Peak Oil).

The following discussions on national and local energy supply

P-090-025

and demand are based on the Reference Price world oil prices.

4.2.2 National Energy Demand

The national demand for energy will depend on trends in population, economic activity, energy prices (which are reliant on the factors affecting the national supply described above), and the adoption and implementation of technology. In general, the energy consumption per capita is expected to increase 0.3 percent annually through 2030 primarily as a result of strong economic growth (USDOE 2007a). However, the nation's economy is becoming less reliant on energy as a result of energy efficient technologies and faster growth in less energy-intensive industries.

USDOE's annual energy outlook organizes national energy demand forecasts in 2030 by delivered energy source (liquid fuels/petroleum, natural gas, coal, electricity and renewables) and use sectors (residential, commercial, industrial, and transportation). According to the USDOE, the delivered energy use from all sources is expected to increase from 100.19 quadrillion Btu in 2005 to 131.16 quadrillion Btu in 2030, equating to annual demand growth rate of 1.1 percent (USDOE 2007d). **Energy from liquid fuels and other petroleum products is expected to account for the greatest share of energy demand (approximately 40 percent) with a growth rate of approximately 1 percent.**

rebuttal: increase in petroleum based (and derived) liquid fuels are not going to be able to continue to increase on the Peak Oil downslope.

The energy demand from renewable sources is expected to have the highest growth rate (2.2 percent from biomass and 2.6 percent from other sources for a combined growth rate of 2.3 percent), but will continue to account for the smallest overall share of energy demand in 2030 (4.2 percent). Exhibit 4-1 summarizes the national demand for energy in 2005 by energy source with projections out to 2030.

P-090-026

Peak Asphalt

http://www.usatoday.com/printedition/news/20080606/1a_bottomstrip06_dom.art.htm

Oil prices seep into asphalt costs, detour road work

Repair projects are a blow to budgets
By Judy Keen
USA TODAY

P-090-026

Please see response to P-090-001.

P-090-026

CHICAGO — Fewer roads will be repaved this summer, thanks to soaring prices of oil-based asphalt.

Some states, cities and counties say their road-repair budgets didn't anticipate asphalt prices that are up 25.9% from a year ago, so they're being forced to delay projects.

"We will do what patching we can, but this will truly, truly be a devastating blow to the infrastructure," says Shirlee Leighton, a county commissioner in Lake County, S.D., where a 5-mile repaving project was postponed after bids came in $79,000-$162,000 higher than the $442,000 budget.

The mix used to resurface roads consists of gravel and sand held together with a binder called liquid asphalt, which is made from crude oil. As oil prices rise, so does the cost of asphalt, says Don Wessel of Poten & Partners, a consulting firm that publishes Asphalt Weekly Monitor. "Prices are the highest I've seen in many, many, many years," he says. "The concern is that they will go up considerably."

Increases in the cost of diesel fuel used to transport, heat and lay asphalt are adding to the sticker shock, too, creating headaches across the USA:

•Larimer County, Colo., would like to resurface 16-20 miles of its 450 miles of paved roads each year. "This year, we'll be lucky to do seven miles," says road and bridge director Dale Miller.

•Paul Degges, chief engineer for the Tennessee Department of Transportation, will resurface 1,600 miles of state highway this year, well short of his 2,500-mile target. "Since my budget is not growing and costs are up, we're doing less paving," he says.

•A few paved roads in Hall County, Neb., will revert to gravel surfaces, says public works director Casey Sherlock. "At some point, they'll be potholed so bad we won't be able to keep patching them." He had hoped to resurface 6-7 miles of road this spring and could afford only 2 miles.

•In Washington County, Md., acting deputy public works director Robert Slocum is using alternative treatments requiring less asphalt. The result: More miles are being treated with less asphalt, but "ride quality" can be compromised.

•Snohomish County, Wash., pays 17% more for asphalt than a year ago, says county engineer Owen Carter. It's pooling funds with four cities to get a better price.

•The Grand Traverse County (Mich.) Road Commission plans to bid out 30 miles of resurfacing before a bond issue of up to $4 million is finalized to lock in prices before they go even higher, Road Commission manager Mary Gillis says.

Ken Simonson, chief economist for Associated General Contractors of America, says the asphalt-price squeeze exacerbates the USA's infrastructure problems and "may force Congress and the states to find more money for roads sooner than they would have otherwise."

Page 1A

P-090-027

Spy Roads: Civil Liberties vs. Transportation Surveillance

European Parliament – Luxembourg, 6 January 1998 – Directorate General for Research
Scientific and Technological Options Assessment – An Appraisal of Technologies of Political Control
archived at http://www.cryptome.org/stoa-atpc.htm

52

P-090-027

Please see response to P-090-001.

P-090-027

Vehicle Recognition Systems

... A huge range of surveillance technologies has evolved, including the night vision goggles discussed in 3 above; parabolic microphones to detect conversations over a kilometre away (see Fig. 18); laser versions marketed by the German company PK Electronic, can pick up any conversation from a closed window in line of sight; the Danish Jai stroboscopic camera (Fig. 19) which can take hundreds of pictures in a matter of seconds and individually photograph all the participants in a demonstration or March; and the automatic vehicle recognition systems which can identify a car number plate then track the car around a city using a computerised geographic information system. (Fig.20) Such systems are now commercially available, for example, the Talon system introduced in 1994 by UK company Racal at a price of £2000 per unit. The system is trained to recognise number plates based on neural network technology developed by Cambridge Neurodynamics, and can see both night and day. Initially it has been used for traffic monitoring but its function has been adapted in recent years to cover security surveillance and has been incorporated in the "ring of steel" around London. The system can then record all the vehicles that entered or left the cordon on a particular day.

Such surveillance systems raise significant issues of accountability particularly when transferred to authoritarian regimes. The cameras ... in Tiananmen Square were sold as advanced traffic control systems by Siemens Plessey. Yet after the 1989 massacre of students, there followed a witch hunt when the authorities tortured and interrogated thousands in an effort to ferret out the subversives. The Scoot surveillance system with USA made Pelco camera were used to faithfully record the protests. the images were repeatedly broadcast over Chinese television offering a reward for information, with the result that nearly all the transgressors were identified. Again **democratic accountability is only the criterion which distinguishes a modern traffic control system from an advanced dissident capture technology.** Foreign companies are exporting traffic control systems to Lhasa in Tibet, yet Lhasa does not as yet have any traffic control problems. **The problem here may be a culpable lack of imagination.**

"that [surveillance] capability at any time could be turned around on the American people and no American would have any privacy left, such [is] the capability to monitor everything: telephone conversations, telegrams, it doesn't matter. There would be no place to hide. If this government ever became a tyranny, **if a dictator ever took charge in this country, the technological capacity that the intelligence community has given the government could enable it to impose total tyranny,** and there would be no way to fight back, because the most careful effort to combine together in resistance to the government, no matter how privately it was done, is within the reach of the government to know. Such is the capability of this technology ...

"I don't want to see this country ever go across the bridge. I know the capacity that is there to make tyranny total in America, and we must see to it that this agency [NSA] and all agencies that possess this technology operate within the law and under proper supervision, so that we never cross over that abyss. That is the abyss from which there is no return."

-- Senator Frank Church (D-Idaho), 1975, quoted in James Bamford, "The Puzzle Palace"

P-090-027

"If this were a dictatorship, it would be a heck of a lot easier, just so long as I'm the dictator."

- George W. Bush, December 18, 2000

Maryland's highway surveillance systems

www.baltimoresun.com/news/local/bal-te.md.reader03apr03,0,73671.story?coll=bal-home-headlines

Cameras scan license plates for stolen cars

By Melissa Harris

Sun reporter

Originally published April 3, 2006

As her marked car crawled through the parking lot, Detective Kelly Tibbs' new laptop beeped like a supermarket scanner. Two cameras, positioned like crab eyes on the cruiser's roof, snapped digital pictures of hundreds of license plates, and with each beep, the laptop checked the images against an FBI list of stolen cars.

Such cameras - called Mobile Plate Hunters - are replacing the laborious eyeball-and-keystroke method of checking for stolen cars, letting busy officers rely instead on an automated scan that takes less than a second.

Already in widespread use in London and Italy, automatic number plate recognition is a technology on the verge of exploding in the Baltimore-Washington area, fueled in places by funds from the federal Department of Homeland Security.

Howard and Anne Arundel counties deploy one each. Prince George's County and the District of Columbia have ordered more than a dozen of the cameras, which have been in use in Prince George's since August and the district since January.

Baltimore police are soliciting bids for a system that would work with the city's existing network of street surveillance cameras. And as early as this summer's vacation rush, Maryland Transportation Authority Police hope to add the cameras to the Bay Bridge as part of a pilot project with the U.S. Department of Justice.

Stationary cameras, such as those envisioned for Baltimore and the Bay Bridge, could alert nearby officers if an offending vehicle - one bearing a license plate registered to a wanted criminal, suspected terrorist or car thief - goes past.

"The uses are as limitless as your imagination," said Lt. John McKissick, director of Howard County's emergency preparedness division. "We're just in the infancy of this project, but already it saves us money and manpower."

Although proponents say the technology eventually will deny all but the most clever of criminals access to roads, privacy advocates warn that the plate hunters mark another step toward a society in which police can track a person's every move.

"Normally, your license plate number only becomes relevant when you're involved in an accident, pulled over by police or when your car is stolen," said Marc Rotenberg, executive director of the Electronic Privacy Information Center. "This technology changes that. ... It's a new form of surveillance."

P-090-027

The technology, which Tibbs demonstrated in the parking lot of Howard County police headquarters, was developed in Italy and used by the Italian postal service. Postcards would zip along a conveyer belt, the cameras would read them, and the computer would sort them.

"The engineers in Italy realized that if they could read Bulgarian postcards handwritten with pencil at high speeds, license plates would be a piece of cake," said Mark Windover, president of Remington-Elsag, a partnership between the U.S. gun manufacturer and the Italian postal-technology company, which sold a plate hunter to Howard County for $26,0000.

The plate hunters use infrared light to "read" as many as 900 license plates per minute zooming by at speeds of up to 120 miles per hour in the rain or dark, McKissick said.

Infrared light illuminates the plate, the camera snaps a picture and the computer converts it into digital characters - ABC 123, for example - using optical character recognition. Strapping two cameras to a roof allows the system to go through a mall parking lot, checking plates on both sides of the police car.

Each night, local police departments download FBI data to in-car laptops. When a scanned license plate matches one in the FBI database, the computer triggers an alarm, and the screen blinks red "alert" signs. Before officers can make an arrest, they must check the accuracy of the alert because the database lags a day behind, and the system does not distinguish among states.

"In one block in Washington, I recovered six sets of stolen tags and a stolen motorcycle using the reader," said state police Detective Sgt. George Jacobs, assistant commander of the Washington-area vehicle enforcement unit. "It's just amazing that there are areas out there like that. It's a great tool because manually, it would have taken me several hours to type in the tags."

Though the primary purpose of the technology is to recover stolen vehicles, Howard County and other jurisdictions plan to eventually use the cameras for surveillance.

McKissick said he envisions placing cameras around potential terrorist targets and linking them to neighboring counties' systems. For instance, if the same license plate passes emergency communications towers in Howard, Baltimore and Anne Arundel counties, the system could alert police in all three areas.

The technology also could be used to enforce laws or court orders that keep sexual predators away from schools or domestic abusers away from spouses.

Already, when Tibbs learns of an Amber Alert, she can enter the tag number manually into her laptop and search for the car. The system also is linked to the FBI's "violent gangs and terrorism organization file," though Howard County is not yet using it because the plate hunter is still new to the department, McKissick said.

"We want to be able to look at offenders with another set of eyes," said Chief Gary W. McLhinney of the Maryland Transportation Authority Police, which is working to secure a pilot program for the technology at the Bay Bridge.

McKissick and other officers dismiss concerns that the cameras invade drivers' privacy. McKissick said the machine is "strictly a numbers game," enabling officers to do more of what they already do.

Jacobs said the system does not discriminate and that the computer does not list a tag owner's information unless it sounds an alert on the car. Without the computer, officers choose which license plates they check, lacking the time to manually enter every one they see.

"There can be no discrimination," Jacobs said, "because the machine picks and runs every tag it sees."

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P-090-027 Britain's auto Panopticon

http://news.independent.co.uk/uk/transport/article334686.ece
Britain will be first country to monitor every car journey
From 2006 Britain will be the first country where every journey by every car will be monitored
By Steve Connor, Science Editor
Published: 22 December 2005

Britain is to become the first country in the world where the movements of all vehicles on the roads are recorded. A new national surveillance system will hold the records for at least two years.

Using a network of cameras that can automatically read every passing number plate, the plan is to build a huge database of vehicle movements so that the police and security services can analyse any journey a driver has made over several years.

The network will incorporate thousands of existing CCTV cameras which are being converted to read number plates automatically night and day to provide 24/7 coverage of all motorways and main roads, as well as towns, cities, ports and petrol-station forecourts.

By next March a central database installed alongside the Police National Computer in Hendon, north London, will store the details of 35 million number-plate "reads" per day. These will include time, date and precise location, with camera sites monitored by global positioning satellites.

Already there are plans to extend the database by increasing the storage period to five years and by linking thousands of additional cameras so that details of up to 100 million number plates can be fed each day into the central databank.

Senior police officers have described the surveillance network as possibly the biggest advance in the technology of crime detection and prevention since the introduction of DNA fingerprinting.

But others concerned about civil liberties will be worried that the movements of millions of law-abiding people will soon be routinely recorded and kept on a central computer database for years.

The new national data centre of vehicle movements will form the basis of a sophisticated surveillance tool that lies at the heart of an operation designed to drive criminals off the road.

In the process, the data centre will provide unrivalled opportunities to gather intelligence data on the movements and associations of organised gangs and terrorist suspects whenever they use cars, vans or motorcycles.

The scheme is being orchestrated by the Association of Chief Police Officers (Acpo) and has the full backing of ministers who have sanctioned the spending of £24m this year on equipment.

More than 50 local authorities have signed agreements to allow the police to convert thousands of existing traffic cameras so they can read number plates automatically. The data will then be transmitted to Hendon via a secure police communications network.

Chief constables are also on the verge of brokering agreements with the Highways Agency, supermarkets and petrol station owners to incorporate their own CCTV cameras into the network. In addition to cross-checking each number plate against stolen and suspect vehicles held on the Police National Computer, the national data centre will also check whether each vehicle is lawfully licensed, insured and has a valid MoT test certificate.

"Every time you make a car journey already, you'll be on CCTV somewhere. The difference is that, in future, the car's index plates will be read as well," said Frank Whiteley, Chief

P-090-027

Constable of Hertfordshire and chairman of the Acpo steering committee on automatic number plate recognition (ANPR).

"What the data centre should be able to tell you is where a vehicle was in the past and where it is now, whether it was or wasn't at a particular location, and the routes taken to and from those crime scenes. Particularly important are associated vehicles," Mr Whiteley said.

The term "associated vehicles" means analysing convoys of cars, vans or trucks to see who is driving alongside a vehicle that is already known to be of interest to the police. Criminals, for instance, will drive somewhere in a lawful vehicle, steal a car and then drive back in convoy to commit further crimes "You're not necessarily interested in the stolen vehicle. You're interested in what's moving with the stolen vehicle," Mr Whiteley explained.

According to a strategy document drawn up by Acpo, the national data centre in Hendon will be at the heart of a surveillance operation that should deny criminals the use of the roads.

"The intention is to create a comprehensive ANPR camera and reader infrastructure across the country to stop displacement of crime from area to area and to allow a comprehensive picture of vehicle movements to be captured," the Acpo strategy says.

"This development forms the basis of a 24/7 vehicle movement database that will revolutionise arrest, intelligence and crime investigation opportunities on a national basis," it says.

Mr Whiteley said MI5 will also use the database. "Clearly there are values for this in counter-terrorism," he said.

"The security services will use it for purposes that I frankly don't have access to. It's part of public protection. If the security services did not have access to this, we'd be negligent."

http://news.com.com/E-tracking,+coming+to+a+DMV+near+you/2010-1071_3-5980979.html

DECLAN MCCULLAGH, CNET, December 5, 2005

Trust federal bureaucrats to take a good idea and transform it into a frightening proposal to track Americans wherever they drive.

The U.S. Department of Transportation has been handing millions of dollars to state governments for GPS-tracking pilot projects designed to track vehicles wherever they go. So far, Washington state and Oregon have received fat federal checks to figure out how to levy these "mileage-based road user fees."

Now electronic tracking and taxing may be coming to a DMV near you. The Office of Transportation Policy Studies, part of the Federal Highway Administration, is about to announce another round of grants totaling some $11 million. A spokeswoman on Friday said the office is "shooting for the end of the year" for the announcement, and more money is expected for GPS (Global Positioning System) tracking efforts.

In principle, the idea of what bureaucrats like to call "value pricing" for cars makes sound economic sense.

No policy bans police from automatically sending out speeding tickets based on what the GPS data say.

Airlines and hotels have long charged less for off-peak use. Toll roads would be more efficient--in particular, less congested--if they could follow the same model and charge virtually nothing in the middle of the night but high prices during rush hour.

That price structure would encourage drivers to take public transportation, use alternate routes, or leave earlier or later in the day.

P-090-027

The problem, though, is that these "road user fee" systems are being designed and built in a way that strips drivers of their privacy and invites constant surveillance by police, the FBI and the Department of Homeland Security.

Zero privacy protections

Details of the tracking systems vary. But the general idea is that a small GPS device, which knows its location by receiving satellite signals, is placed inside the vehicle.

Some GPS trackers constantly communicate their location back to the state DMV, while others record the location information for later retrieval. (In the Oregon pilot project, it's beamed out wirelessly when the driver pulls into a gas station.)

The problem, though, is that no privacy protections exist. No restrictions prevent police from continually monitoring, without a court order, the whereabouts of every vehicle on the road.

No rule prohibits that massive database of GPS trails from being subpoenaed by curious divorce attorneys, or handed to insurance companies that might raise rates for someone who spent too much time at a neighborhood bar. No policy bans police from automatically sending out speeding tickets based on what the GPS data say.

The Fourth Amendment provides no protection. The U.S. Supreme Court said in two cases, U.S. v. Knotts and U.S. v. Karo, that Americans have no reasonable expectation of privacy when they're driving on a public street.

The PR offensive

Even more shocking are additional ideas that bureaucrats are hatching. A report prepared by a Transportation Department-funded program in Washington state says the GPS bugs must be made "tamper proof" and the vehicle should be disabled if the bugs are disconnected.

"This can be achieved by building in connections to the vehicle ignition circuit so that failure to receive a moving GPS signal after some default period of vehicle operation indicates attempts to defeat the GPS antenna," the report says.

It doesn't mention the worrisome scenario of someone driving a vehicle with a broken GPS bug--and an engine that suddenly quits half an hour later. But it does outline a public relations strategy (with "press releases and/or editorials" at a "very early stage") to persuade the American public that this kind of contraption would be, contrary to common sense, in their best interest.

One study prepared for the Transportation Department predicts a PR success. "Less than 7 percent of the respondents expressed concerns about recording their vehicle's movements," it says.

That whiff of victory, coupled with a windfall of new GPS-enabled tax dollars, has emboldened DMV bureaucrats. A proposal from the Oregon DMV, also funded by the Transportation Department, says that such a tracking system should be mandatory for all "newly purchased vehicles and newly registered vehicles."

The sad reality is that there are ways to perform "value pricing" for roads while preserving anonymity. You could pay cash for prepaid travel cards, like store gift cards, that would be debited when read by roadside sensors. Computer scientists have long known how to create electronic wallets--using a technique called blind signatures--that can be debited without privacy concerns.

The Transportation Department could require privacy-protective features when handing out grants for pilot projects that may eventually become mandatory. It's now even more important because a new U.S. law ups the size of the grants; the U.K. is planning GPS tracking and per-mile fees ranging between 3 cents and $2.

P-090-027

We'll see. But given the privacy hostility that the Transportation Department and state DMVs have demonstrated so far, don't be too optimistic.

http://news.com.com/2102-1071_3-5980979.html?tag=st.util.print

www.globetechnology.com/servlet/ArticleNews/TPStory/LAC/20051128/SMARTCARS28/TPTechnology/
BIG BROTHER COMING UNDER YOUR CAR HOOD

JEFF GRAY, GLOVE AND MAIL, CA- It's the last thing many motorists would want -- a permanent, electronic back-seat driver, forcefully reminding them not to speed. But Transport Canada is road-testing cutting-edge devices that use global positioning satellite technology and a digital speed-limit map to know when a driver is speeding, and to try to make them stop. When a driver hits a certain percentage above the posted speed limit, the device kicks in and makes it difficult to press the accelerator. While the idea appeals to some road-safety experts, even the researcher in charge of the project admits many drivers -- some of whom have shown fierce resistance to photo-radar and red-light cameras -- may balk at the science-fiction scenario of a machine forcing them to apply the brakes. . . In Europe, proponents have said that the technology should be mandatory in all vehicles or that insurance companies might offer discounts to drivers who use it.

BOSTON HERALD - Over the coming year, the T will install automated fare collection equipment at every subway station and on every bus, allowing riders to pay easily with taps of special smart cards in their names. But each transaction with the plastic Charlie Cards will be recorded electronically, creating a record of where users were at a particular time on a particular day. Those records could be subpoenaed by cops, courts or even lawyers in civil cases. "The bottom line is that like other developments with consumer products and technology, the convenience does have a flip side. It's convenience versus having the government be able to track you," said privacy expert Eric Gertler. . .

The new automated fare system will record where a passenger boards the system and at what time. The system won't capture any data on the rider's destination. The information will be archived for a year and a half to two years before it's erased. . .

The Massachusetts Turnpike Authority has for years recorded where and when users of the Fas tLane electronic transponders get on and off the toll highway. Unlike the MBTA, the Turnpike's privacy protections barring outside release of the data without a subpoena are written into state law. "On a fairly regular basis we receive subpoena requests both civil and criminal," Pike spokesman Tom Farmer said.
http://news.bostonherald.com/localRegional/view.bg?articleid=118780&format=text

http://news.independent.co.uk/uk/transport/story.jsp?story=644303
Satellite toll plan to make drivers pay by the mile
Darling orders nationwide road pricing. Charge of £1.34 a mile on busiest roads
By Francis Elliott, Deputy Political Editor
05 June 2005

British motorists face paying a new charge for every mile they drive in a revolutionary scheme to be introduced within two years.

P-090-027

Drivers will pay according to when and how far they travel throughout the country's road network under proposals being developed by the Government.

Alistair Darling, the Secretary of State for Transport, revealed that pilot areas will be selected in just 24 months' time as he made clear his determination to press ahead with a national road pricing scheme.

Each of Britain's 24 million vehicles would be tracked by satellite if a variable "pay-as-you-drive" charge replaces the current road tax.

In an interview with The Independent on Sunday, Mr Darling warned that unless action is taken now, the country "could face gridlock" within two decades.

Official research suggests national road pricing could increase the capacity of Britain's network by as much as 40 per cent at a stroke, he said.

The rapid uptake of satellite navigational technology in cars is helping to usher in the new "pay-as-you-drive" charge much sooner than had been expected. Figures contained in a government feasibility study have suggested motorists could pay up to £1.34 for each mile they travel during peak hours on the most congested roads.

Although a fully operational national scheme is still considered to be a decade away, Mr Darling said local schemes could be up and running within five years. Manchester is considered a front-runner, with local authorities in the Midlands and London also pressing to be considered for a £2.5bn central fund to introduce the change.

Most of the necessary technology already exists. Lorries will be tracked by satellite and charged accordingly from 2007. The main obstacle to constructing a scheme to track Britain's 24 million private vehicles is public opinion, and Mr Darling is determined to start making the case now.

"You could dance around this for years but every year the problem is getting worse," he said.

"We have got to do everything we can during the course of this Parliament to decide whether or not we go with road pricing. Something of this magnitude will span several parliaments and you need 'buy-in' not just from political parties but also from the general public.

"Drivers have got to see that they benefit," he said, adding that one of the "weaknesses" of the congestion charging scheme introduced in the capital by the Mayor of London, Ken Livingstone, was that it delivered a "general benefit not a particular benefit". Motorists could feel they are paying a penalty to support buses they do not use.

The national road-pricing scheme, by contrast, has got to work so there's "something in it for me", said Mr Darling in advance of a keynote speech on the issue this Thursday.

Despite his insistence that the scheme would lead to no overall increase in the level of taxation as road taxes and fuel duties are reduced or abolished, it is bound to prompt fresh claims that Labour is waging a "war on motorists".

Some campaigners, meanwhile, are pressing Mr Darling to introduce new levies on individual roads immediately, using existing microwave technology or tolls. But that would force traffic on to quieter roads while entrenching opposition to a national scheme, ministers believe.

However, new and expanded roads are likely to see innovations such as car-sharing lanes, available to single drivers only if they pay a premium.

Geoslavery: GPS and technological tyranny

www.ur.ku.edu/News/03N/MarchNews/March5/dobson.html
March 5, 2003
KU researcher warns against potential threat of 'geoslavery'

P-090-027

LAWRENCE -- Jerome Dobson wants to make sure his field of research doesn't aid the greatest threat to personal freedom.

As a pioneer of geographic information systems (GIS), Dobson, a researcher at the Kansas Applied Remote Sensing Program at the University of Kansas, helped develop the technology that now is commonplace in government, business and practically every aspect of modern life.

Since 1975, Dobson has used GIS for a number of applications -- from conducting environmental analyses to identifying populations at risk of terrorism and natural disasters -- by combining data sets such as detailed population counts of every country in the world, terrain and nighttime lights interpreted from satellite images, road networks and elevations. Dobson, who is a professor of geography at KU, also is president of the American Geographical Society.

Unfortunately, the same technology that has so many beneficial uses also has the potential to create a highly sophisticated form of slavery, or "geoslavery," as Dobson calls it. What worries Dobson is that GIS technology easily could be used not only to spy on people but to control them as well.

"It concerns me that something I thought was wonderful has a downside that may lead to geoslavery -- the greatest threat to freedom we've ever experienced in human history," he said.

By combining GIS technology with a global positioning system (GPS) and a radio transmitter and receiver, someone easily can monitor your movements with or without your knowledge. Add to that a transponder -- either implanted into a person or in the form of a bracelet -- that sends an electric shock any time you step out of line, and that person actually can control your movements from a distance.

Sound like something from a bad sci-fi movie? Actually, several products currently on the market make this scenario possible.

"In many ways that's what we're doing with prisoners right now, but they've been through a legal process," he said.

In fact, many of the existing products are marketed to parents as a way to protect their children from kidnappers. Dobson, however, said parents should think twice before using such products.

"A lot of people think this is a way to protect their children," he said. "But most kidnappers won't have any compunction about cutting the child to remove an implant or bracelet."

Furthermore, these products rely on wireless networks, which are notoriously easy for hackers to break into, potentially turning the very products meant to protect children into fodder for tech-savvy child predators.

Dobson outlined the dangers of geoslavery in an article that appears in the most recent issue of the Institute of Electrical and Electronics Engineers' Technology and Society magazine. Peter F. Fisher, editor of the International Journal of Geographic Information Science, co-wrote the paper with Dobson. More than 375,000 scientists read the IEEE magazine.

One of the greatest dangers of geoslavery is that it doesn't apply just to governments. For example, individuals could use the technology to perpetuate various forms of slavery, from child laborers to sex slaves to a simple case of someone controlling the whereabouts of his or her spouse, Dobson said.

"Many people have concerns today about privacy but they haven't put all the pieces together and realized this means someone can actually control them -- not just know about them, but control them," Dobson said.

As the price of these products gets cheaper and cheaper, the likelihood rises that the technology will be abused, he said. To prevent this, Dobson's paper outlines a number of actions that should be taken, including revising national and international laws on incarceration, slavery,

P-090-027

stalking and branding, and developing encryption systems that prevent criminals or countries with bad human rights records from accessing GPS signals.

Still, the first step is making people aware of the very real threat that geoslavery poses. The potential for harm is even greater in less developed nations without strong traditions of personal freedom, he said.

"We need a national dialogue on this if we're going to go into something so different from our traditional values of privacy and freedom," Dobson said. "We need to think about it very carefully and decide if this is a direction we as a society want to go."

Dobson said he doesn't consider himself a crusader. Instead, he is a scientist who is working diligently to ensure that people really understand the good and bad sides of the technology he helped create.

"There certainly are many, many good uses for the technology -- that's not the issue -- the issue is that it can be so easily misused," he said. "My role as a university professor is to alert people and make sure there is an informed debate."

http://www.smartmobs.com/archive/2003/03/12/gps_spawns_fear.html

CNN reports on Jerome Dobson's concerns that GPS technology may be hazardous to personal liberties. Dobson is president of the American Geographical Society. "Geoslavery" is a good word for describing one of the biggest downsides to smartmob technology.

http://charlotte.creativeloafing.com/2004-09-29/news_cover.html
NEWS COVER 09.29.04
Big Brother In Your Car
Futuristic hi-tech could save your life -- and raid your privacy
BY TARA SERVATIUS

Deep inside the United States Department of Transportation, Big Brother is rearing his head. On the third floor of the USDOT building in the heart of Washington, DC, a shadowy government agency that doesn't respond to public inquiries about its activities is coordinating a plan to use monitoring devices to catalogue the movements of every American driver.

Most people have probably never heard of the agency, called the Intelligent Transportation Systems Joint Program Office. And they haven't heard of its plans to add another dimension to our national road system, one that uses tracking and sensor technology to erase the lines between cars, the road and the government transportation management centers from which every aspect of transportation will be observed and managed.

For 13 years, a powerful group of car manufacturers, technology companies and government interests has fought to bring this system to life. They envision a future in which massive databases will track the comings and goings of everyone who travels by car or mass transit. The only way for people to evade the national transportation tracking system they're creating will be to travel on foot. Drive your car, and your every movement could be recorded and archived. The federal government will know the exact route you drove to work, how many times you braked along the way, the precise moment you arrived -- and that every other Tuesday you opt to ride the bus.

They'll know you're due for a transmission repair and that you've neglected to fix the ever-widening crack that resulted from a pebble dinging your windshield.

P-090-027

Once the system is brought to life, both the corporations and the government stand to reap billions in revenues. Companies plan to use the technology to sell endless user services and upgrades to drivers. For governments, tracking cars' movements means the ability to tax drivers for their driving habits, and ultimately to use a punitive tax system to control where they drive and when, a practice USDOT documents predict will be common throughout the country by 2022.

This system the government and its corporate partners are striving to create goes by many names, including the information superhighway and the Integrated Network of Transportation information, or INTI. Reams of federal documents spell out the details of how it will operate.

Despite this, it remains one of the federal government's best-kept secrets. Virtually nothing has been reported about it in the media. None of the experts at the privacy rights groups Creative Loafing talked to, including the ACLU, the Consumers Union and the Privacy Rights Clearinghouse, had ever heard of the INTI. Nor had they heard of the voluminous federal documents that spell out, in eerie futuristic tones, what data the system will collect and how it will impact drivers' daily lives.

Buried inside two key federal documents lies a chilling cookbook for a Big Brother-style transportation-monitoring system. None of the privacy experts we talked to was aware of a 2002 USDOT document called the "National Intelligent Transportation Systems Program Plan: A Ten-Year Vision" or the "National ITS Architecture ITS Vision Statement," published by the Federal Highway Administration in 2003.

What's more, no one we talked to was aware of just how far the USDOT has come in developing the base technology necessary to bring the system to life.

More than $4 billion in federal tax dollars has already been spent to lay the foundation for this system. Some of the technologies it will use to track our movements are already familiar to the public, like the GPS technology OnStar already used to pinpoint the location of its subscribers. Others are currently being developed by the USDOT and its sub-agencies.

Five technology companies hired by the USDOT to develop the transceivers, or "on-board units," that will transmit data from your car to the system are expected to unveil the first models next spring. By 2010, automakers hope to start installing them in cars. The goal is to equip 57 million vehicles by 2015.

Once the devices are installed, the technology will allow cars to talk to each other in real time, transmitting information about weather, dangerous road conditions ahead and even warning drivers instantaneously of an impending collision. When used in combination with GPS technology already being installed in millions of cars, the INTI will be able to transmit real-time information about where your car is and where you've been.

Though Joint Project Office officials refused to talk to Creative Loafing about the next step in their plan, one official defined it simply in a presentation before the National Research Council in January.

"The concept," said Bill Jones, Technical Director of the Joint Office, "is that vehicle manufacturers will install a communications device on the vehicle starting at some future date, and equipment will be installed on the nation's transportation system to allow all vehicles to communicate with the infrastructure."

"The whole idea here is that we would capture data from a large number of vehicles," Jones said at another meeting of transportation officials in May. "That data could then be used by public jurisdictions for traffic management purposes and also by private industry, such as DaimlerChrysler, for the services that they wish to provide for their customers."

According to USDOT's 10-year plan, the key "data" the INTI will collect is "the identity and performance of transportation system users."

P-090-027

"It's going to happen," said Jean-Claude Thill, a professor at the University of Buffalo who specializes in transportation and geographic information and who has done research for USDOT. "It's probably going to start in the large metropolitan areas where there's a much larger concentration and more demand for the services that are going to be made available."

With this system, and the fantastic technology it will enable, the government and the auto industry claim they can wipe out all but a fraction of the 42,000 deaths on America's roads by literally intervening between the drivers, cars and the road. But as they careen toward making it a reality, its costs in terms of individual privacy have barely been contemplated.

If the government has its way, these technologies will no longer be optional. They'll be buried deep inside our cars at the auto factory, unremovable by law. If things go as planned, within the next decade these devices will begin transmitting information about us to the government, regardless of whether we want to share it or not.

More chilling still is the fact that Creative Loafing isn't the first to use the "Big Brother" label to describe the system. Even the corporate leaders working to create it refer to it in Orwellian terms. At a workshop for industry and government leaders last year, John Worthington, the President and CEO of TransCore -- one of the companies currently under contract to develop the on-board units USDOT wants to put in your car -- described INTI as "kind of an Orwellian all-singing, all-dancing collector/aggregator/disseminator of transportation information."

This story really begins in 1991, the year Congress established a program to develop and deploy what is now called "Intelligent Transportation Systems," or ITS. At the time, most ITS technology was in its infancy. But even back then, the long-term goal of the federal government and the automobile industry was to develop and deploy a nationwide traffic monitoring system. A transportation technology industry quickly sprang to life over the next decade, feeding off federal money and the corporate demand for wireless technology.

Since 1991, the driving force behind the INTI has been the Washington, DC-based Intelligent Transportation Society of America (ITSA). This powerful group of government and corporate interests has spent tens of millions of dollars lobbying to bring the INTI to life and worked side by side with USDOT and its agencies to create it.

A look at its shockingly broad 500-organization membership base shows just how much clout is behind the push to create the information superhighway. Forty-three of the 50 state Departments of Transportation are members, including the North Carolina DOT. Dozens of transportation departments from large and medium-sized cities, including the Charlotte Area Transit System, are also members. So are most of the key corporate players in the transportation technology industry and America's big three auto manufacturers.

Though the membership of the Board of Directors changes every year with companies cycling on and off, over the last two years, ITSA's board members have included executives from General Motors, DaimlerChrysler, Ford Motor Company, and executives from the technology companies helping to develop the on-board units, including TransCore and Mark IV Industries. The board has also included federal transportation bureaucrats like Jeff Paniati, the Joint Program Office director. ITSA president and CEO Neil Schuster says the bulk of the group's $6 million annual budget comes from its corporate members, money that ITSA then turns around and uses to lobby Congress and the federal government for further development of the INTI.

So why haven't you heard about ITSA or the INTI? Until recently, most of the groundwork necessary to lay the foundation for the system has been highly technical and decidedly unsexy. That's because before industry leaders and government officials could hold the first transceiver in their hands or bury it inside the first automobile, they had to create a uniform language for the system and convince the Federal Communications Commission to set aside enough bandwidth to

P-090-027

contain the massive amount of data a constant conversation between cars, the road and the system would produce.

A half-decade later, with the computer standards 90 percent complete and the bandwidth set aside by the FCC, they're on the brink of a transportation revolution.

To most drivers, the above probably sounds pretty far-fetched. National databases to track our every move? A national network of government-controlled traffic management centers that use wireless technology for traffic surveillance by 2022? But the reality is that much of the technology and infrastructure needed to bring the system to life has already been put in place.

In the old days, if you turned on your windshield wipers, power just went to the wipers. But in the cars of today, a miniature self-contained computer system of sensors and actuators controls the wipers and just about everything else the car does. All that information winds up on something inside your car called a data bus.

"We have the ability to communicate essentially any of the vehicle information that's on that data bus, typically encompassing the state of about 200 sensors and actuators," said Dave Acton, an ITS consultant to General Motors. "Anything that's available on the bus is just content to the system, so you could send anything."

For automakers and tech companies, the databus is a goldmine of information that can be transmitted via imbedded cell phone or GPS technology. This year alone, 2 million cars in General Motors' fleet were equipped with the GPS technology that would enable customers to subscribe to OnStar-type services if they choose. Eventually, says Acton, all cars will likely be equipped with it.

But the same technology installed in GM's fleet is also capable of transmitting the car's location and speed to any government agency or corporate entity that wants it without the driver knowing, whether they subscribe to OnStar-type services or not.

Though government-run transportation centers across the country are not yet collecting the data, Acton predicts they will begin to within the next decade.

Ann Lorscheider agrees. She's the manager of the Metrolina Region Transportation Management center on Tipton Drive in Charlotte.

At the center off Statesville Avenue, traffic management specialists stare at dozens of television screens mounted on a massive wall, watching for accidents or anything out of the ordinary. From their workstations, they surveil 200 interstate miles, including I-77 from the South Carolina state line to US 901 in Iredell and I-85 from the state line into Cabarrus County.

When they need to, they can swivel the cameras mounted along the interstate or zoom in to get a better look at an accident. Sensors in the road constantly dump data back to the center on traffic patterns and speed. A system based on predictive algorithms tells them if a traffic pattern signals a potential problem.

The cameras and the sensors were installed by the state in 2000, at a cost of $41 million. Traffic management centers like the one Lorscheider runs can now be found in just about every major to mid-sized city or region across the country, most constructed in over the last decade or so.

News reports show that over the last five years alone, there has been an explosion in the construction of these centers. During that time, over 100 such centers have opened across the country, part of a boom driven by the USDOT and its sub-agency, the Federal Highway Administration, which has secured funding to help bring the centers to life.

"They're booming," said Lorscheider. "They're all over the place now."

Everywhere they've opened, the centers have decreased response time to accidents and slashed, sometimes by as much as half, the number of law enforcement personnel needed to

P-090-027

respond to accidents and get traffic moving again. Congestion and travel times have also improved.

This all sounds fine and safety-centered. But in the future envisioned by USDOT and ITSA in federal documents, the centers will be far more than a handy congestion management tool. They'll form the very hub of the INTI itself, interacting with regional and national traffic centers and, ultimately, with immense national databases run in partnership with the private sector that will cull data from vehicles, crunch and archive it.

To bring the INTI to life the way the government plans, the system will have to do far more than use GPS technology to transmit where cars have been and what they did along the way. Cars will need to swap information instantaneously with each other and with roadside readers at highway speeds in real time, something today's GPS technology can't do. To solve the problem, the federal government is pushing back the boundaries of wireless technology to create devices that can make the vision possible. Using something called Dedicated Short Range Communications, or DSRC, the transceivers the government is developing would allow cars to carry on simultaneous conversations with each other and with corresponding roadside units, sending messages or warnings throughout the transportation management system instantly.

These "conversations" could prevent collisions or stop drivers from running off the road, while giving transportation managers an instantaneous view of road and weather conditions. With a DSRC transceiver and GPS technology in every car, automakers believe they can wipe out nearly all automobile fatalities in the US. It's a goal they call the Zero Fatalities Vision.

"There is a basic consensus that we have to change the safety paradigm," said Chris Wilson, Vice President of ITS Strategy and Programs at DaimlerChrysler Research and Technology North America, Inc. "Everything we've done up until now -- airbags, seatbelts -- was to mitigate accidents once they occur. Now we're looking to prevent accidents. To do that we need live vehicle-to-vehicle communication and vehicle-to-vehicle infrastructure."

The tantalizing prospect of saving thousands of lives comes with a heavy price. The same technology that will allow cars to talk to each other in real time would also allow the government and ultimately private business to use the INTI to track every move American drivers make -- and profit from it.

This is the dark side of the information superhighway, the one executives and federal bureaucrats don't like to talk about. That's probably because they know it's entirely possible to use the technology the government is developing to prevent fatal collisions without harvesting information from automobiles and archiving it.

For all their talk about saving lives, there's ample evidence that the driving force behind the push to develop the national information superhighway is to profit from the data it collects. Both the corporations and the government -- including the more than 40 state departments of transportation that are members of ITSA -- stand to eventually rake in billions in revenues if they can bring the system to life. (See sidebar, "A Marketer's Dream.")

But first, they must find a way to harvest and archive the data.

That's where the ADUS, or Archived Data User Service, project comes in. For the last five years, while they were laying the foundation for the INTI, USDOT and ITSA have also begun setting standards for the massive databases that will collect and archive information.

According to federal documents, when it's completed, the brain of the INTI will essentially be a string of interconnected regional and national databases, swapping, processing and storing data on our travels it will collect from devices in our cars.

According to the "ITS Vision Statement" the Federal Highway Administration published in 2003, by 2022, each private "travel customer" will have their own "user profile" on the system

P-090-027

that includes regular travel destinations, their route preferences, and any pay-for-service subscriptions they use.

Neil Schuster, president and CEO of ITSA, further clarified that goal in a recent interview with Creative Loafing.

"In fact, when we talk about this, the US government is talking about creating a national database, because where cars are has to go into a database," Schuster said.

Most INTI enthusiasts, like Schuster, insist that the lives potentially saved by this technology are worth giving up some privacy.

"When I get on an airplane everyone in the system knows where I am," said Schuster. "They know which tickets I bought. You could probably go back through United Airlines and find out everywhere I traveled in the last year. Do I worry about that? No. We've decided that airline safety is so important that we're going to put a transponder in every airplane and track it. We know the passenger list of every airplane and we're tracking these things so that planes don't crash into each other. Shouldn't we have that same sense of concern and urgency about road travel? The average number of fatalities each year from airplanes is less than 100. The average number of deaths on the highway is 42,000. I think we've got to enter the debate as to whether we're willing to change that in a substantial way and it may be that we have to allow something on our vehicles that makes our car safer. . . I wouldn't mind some of this information being available to make my roads safer so some idiot out there doesn't run into me."

Schuster insists that drivers shouldn't worry about the government storing information about their travels because personal identifying information would be stripped from it.

"They're not going to archive all of the data, they're going to archive the data they need," Schuster said. "They want origin, they want destination, they want what route that vehicle took. They don't want the personal information that goes with that because it's useless to them."

Schuster's words would be more reassuring if they didn't contradict planning documents authored by his organization and USDOT.

ITSA's own website on ADUS says data archived by INTI databases will include "vehicle and passenger data." So does the USDOT's Ten-Year-Plan. In fact, according to ITSA's own privacy principles, which are printed on its website, transportation systems will collect personal information, but only that information that's relevant for "intelligent transportation system" purposes.

"ITS, respectful of the individual's interest in privacy, will only collect information that contains individual identifiers that are needed for the ITS service functions," the site reads. "Furthermore, ITS information systems will include protocols that call for the purging of individual identifier information that is no longer needed to meet ITS needs."

In other words, identifying information will be purged when government and corporate users no longer have a need for it, not when it becomes a privacy issue for an individual driver.

Everyone Creative Loafing spoke to for this article, and every federal document we examined, insisted that safeguards would be put in place to protect this data. So far, though, no one has been able to specify exactly how these safeguards will work.

It's a problem Eric Skrum, Communications Director for the National Motorists Association, is familiar with.

"Information on this is awfully hard to get and it's also very conflicting, where one hand will be telling you one thing and the other will be saying oh no, we wouldn't possibly be doing that," Skrum said.

It's a problem Creative Loafing ran into as well. For instance, Schuster insists that the data the system will eventually collect won't be used to issue people speeding tickets or other traffic citations.

P-090-027

But according to ITSA's own privacy principles, the information won't be shared with law enforcement -- until states pass laws allowing it. In fact, the US Department of Justice and USDOT are already working on a plan to share the data ITS systems collect with law enforcement. It's called the USDOT/DOJ Joint Initiative For Intelligent Transportation & Public Safety Systems, and its aim is to coordinate the integration of the system with police and law enforcement systems by developing the software and technical language that will allow them to communicate.

After Sept. 11, ITSA and USDOT added a homeland security addendum to their 10-year plan. The system, through wireless surveillance and automated tracking of the users of our transportation system, could bolster Homeland Security efforts, it said.

Sensors deployed in vehicles and the infrastructure could "identify suspicious vehicles," "detect disruptions" and "detect threatening behavior" by drivers, according to the addendum. Those who take public transit wouldn't escape monitoring, either. The addendum suggests "developing systems for public transit tracking to monitor passenger behavior."

So who will control the information transmitted by the on-board units? That's still up in the air, too. Like the black boxes now installed in cars that record data before a crash that can later be used against the driver, it's possible that the on-board units will be installed in new cars before the legal issues surrounding the data they collect are fully resolved, says one industry insider.

Robert Kelly, a wireless communications legal expert who has acted as legal council to ITSA, says privacy law will have to evolve with the technology. In other words, privacy issues probably won't be resolved until the technology is already in place. Legislatures and Congress will have to guide how everyone from law enforcement to corporations use the data and exactly what information they have access to, Kelly said.

But again, with privacy organizations largely in the dark and the development of the system hurtling forward, the question is how much influence, if any, privacy advocates will be able to wield before these devices are installed on the first future fleet of cars.

That's part of what frustrates Skrum, the National Motorists Association communications director. "Because this is being done behind closed doors to a certain extent, the public isn't really going to have much to say about it," said Skrum.

The good news is that there's still time for the public to weigh in. It will take USDOT at least three more years of development and consumer testing before the first prototype "on-board unit" is ready. In the meantime, the federal government, automakers and the state departments of transportation will have to hash out a couple of billion-dollar details. So far, the government has borne nearly all the cost of developing the on-board units. But that will soon change. For the system to work, automakers must sign on to mass produce the on-board units and install them in cars, a move that will cost billions.

At the same time, the government must install the roadside readers to transmit the messages cars send, or the on-board units will be useless. So to bring the system to life, the government must spend millions, if not billions, on roadside units to communicate with cars at roughly the same time automakers begin installing the on-board units.

As Japan, Europe and foreign carmakers dash to develop similar technology, US automakers are under tremendous pressure. This is creating something of a chicken and egg situation. Given the nature of federal and state transportation budgets, the rollout of roadside units is likely to be gradual, starting at select trouble spots across the nation. But automakers say they need a mass deployment to make their effort worthwhile. They want to see a rollout of at least 400,000 roadside readers over about a three-year period.

A decision is currently slated for 2008, when automakers and the USDOT plan to come together to hash out a deployment strategy. At stake will be billions of dollars -- both in

P-090-027

investments and profits. If the government and automakers can agree on a deployment plan, technology companies are expected to begin investing more heavily in the further development of programs the technology will enable.

ITSA projects that $209 billion could be invested in intelligent transportation technology between now and the year 2011 -- with 80 percent of that investment coming from the private sector in the form of consumer products and services.

Jean-Claude Thill, a professor at the University of Buffalo who specializes in transportation and geographic information systems, says he believes the system will be deployed, just not as fast as car makers would like.

"It's not going to happen all at once," said Thill. "Look at cell phones. Right now in large urban areas you have a high density of cell towers so you have good coverage. If you venture on the interstate your signal gets weak and sometimes you lose it. You can't expect this to be different."

Thill says he believes the automobile manufacturers are playing hardball with the government to make sure the infrastructure is put in place quickly.

"I think the automobile manufacturers will do it," said Thill. "There is money in it. I think as the market develops in large urban areas, they will see that it is in their interest to get on the wagon. But nothing is going to happen until they are on board."

From the government's perspective, the good news is that a few sensors in a few cars and a little GPS technology can go a long way.

"Only a relatively small percentage of the approximately 260 million vehicles on US roads today need to be equipped with communication devices for the system to start producing useful data," said Bill Jones, the Technical Director of the USDOT's ITS Joint Project Office in a speech to the National Research Council's Transportation Research Board in January. "With 14 to 15 million new vehicles sold in the US each year, within two years you can have 10 percent of all vehicles equipped. We already know from our previous studies that a vehicle probe saturation of less than 10 percent can provide good information."

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Data Mining and Surveillance

www.fromthewilderness.com/free/ww3/012605_watching_you.shtml

They're Watching You (about data mining corporations versus personal privacy)

... We appear to be on the brink of a post-September 11 surveillance society. In one optimistic scenario, the U.S. is employing its full range of technical ingenuity to ferret out terrorists, using all the resources of the Digital Age and its quirky software geniuses. Meanwhile, dazzling new biometric identifiers -- iris scans, voiceprints, DNA registries, and facial recognition software -- are about to reduce identity theft to a quaint memory even while they shorten airport security lines and speed up credit approvals.

But in a less appealing second scenario, we could be on the verge of surrendering every detail about our private lives to an all-knowing Big Brother alliance of cops and mysterious private security corporations. They'll promise to protect us from terrorists. But along with that safety, we'll face arbitrary and unappealable decisions on who can fly in a commercial airliner, rent a truck, borrow money, or even stay out of jail.

That's the conundrum at the center of No Place to Hide, a finely balanced look at the see-saw struggle between security and privacy. Author Robert O'Harrow Jr., a Washington Post reporter, deftly shows how the government and its contractors have been lurching between these two goals ever since the September 11 terrorist attacks raised homeland security to the public's top priority.

P-090-027

The biggest threat and the biggest promise seem to lie not with official government databases but with the private companies that sell their information to all levels of government and to banks, airlines, credit-card companies, mortgage holders, car-rental agencies, and the like. ...

After September 11, it was only natural that these companies would volunteer their services in tracking terrorists. They had a head start in a critical technology: data mining. In practical terms, that involves cross-indexing every conceivable source of information -- unlisted telephone numbers, credit-card records, appliance warranty cards, insurance claims, arrest warrants, Social Security numbers, child custody orders, book purchases, E-ZPass records -- to compile a list of suspects or even possible terrorists that need to be placed on the Homeland Security Dept.'s "no fly" list.....

www.fromthewilderness.com/free/ww3/012005_ptech_pt1.shtml
PTECH, 9/11, and USA-SAUDI TERROR - Part I
PROMIS Connections to Cheney Control of 9/11 Attacks Confirmed, by Jamey Hecht, With research assistance by Michael Kane and editorial comment by Michael C. Ruppert

.... Total Information Awareness or TIA, an Orwellian nightmare of data mining that uses PROMIS-evolved technologies and artificial intelligence, is now operating and able to incorporate vastly divergent data bases of personal information on private citizens from computer systems using different languages in near-real-time. Every bit of personal information from grocery shopping habits to driving records, credit reports, credit card transactions and medical records is now almost instantly accessible. Access will be expedited and broadened to local law enforcement agencies when what will become a national ID card comes into being. That will happen as driver's licenses are standardized nationwide (following the recent intelligence reform act) to include a simple UPC-like code that will allow approved agencies to get all of our data. The surveillance and intervention capabilities of PROMIS progeny can now be used to prohibit a credit card purchase or (soon) prevent someone from boarding a commercial aircraft. These capabilities could also be used to empty a private bank account or - when coupled with biometric face recognition technology - prevent you from making a withdrawal from your bank or even buying food.

In every one of these software applications there are two themes: machines that "talk" to each other and artificial intelligence. (Please see Crossing the Rubicon). As you will see below, these capabilities are now known to exist.

TIA has been renamed several times. We know that the first software was delivered to the Defense Advanced Research Projects Agency (DARPA) in 2003. Its latest nom de guerre is TIE or Trusted Information Environment. According to the San Francisco Chronicle last October TIE now allows the government to access private databases without a warrant. I go one step further to assert that TIE allows access to private databases without the knowledge of the database owners, provided only one condition exists: the database can be accessed through the internet.

And although the public face of TIA pretends that these technologies have not yet been applied, we are certain with the publication of this story that the same software the government needs is already in use by private corporations - the big ones - and we remind the reader that FTW's map of the world states that the government has been turned into a franchise operation of these corporations anyway. So where's the seam?

What the courageous and brilliant Indira Singh has to tell us is a matter of monumental importance. Based upon these new revelations which confirm what I suggested in Crossing

P-090-027

the Rubicon every American and quite likely every citizen of an industrialized nation should assume that all of these technologies are operational today. A bit of breathing room is left as I conclude that they have not been sufficiently deployed yet to monitor all citizens in real time. My best assumption is that right now perhaps a million or so high-interest Americans are under constant surveillance; all by computer technology which has proven so accurate that it can detect suspicious movements just by correlating gasoline and food purchases with bank withdrawals and utility consumption. [--Michael C Ruppert]

www.theage.com.au/news/technology/how-they-keep-track-of-our-every-move/2006/02/03/1138836402623.html?page=fullpage#contentSwap2

Eyes on the road

February 3, 2006 - 11:19AM

Speed cameras, red-light cameras, e-tags. Innocuous technology to make the roads safer and our journey simpler ... or a series of "Little Brothers" keeping track of our every move? Nikki Barrowclough looks behind the boom in traffic monitoring.

Eight years ago, on the night that a Saudi diplomat was brutally murdered in his Canberra apartment, a car was filmed travelling south along the Hume Highway towards the national capital. Then, a few hours later, it was filmed heading north back towards Sydney.

The car wasn't being tailed by the Australian authorities, the Saudis or anyone else. The "spy" was a humble traffic camera, although this emerged only after four people were arrested and brought to trial over the diplomat's violent death. The fact that the camera had been set up to monitor speeding and unregistered trucks didn't cause a ripple. The candid Safe-T-Cam had, in fact, filmed every vehicle travelling along that stretch of the Hume. So when the diplomat's ex-lover insisted to police that she and her new boyfriend had been in Sydney at the time of the crime, the authorities had only to look at an image of her car fleeing back up the highway to know that she was lying.

Few people would be troubled by the use of traffic cameras to locate criminal suspects. But the Canberra incident highlights how the mass surveillance of motorists, far from being an Orwellian conspiracy theory, is now routinely practised and growing more pervasive by the year. In Australia and other major Western countries, traffic is increasingly monitored with the sort of sophisticated technology that makes the image of a shadowy figure watching through binoculars seem impossibly quaint. Whether we're appearing in "real time" on one of the hundreds of traffic cameras operated by central command centres in Melbourne and Sydney, being "flashed" on a speed or red-light camera operated by the police, or clocked on a toll road with our seemingly innocent e-tags, it's almost impossible to drive anywhere without being monitored and/or leaving an electronic data trail.

It's even getting harder to disappear on obscure back roads thanks to GPS - the US military-developed global positioning system whose satellite tracking can pinpoint a car's location to within a few metres. A group of Stanford University academics in the US are reportedly working on satellite navigation systems so accurate they will be able to tell authorities whether you're in your car or standing next to it. This is revolutionary technology, and great if you get lost or have an accident or your car is stolen. But there's a chilling aspect to it all as well - namely, the loss of individual privacy.

Two years ago, the Office of the Victorian Privacy Commissioner devoted an entire edition of its newsletter, Privacy Aware, to just one subject: "Privacy and the Car". It included a brief section on telematics, the term used to describe the combining of satellite GPS, in-car computers and mobile phone technologies. "Telematics raises concerns because, while GPS receivers

P-090-027

cannot send data back to a central location, mobile phones can. Used together, they turn the vehicles they're embedded in into very powerful tracking and monitoring devices," the report declared.

How much covert monitoring goes on in tandem with open surveillance, such as speed cameras, is anyone's guess, because that's not the sort of information governments readily disclose. Professor Roger Clarke, a Canberra consultant in data surveillance and information privacy, regards the Hume Highway incident as an example of "function creep" - when technology, set up for one purpose, secretly ends up serving another purpose as well. And function creep, he says, is a way in which the "surveillance society" has sneaked under the public's guard.

"The social and political commentators have missed it, but what's more worrying is that young people have grown up with surveillance and have a different attitude to it," Clarke says. "They think life's like that."

Governments and transport authorities insist that such surveillance systems are totally benign. They are about road safety, keeping people alive, and managing increasing volumes of traffic more efficiently, they say. This isn't just soothing rhetoric - with around 1600 deaths on Australian roads last year alone, road safety is a huge issue - but at the same time we seem to have ceded our civil rights as motorists.

Cameron Murphy, president of the NSW Council for Civil Liberties, does not doubt that surveillance technology is about much more than simple traffic management.

"Most people are aware that speed cameras and red-light cameras are obviously there for infringement purposes," Murphy says. "But we are also aware that there's an extensive network of cameras that can track people from one end of the city to the other, along freeways and on main arterial roads.

"You should be able to go from A to B without the government monitoring you. If the prime motive is traffic management alone, then you don't have to survey one end of the freeway to the other - it doesn't add up. That's when it becomes an invasion of privacy ... Recording where people go, what time of day they travel. If there aren't appropriate controls, the data could be used for commercial purposes or by any other government agency."

Given the fear of terrorism and the heightened national security alert, the potential of some of the new "smart road" technologies is obvious. For instance, British firm Hills Numberplates has already devised so-called e-Plates, numberplates embedded with radio frequency identification (RFID) tags. These tags act as tracking devices that transmit a unique, encrypted ID code via silicon chips that cannot be seen or removed. Known as a silent technology, RFID is sometimes described as a sophisticated barcode because it can identify and track goods from a distance.

Hills Numberplates claims a single "reader" positioned at the roadside can identify dozens of vehicles fitted with an e-Plate, moving at any speed, at a distance of up to 100 metres. But will they catch on here? VicRoads has no plans to bring in e-Plates. However, the NSW Roads & Traffic Authority says they have certainly been up for discussion - though as yet there's no decision to introduce them.

"But as with everything of this nature, it's a case of watch this space," a spokesman says.

Transport authorities are also keeping an open mind about an electronic version of the vehicle identification number (VIN) that comes with every car. A Department of Transport and Regional Services spokesperson in Canberra says that while there are no plans "at this point in time" for an electronic VIN, that doesn't mean it won't happen.

Melbourne-based academic Professor Marcus Wigan, an adviser to the US Department of Transport, is also the Australian Privacy Foundation's spokesman on intelligent transport systems. He says e-VINs (which would transmit to a central location as cars pass specific points)

P-090-027

are simply a more efficient way of managing the many regulatory aspects of the identity of vehicles. An e-VIN would certainly decimate the stolen car trade, but it would also obviously increase the ability of authorities to track cars and monitor daily travel routines.

The expression "intelligent transport systems" (ITS) is a catch-all phrase for the in-car electronics, smarter roads, satellite navigation technology, tolling systems and remote road monitoring being employed increasingly throughout the world - sometimes without limit.

Last September, as Hurricane Rita bore down on Texas, and hundreds of thousands of motorists fleeing the Houston area became trapped in a 200-kilometre traffic jam in which cars were abandoned and people collapsed from heat exhaustion, officers from the state's highway system were reportedly scanning e-tags to make sure evacuees had paid their tolls.

Meanwhile, London's Independent newspaper reported late last month that the United Kingdom was about to become the first country in the world where all motorists would be monitored by a vast network of cameras that would read the licence plates of every passing car. Neither the Home Office nor the British police denied the story, or the paper's claim that the ultimate plan was to build a huge database of vehicle movements so that police and security services could analyse the journeys of individual drivers.

And in the US, the Washington-based Intelligent Transportation Systems Joint Program Office - a powerful, 500-strong group of car manufacturers, technology companies and government interests - has reportedly spent more than $4 billion and almost 15 years developing a system of tracking and sensor technology that would collect data on the movements of every driver and public transport user. The stated aim of this system, known as the Integrated Network of Transportation Information, is to reduce the 40,000 or so annual road deaths in America by allowing government agencies to intervene directly between drivers, their cars and the road. And authorities want to have it in place within the next decade.

Whether or not they were designed for such purposes, what intelligent transport systems do is identify specific vehicles - and, therefore, their drivers.

The term first cropped up in Australia about 15 years ago. In 1992, an organisation called Intelligent Transport Systems Australia was set up in Melbourne, and today its membership base includes government, scientific, academic and car manufacturing groups. The group's executive director, Brent Stafford, says he expects that all new vehicles will be equipped with satellite navigation and telematics by 2010. And while he says he understands people's unease about such technologies, he can't see why such systems would be used to track Australians en masse, as seems to be the intent in Britain.

"It's quite easy to track the movements of every vehicle, but you'd have to ask, 'What for?'" says Stafford. "You'd also have to consider how much it would cost. ITS is the application of technology to transport. It's not the application of technology to security. The fact is, there'll be lots of Little Brothers looking after you, but no Big Brother spying on you."

Lachlan McIntosh, chief executive of the Australian Automobile Association, shares Stafford's view. "Why would you want to track everybody? And what would you do with all that data?" he asks.

When Good Weekend suggests to him that, given the uncertain times we live in, such surveillance options could be very attractive to government departments, he replies: "In France during World War II, everyone was tracked and monitored without these technologies.

I think surveillance comes and goes in society ... If there's a political will to monitor what everybody does, then it's likely to happen.

"In the end, there are a lot of benefits in monitoring where you are: the emergency response if you are to have an accident, for instance ... If, as you say, this will happen, and everyone had a monitoring device in their car that said they just had an accident, we may well save 100 or 200

P-090-027

lives a year. Okay, you may well have been going to Cronulla when you shouldn't have been, or maybe you had an unfortunate crash and nearly died, but you were saved because of the device. There are trade-offs in those discussions, and we often forget the benefits when we talk about the downside."

There are also advantages in being able to keep an eye on hazardous cargo or large sums of money, he adds. "We all want to know that if a cargo of ammonium nitrate goes missing, it can be tracked and found. Is that an intrusive activity on the driver of the truck? Well, maybe it is, but it's a security mechanism as well. Now, should you want to put surveillance on a particular car for some criminal activity, I imagine you would need a warrant and you would have to go to a magistrate to obtain it. So I would think Australians would want to ensure that they are protected through our court system against the undue use of surveillance."

People have to be informed about the benefits of the new technology, what the implications are and what the risks are, he adds. "As long as we have that sort of reasonably informed debate in Australia, I think we're likely to want to adopt the latest technology."

But is there debate? Dr Peter Chen, a political scientist who lectures in communications at the National Centre for Australian Studies at Monash University, says Australians tend to be relatively passive when it comes to such matters.

"While we like to tell ourselves that we have a healthy disregard for government, it's total fiction. We're very accepting of increased state security and surveillance for whatever reason," Chen believes. And when governments talk up safety as a way of getting more surveillance systems under the wire without causing public alarm, we generally accept official reasoning.

"That's the argument that's always used," says Chen. "No government ever says we're introducing wide-scale surveillance for anything but notions of public safety, and while the paranoid concerns of some people are somewhat overstated, systematic surveillance technologies are very compelling tools for governments of all persuasions, and tend to inevitably lead to the expansion of their use into other areas of public policy."

Remote surveillance, like static cameras and portable speed cameras, is cheap, too; much cheaper than human surveillance. "This was a key argument in the government's support for electronic tagging of terrorist suspects late last year: surveillance technologies are cheaper than policing," he says.

Police in NSW recently began using high-tech scanning units that employ automatic numberplate recognition (ANPR) technology to "read" the registration of passing vehicles and check them against an RTA database, as a way of detecting stolen and unregistered vehicles. Victoria Police trialled the technology, too, but has opted instead for mobile data terminals linked to the main police computer system, from which police can also access the VicRoads registration database. Seven hundred of these terminals are now being fitted to police cars, motorbikes, boats and helicopters by the Victorian Department of Justice.

Paul Chadwick, the Victorian Privacy Commissioner, wrote about ANPR technology during the trial. The systems, he pointed out, can be linked to existing surveillance camera systems, "so multiplying the 'eyes' of the State, and can be linked to a variety of databases, so expanding the State's 'memory'".

Meanwhile, the ordinary motorist, blithely driving across town or to a lunch in the country, should think twice about e-tags - those small, wireless electronic transponders attached to the windscreen that collect information about a car's movements and charge the owner a toll.

The e-tag revolution kicked off in Melbourne in 2000 with the opening of the privately operated, 22-kilometre CityLink, one of the world's first automated, fully electronic toll roads. In Sydney, both the controversial Cross City Tunnel and the recently opened Westlink M7 are also fully automated. This means that toll-road operators, whether they're government or private

P-090-027

companies, can collect personal information such as your vehicle registration, driver's licence number, credit card details, name and address and your pattern of travel.

And that's a concern to lawyer Anna Johnston, a former NSW deputy privacy commissioner who's now the chair of the Australian Privacy Foundation. As she notes, drivers on these toll roads now have no choice but to identify themselves every time they use them. "I don't want to indulge in conspiracy theories, or say that we have reached that 'Big Brother' point," she says, "but there is a danger we are sleepwalking into a situation where more and more of our information can be logged, tracked, profiled and matched in ways that haven't really been contemplated in the past. That may not be the intention at the time a new technology is introduced - but of course with each new technology, with each new chipping-away at our privacy, it makes the next step so much easier."

Johnston's foundation campaigned against a law passed in NSW last May, which allows the RTA to issue photo identity cards to non-drivers over 16 years of age (VicRoads has no plans to introduce the voluntary scheme).

"We weren't against the concept of a photo ID card for non-drivers - there's a need for it, clearly - but we suggested an alternative way to develop it, so that it didn't result in one database being held by one agency covering the entire population, whose details get printed on a card which is both unique and universal. All that, of course, is like a national ID card, which Australians rejected in 1987."

The bill didn't limit the type of information that could be collected and stored, Johnston says, and the legislation specifically allowed the RTA to put the two databases (driver and non-driver) together. She's concerned the latter will eventually happen.

However, both the RTA and a spokesman for the NSW Roads Minister, Joe Tripodi, assured Good Weekend that the photocard database would be kept separate from other databases within the authority, and that there would be separate databases for drivers and non-drivers. In a statement, the RTA also said that databases kept on NSW motorists are not integrated, for privacy reasons, and that access to one database doesn't automatically mean access to another.

The inevitability of more privately run, cashless toll roads, and a more widespread user-pays road system means there'll be more databases and more information stored on motorists. Privacy laws protect access to all databases, although privacy advocates tend to be lukewarm about their effectiveness.

"You get principles that sound great in theory, like, 'This information should only be used for the purpose for which it's collected, or with your consent', and people say, 'Oh good'," says Nigel Waters of the Australian Privacy Foundation. "Then you look at the fine print where it says, 'Except in emergencies, for law enforcement and a whole raft of other exemptions.'"

But the acting Privacy Commissioner for NSW, John Dickie, argues the Privacy Act is not without teeth. "Government departments and agencies are subject to it. People can't just wander off and get around things - [though] if there is a serious crime, all bets are off," he says.

Four years ago, a former employee of Transurban, the company that operates CityLink, admitted in court that he had passed on the credit-card details of more than 8000 CityLink customers to cyber thieves, who then used them for an internet spending spree. A subsequent review of Transurban's information handling practices by the Office of the Federal Privacy Commissioner found Transurban needed to take steps to reduce the risk of further privacy breaches. The FPC won't detail what those measures involved.

A spokesman says there were no fundamental problems and that Transurban merely needed to "enhance" existing systems.

Meanwhile, Transurban has told Good Weekend that it takes the protection of personal information seriously, and that the manner in which it manages the use and disclosure of personal

P-090-027

information goes beyond obligations imposed by state and federal privacy legislation. The information it collects on its database is used only for collecting tolls and enforcing toll collection, isn't available to other organisations, and is only made available to police or to an authorised government body once there's a properly authorised written request.

It's not just toll-road operators who are amassing huge amounts of data on private citizens. In what could almost be called privatised intelligence gathering, the outsourcing of traffic management systems to private-sector organisations means more databases still. One such organisation is Tenix, the contractor employed by Victoria Police to operate its speed cameras - and which wrongly fined more than 100 motorists last July after the wrong speed limit was entered into the machine by an operator.

"I guess if there's a concern about the private-sector organisations holding increasing amounts of data, it's, 'Where are they holding it, how secure is it, and what purpose are they putting it to?'" says Monash's Peter Chen, who believes we will soon be talking about "data laundering" the way we now talk about money laundering. "I think it's safe to say that governments around the world, not just in Australia, have been lousy at regulating the movement of data about members of the public held by private-sector organisations.

"We have privacy laws which are relatively tight, but ... if you put a large chunk of the general surveillance system data into private hands, the company that picks up that contract will undertake that work in the most effective and efficient way for their profitability. And that might mean warehousing and processing data offshore, outside the legal jurisdiction of Australian governments. If I were a car company, I'd be very interested in finding out about the sort of people who drive a lot, who they are, what are their characteristics. If that information was held in a country with

poor data security legal provisions, then data could be sold, resold or 'stolen'. That's not a conspiracy theory view. It happens all the time. Large amounts of data get 'lost' in transit every year around the world."

Marcus Wigan points out that no one "owns" the information stored about them - so there's very little redress for consumers if their data is misused. "There's no such thing as intellectual property when it comes to information about you," he says. Nevertheless, he cautions against paranoia over intelligent transport systems, even though he has his own concerns about the data building up as a result of new technologies.

"The rules we have to manage that information are reasonably good, but not so good as to handle a situation of future cross-linkages between all those databases," he says. "So if we have [someone's] entire historical records on a range of individual databases, and at some point, for administrative convenience, a link is drawn between them, then the result is a complete history of locations, times, events of many different kinds that suddenly becomes available as a single resource. That's a quantum leap.

"Your vehicle will have had its numberplate [photographed] various times, your e-tag will have been caught - you only have to have one identification token transferred between two or more agencies for an amazing degree of record linkage with other sources of information about you and your activities over a considerable period.

"The ability to manage this is improving incredibly quickly. Once this is achieved and it's a few years away yet - we suddenly get a retrospective loss of privacy of an enormous order [and] ITS systems become surveillance systems.

"I'm not saying they'll be used in that way," Wigan adds. "I'm saying the potential for that to occur ... would then become a low-cost, low-effort issue. We need to use the time until all this is in place to educate and earn the trust of the community to secure the very real benefits of intelligent transport systems."

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P-090-028

Attachments

Several reports were sent separately that have background on the bridge issue and the issues of Peak Traffic:

the 2005 Hirsch Report prepared for US Department of Energy

International Energy Agency, Saving Oil in a Hurry, 2005

US Department of Energy, Future U.S. Highway Energy Use: A Fifty Year Perspective, May 3, 2001

Richard Heinberg, Powerdown (introduction)

Business Week admits Peak Traffic is here, gas price increases are permanent, suburbia is winding down"

"Peak Traffic"
Peak Traffic: Planning NAFTA Superhighways at the End of the Age of Oil
www.road-scholar.org/peak-traffic.html

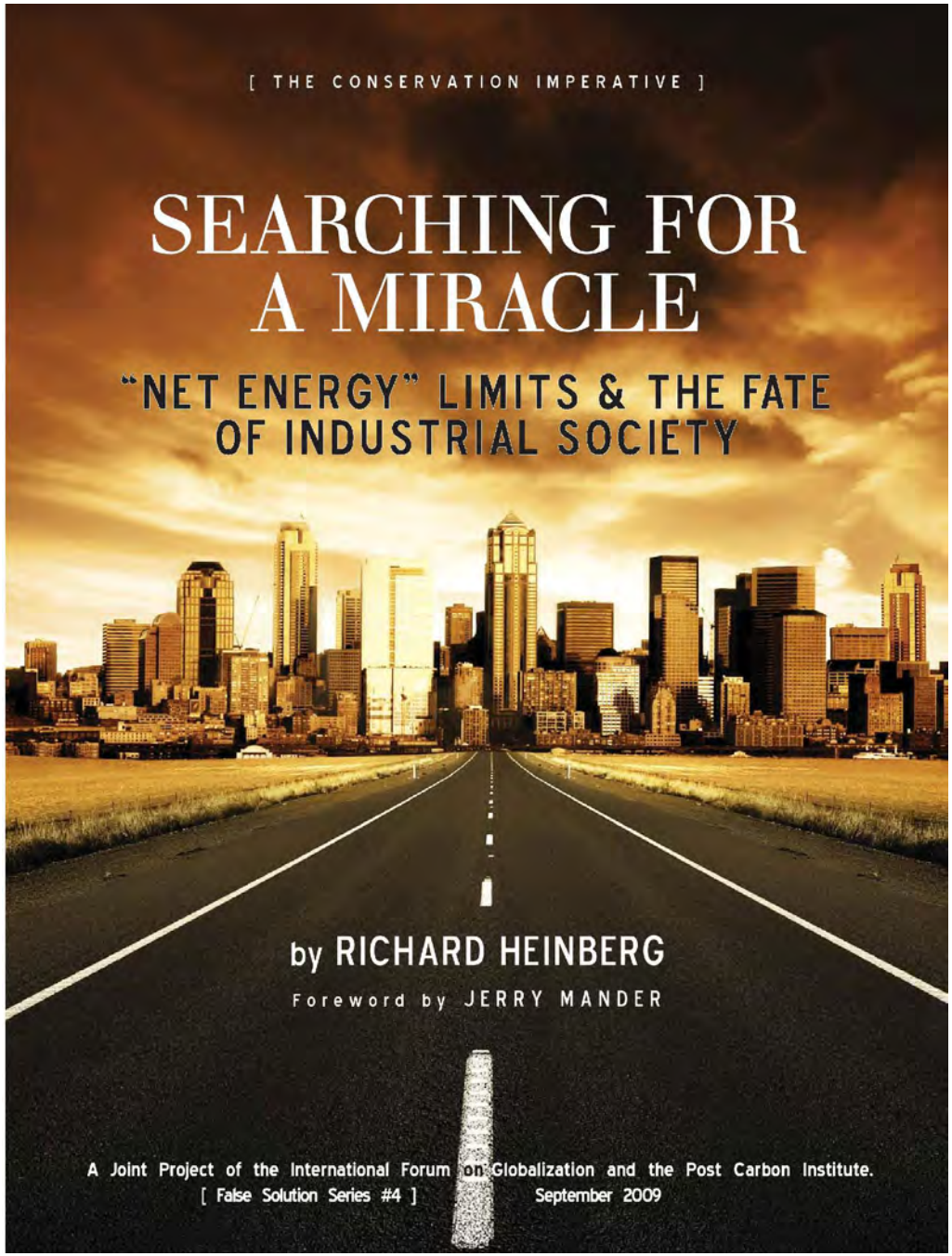
Behind enemy lines with the granola commandos
Published in Detroit Metro Times, 1993.
article about toxic waste used to power cement kilns

"Crude Oil: the supply outlook" report to the Energy Watch Group, October 2007

"Scientific American report" The End of Cheap Oil (March 1998)

P-090-028

Please see response to P-090-001.


[THE CONSERVATION IMPERATIVE]
SEARCHING FOR A MIRACLE
"NET ENERGY" LIMITS & THE FATE OF INDUSTRIAL SOCIETY
by RICHARD HEINBERG
Foreword by JERRY MANDER
A Joint Project of the International Forum on Globalization and the Post Carbon Institute.
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SEARCHING FOR A MIRACLE



'Net Energy' Limits & the Fate of Industrial Society

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CONTENTS

Foreword: Which Way Out? *by Jerry Mander* 1

One: Overview 7
- *Glossary of Terms*
- *What is Energy?*

Two: Nine Key Criteria: Comparing Energy Systems, and their Limits 15
- *1)* Direct Monetary Cost
- *2)* Dependence on Additional Resources
- *3)* Environmental Impacts
- *4)* Renewability
- *5)* Potential Size or Scale of Contribution
- *6)* Location of the Resource
- *7)* Reliability
- *8)* Energy Density
  - *a)* Weight (or Gravimetric) Density
  - *b)* Volume (or Volumetric) Density
  - *c)* Area Density
- *9)* Transportability

Three: The Tenth Criterion: "*Net Energy*" (EROEI) 23
- Returns on Investments (EROEI)
- Replacement of Human Energy
- Heyday for Fossil Fuels
- How EROEI Shapes Society
- EROEI Limits Energy Options
- EROEI: Distinct from Efficiency
- Net Energy Evaluation: Imprecise but Essential for Planning

Four: Assessing & Comparing Eighteen Energy Sources 31
1) Oil
2) Coal
3) Natural gas
4) Hydropower
5) Nuclear
6) Biomass
7) Wind Power
8) Solar Photovoltaics (PV)
9) Active (concentrating) Solar Thermal
10) Passive Solar
11) Geothermal Energy
12) Energy from Waste
13) Ethanol
14) Biodiesel
15) Tar Sands
16) Oil Shale
17) Tidal Power
18) Wave Energy
Other Sources

Five: Toward a Future Energy Mix 56
A Process of Elimination
Common Carriers: Electricity and Hydrogen
Energy Storage and Transmission
Transition Plans

Six: The Case for Conservation 65

References
Bibliography

The International Forum on Globalization
The Post Carbon Institute



Tokyo. Powered by imported oil and gas, combined with nuclear and coal. Japan is world's 3rd largest importer of oil and gas (after U.S. and China) and 4th largest user of energy (after U.S., China, Russia.) Fierce competition among industrial nations for remaining supplies, especially from Africa, South America, and the middle East, creates a precarious geopolitical situation. Japan may turn in future to more nuclear.



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As fossil fuels' supply dwindles and becomes more costly and polluting, renewed attention is on nuclear, and a theoretical "4th generation" of safer technology. But, as with proposed "clean coal" technology, "new nuclear" remains in the realm of scientific imagination, with high odds against it, and terrible downside potential. Problems of safe production, transport, waste disposal, ballooning costs, and limits of uranium supply are not nearly resolved. And nuclear's "net energy" ratio—the amount of energy produced vs. the amount expended to produce it—is low, putting it squarely into the category of "false solution."

FOREWORD: WHICH WAY OUT?

by Jerry Mander
INTERNATIONAL FORUM ON GLOBALIZATION

THIS LANDMARK REPORT by Richard Heinberg is #4 in the False Solutions series published since 2006 by the International Forum on Globalization.

Prior reports include "The False Promise of Biofuels," by IFG board member Jack Santa Barbara, which was first to predict what was confirmed a year later in dire studies from the Organization of Economic Cooperation and Development (OECD) and the United Nations—that the mad rush toward biofuels, especially corn ethanol, well underway by 2006, would cause more global environmental, agricultural and hunger problems, than it could ever begin to solve.

Despite this, U.S. policy continues to favor subsidizing industrial biofuels.

A second publication in the series, produced in partnership with the Institute for Policy Studies, was "The Manifesto on Global Economic Transitions"—a collective effort among 50 IFG Board and Associate Members. It is essentially a draft roadmap for the mandatory transformation of industrial society in recognition of limits imposed by planetary carrying capacities.

The third report, "The Rise and Predictable Fall of Globalized Industrial Agriculture," was written by former IFG executive director, Debbie Barker. That report shredded the expensively advertised notions that industrial agriculture systems are the best way "to feed a hungry world." The opposite is actually the case. The publication exposed and amplified a myriad of little-recognized connections of industrial farming to advancing hunger, global migrations, and climate change, among many other deadly effects. All of these publications are now in wide distribution.

The report which follows here, "Searching for a Miracle: 'Net Energy' Limits, & the Fate of Industrial Society," by our longtime friend and colleague Richard Heinberg, an associate member of IFG and senior fellow of the Post Carbon Institute, is the first to use the newly emerging techniques of "life cycle technology assessment," and in particular "net energy" analyses, for in-depth comparisons among all presently dominant and newly touted "alternative" energy schemes. These include all the major renewable systems currently being advocated. For the first time we are able to fully realize the degree to which our future societal options are far more limited than we thought.

With fossil fuels fast disappearing, and their continuing supplies becoming ever more problematic and expensive, hopes have turned to renewable sources that we ask to save "our way of life" at more or less its current level. Alas, as we will see, the "net energy" gain from all alternative systems—that is, the amount of energy produced, compared with the amount of energy (as well as money and materials) that must be invested in building and operating them—is far too small to begin to sustain industrial society at its present levels. This is very grim news, and demands vast, rapid adjustments by all parties, from governments to industries and even environmental organizations, that thus far are not clearly in the offing. There are, however, viable pathways forward, most importantly and urgently the need for a wide-ranging push for conservation; it is only a question of realism, flexibility,

dedication, and more than a little humility. Our beloved "way of life" must be reconsidered and more viable alternatives supported.

THE WRONG TREE

We observe daily the tragic, futile official processes that continue to unfold among national governments, as well as global political and financial institutions, as they give lip service to mitigating climate change and the multiple advancing related global environmental catastrophes. Those crises include not only climate disruption, and looming global fossil fuels shortages, but other profound depletions of key resources—fresh water, arable soils, ocean life, wood, crucial minerals, biodiversity, and breathable air, etc. All these crises are results of the same sets of values and operating systems, and all are nearing points of extreme urgency.

Even our once great hopes that world governments would rally to achieve positive collective outcomes in some arenas; for example, at the United Nations climate change talks in Copenhagen, as well as other venues, are proving sadly fatuous. But certain things are ever-more clear: Global institutions, national governments, and even many environmental and social activists are barking up the wrong trees. Individually and as groups, they have not faced the full gravity and meaning of the global energy (and resource) conundrums. They continue to operate in most ways out of the same set of assumptions that we've all had for the past century —that fundamental systemic changes will not be required; that our complex of problems can be cured by human innovation, ingenuity, and technical efficiency, together with a few smart changes in our choices of energy systems.

Most of all, the prevailing institutions continue to believe in the primacy and efficacy of economic growth as the key indicator of systemic well-being, even in light of ever-diminishing resources. It will not be necessary, according to this dogma, to come to grips with the reality that ever-expanding economic growth is actually an absurdity in a finite system, preposterous on its face, and will soon be over even if activists do nothing to oppose it. Neither does the mainstream recognize that economic systems, notably capitalism, that *require* such endless growth for their own viability may themselves be doomed in the not very long run. In fact, they are already showing clear signs of collapse. As to any need for substantial changes in personal lifestyles, or to control and *limit* material consumption habits? Quite the opposite is being pushed—increased car sales, expanded "housing starts," and increased industrial production remain the focused goals of our economy, even under Mr. Obama, and are still celebrated when/if they occur, without thought of environmental consequences. No alterations in conceptual frameworks are encouraged to appreciate the now highly visible limits of nature, which is both root source of all planetary benefits, and inevitable toxic sink for our excessive habits.

In this optimistic though self-deluding dominant vision, there is also dedicated avoidance of the need for any meaningful *redistribution* of the planet's increasingly scarce remaining natural resources toward more equitable arrangements among nations and peoples—to at least slightly mitigate centuries of colonial and corporate plunder of the Third World. And on the similarly ignored question of the continued viability of a small planet that may soon need to support 8-10 billion people? Some actually say it's a *good* thing. We should think of these billions as new consumers who may help enliven economic growth, so goes that argument. But only if we find a few more planets nearby, perhaps in a parallel universe somewhere, bursting with oil, gas, water, minerals, wood, rich agricultural lands, and a virginal atmosphere.

The scale of denial is breathtaking. For as Heinberg's analysis makes depressingly clear, *there will be NO combination of alternative energy solutions that might enable the long term continuation of economic growth, or of industrial societies in their present form and scale.* Ultimately the solutions we desperately seek will not come from ever-greater technical genius and innovation. Far better and potentially more successful pathways can only come from a sharp turn to goals, values, and practices that emphasize conservation of material and energy resources, localization of most economic frameworks, and gradual population reduction to stay within the carrying capacities of the planet.

THE PARTY'S OVER

The central purpose of all of our *False Solution* documents, including this one, is to assert that this whole set of assumptions upon which our institutions have hung their collective hats, is tragically inaccurate, and only serves to delay, at a crucial moment, a major reckoning that must be understood immediately.

We are emphatically *not* against innovations and efficiencies where they can be helpful. But we are against the grand delusion that they can solve all problems, and we are against the tendency to ignore overarching inherent systemic limits that apply to energy supply, materials supply, and the Earth itself. For example, the grandest techno-utopian predictions at large today, such as "clean coal," via carbon sequestration, and "clean nuclear," via a new "safe 4th generation of reactor design," have already been revealed as little more than the wild fantasies of energy industries, as they peddle talking points to politicians to whom, on other days, they also supply with campaign cash. There is no persuasive evidence that clean coal, still in the realm of science fiction, will *ever* be achieved. Most likely it will occupy the same pantheon of technological fantasy as nuclear fusion, not to say human teleportation. In any case, the entire argument for clean coal, however absurd, still ignores what happens to the places from where it comes. Visit Appalachia sometime—now virtually desertified from mountain top removal, and its rivers poisoned to get at that soon-to-be "clean" coal. Clean nuclear offers similar anomalies—no currently contemplated solution for waste disposal is anywhere near practical—even if uranium supplies were not running out nearly as quickly as oil. To speak of nuclear as "clean" or "safe" is a clear sign of panic while, vampire-like, it's permitted to again rise from its grave.

Okay, we know that some technological "progress" is useful, especially among renewable energy alternatives. Systemic transformations toward a highly touted new complex mix of "renewable" energy systems such as wind, solar, hydro, biomass, wave and several others, will certainly be positive, and together they could make meaningful contributions, free of many of the negative environmental impacts that fossil fuels have brought.

But, as this report exquisitely explains, as beneficial as those shifts may be, they will inevitably fall far short. *They will never reach the scale or capacity to substitute for a fossil fuel system that, because of its (temporary) abundance and cheapness, has addicted industrial nations to a 20th century production and consumption spree that landed us, and the whole world, into this dire situation.* As Richard Heinberg has so eloquently said before, and used as the title of one his very important books, "the party's over."

So, those limitless supplies turned out not to be limitless, or cheap, (or any longer efficient), and we are left with only one real option: to face the need for a thorough systemic transformation of our entire society to one that emphasizes *less* consumption of material resources and energy (conservation), less globalization (shipping resources and products back and forth wastefully across oceans and continents), and *more* localization which has inherent efficiencies and savings from the mere fact of local production and use, and far less processing and shipping. Such changes must be combined with achieving lower population in all global sectors, and the fostering of an evolution of personal, institutional and national values that recognize (even celebrate) the ultimate limits of the earth's carrying capacities, presently being dramatically exceeded. None of that vision has infected the Copenhagen processes, nor those of the U.S. Congress, nor debates in national parliaments; anything short of that is just a self-protective, self-interested smoke screen, or, sheer denial of the realities at hand.

THE NET ENERGY FACTOR

Richard Heinberg's report makes its case by a methodical examination and *comparison* of many of the most important features inherent to the key energy systems of our time. His detailed summaries include "life cycle assessments" of the currently dominant systems such as oil, gas, coal, and nuclear —the very systems which built industrial society, and brought us to this grave historical moment. These systems are now each suffering advancing supply shortages and increased costs, making their future application dubious. Heinberg then explores and compares all the alternative systems now being

hotly promoted, like wind, solar, hydro, geothermal, biomass and biofuels, incineration, wave energy and others. He delineates ten aspects of each system, including everything from direct monetary cost (*can we afford it?*), as well as "scalability" (*will its benefits apply at a meaningful volume?*). He also includes environmental impacts in the formula; the location of the resources; their reliability (*the wind doesn't blow all the time and the sun doesn't shine*); density—how compact is the source per unit?; transportability, etc.

Most important is the tenth standard that Heinberg lists—and the bulk of this document is devoted to it: "net energy," or, the Energy Returned on Energy Invested (EROEI). Heinberg explores this revolutionary analytic terrain thoroughly, basing his reportage on the groundbreaking research of leading scientists, notably including Charles Hall of Syracuse University, who has been the pioneer explorer of the full import of "net energy" to the future of industrialism and economic growth.

What is revealed from this process is that the once great advantages of fossil fuel systems, which in their heyday were able to produce enormous quantities of cheap energy *outputs* with relatively little investment of energy *inputs* or dollar investments—Heinberg puts the EROEI ratio at about 100:1—can no longer approach that level. And, of course, they continue to ravage the planet. Meanwhile, the highly promising alternative energy systems, which in most respects are surely far cleaner than fossil fuels, cannot yield net energy ratios that are anywhere near what was possible with fossil fuels. In other words, they require for their operation a significant volume of energy *inputs* that bring their energy *outputs* to a very modest level. Too modest, actually, to be considered a sufficient substitute for the disappearing fossil fuels. In fact, as Heinberg notes, there is no combination of alternative renewables that can compete with the glory days of fossil fuels, now ending. So, what does this portend for modern society? Industrialism? Economic growth? Our current standards of living? All prior assumptions are off the table. Which way now? Systemic change will be mandatory.

Of course, there is a huge segment of the grassroots activist world that already instinctively understood all this some time ago, and has not waited for governments, separately or in collaboration with others, to do the right thing. The world is now bursting with examples on every continent of enthusiastic efforts to transform communities into locally viable and sustainable economic systems. We see a virtual renaissance of local food systems, thus replacing the supplies of the industrial agriculture machine that often ships from across thousands of miles of land or ocean. And this burgeoning movement is directly supported by a parallel movement toward re-ruralization. We also see extraordinary efforts to limit the power of global corporations operating in local contexts. There is a growing effort by communities to assert control over their own local commons; to resist privatization of public services; and to return to local production values in manufacturing and energy systems so that conservation is placed ahead of consumption. A myriad other efforts also seek to affirm local sovereignty.

Among the most exciting expressions of these tendencies has been the birth and spread of an international "Transition Towns" movement. Originally launched a few years ago in southwest England, it has helped stimulate literally thousands of similar efforts in local communities, including hundreds in the U.S. All are trying to go back to the drawing board to convert all operating systems toward active conservation efforts that minimize material and energy flow-through, protecting scarce resources, while moving toward energy and production systems that are cognizant of and reactive to an entirely alternative set of values.

So far, this is not yet threatening to the larger machines of industrialism and growth, nor to the primacy of corporate power, but time is definitely on the side of such movements. It behooves us all to align ourselves with them. In this case, it is mandatory that we build and take action at the local grassroots level, while also demanding change from our governing institutions, locally, nationally and internationally. But in any case, as the document you are about to read helps make exquisitely clear, the status quo will not survive.



GIGI CRUZ/GAIA

One hidden underbelly of a global economy, dependent on growth and consumption; this roadway runs through miles of trash and waste fields outside Manila. Similar landscapes of waste and pollution are found today in every modern country with one of the world's largest just outside New York.



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Some nations want to expand off-shore drilling, despite threats of spills to oceans, beaches, reefs, and sealife. Increased hurricane dangers from climate change make safety of these platforms ever-more doubtful, and raise chances of future Katrina-like collapses. Meanwhile, oil production also suffers overall declining rates of "net energy" and is far less viable than in its heyday. (See chapter three.)

One

OVERVIEW

THIS REPORT IS INTENDED as a non-technical examination of a basic question: *Can any combination of known energy sources successfully supply society's energy needs at least up to the year 2100?* In the end, we are left with the disturbing conclusion that *all* known energy sources are subject to strict limits of one kind or another. Conventional energy sources such as oil, gas, coal, and nuclear are either at or nearing the limits of their ability to grow in annual supply, and will dwindle as the decades proceed—but in any case they are unacceptably hazardous to the environment. And contrary to the hopes of many, there is no clear practical scenario by which we can replace the energy from today's conventional sources with sufficient energy from *alternative* sources to sustain industrial society at its present scale of operations. To achieve such a transition would require *(1)* a vast financial investment beyond society's practical abilities, *(2)* a very long time—too long in practical terms—for build-out, and *(3)* significant sacrifices in terms of energy quality and reliability.

Perhaps the most significant limit to future energy supplies is the "net energy" factor—the requirement that energy systems yield more energy than is invested in their construction and operation. There is a strong likelihood that future energy systems, both conventional and alternative, will have higher energy input costs than those that powered industrial societies during the last century. We will come back to this point repeatedly.

The report explores some of the presently proposed energy transition scenarios, showing why, up to this time, most are overly optimistic, as they do not address all of the relevant limiting factors to the expansion of alternative energy sources. Finally, it shows why energy conservation (using less energy, and also less resource materials) combined with humane, gradual population decline must become primary strategies for achieving sustainability.

* * *

The world's current energy regime is unsustainable. This is the recent, explicit conclusion of the International Energy Agency[1], and it is also the substance of a wide and growing public consensus ranging across the political spectrum. One broad segment of this consensus is concerned about the climate and the other environmental impacts of society's reliance on fossil fuels. The other is mainly troubled by questions regarding the security of future supplies of these fuels—which, as they deplete, are increasingly concentrated in only a few countries.

To say that our current energy regime is unsustainable means that it cannot continue and must therefore be replaced with something else. However, replacing the energy infrastructure of modern industrial societies will be no trivial matter. Decades have been spent building the current oil-coal-gas infrastructure, and trillions of dollars invested. Moreover, if the transition from current energy sources to

alternatives is wrongly managed, the consequences could be severe: there is an undeniable connection between per-capita levels of energy consumption and economic well-being.[3] A failure to supply sufficient energy, or energy of sufficient quality, could undermine the future welfare of humanity, while a failure to quickly make the transition away from fossil fuels could imperil the Earth's vital ecosystems.

Nonetheless, it remains a commonly held assumption that alternative energy sources capable of substituting for conventional fossil fuels are readily available—whether fossil (tar sands or oil shale), nuclear, or a long list of renewables—and ready to come on-line in a bigger way. All that is necessary, according to this view, is to invest sufficiently in them, and life will go on essentially as it is.

But is this really the case? Each energy source has highly specific characteristics. In fact, it has been the characteristics of our present energy sources (principally oil, coal, and natural gas) that have enabled the building of a modern society with high mobility, large population, and high economic growth rates. Can alternative energy sources perpetuate this kind of society? Alas, we think not.

While it is possible to point to innumerable successful alternative energy production installations within modern societies (ranging from small home-scale photovoltaic systems to large "farms" of three-megawatt wind turbines), it is not possible to point to more than a very few examples of an entire modern industrial nation obtaining the bulk of its energy from sources other than oil, coal, and natural gas. One such rare example is Sweden, which gets most of its energy from nuclear and hydropower. Another is Iceland, which benefits from unusually large domestic geothermal resources, not found in most other countries. Even in these two cases, the situation is more complex than it appears. The construction of the infrastructure for these power plants mostly relied on fossil fuels for the mining of the ores and raw materials, materials processing, transportation, manufacturing of components, the mining of uranium, construction energy, and so on. Thus for most of the world, a meaningful energy transition is still more theory than reality.

But if current primary energy sources are unsustainable, this implies a daunting problem. The transition to alternative sources *must* occur, or the world will lack sufficient energy to maintain basic services for its 6.8 billion people (and counting).

Thus it is vitally important that energy alternatives be evaluated thoroughly according to relevant criteria, and that a staged plan be formulated and funded for a systemic societal transition away from oil, coal, and natural gas and toward the alternative energy sources deemed most fully capable of supplying the kind of economic benefits we have been accustomed to from conventional fossil fuels.

By now, it is possible to assemble a bookshelf filled with reports from nonprofit environmental organizations and books from energy analysts, dating from the early 1970s to the present, all attempting to illuminate alternative energy transition pathways for the United States and the world as a whole. These plans and proposals vary in breadth and quality, and especially in their success at clearly identifying the factors that are limiting specific alternative energy sources from being able to adequately replace conventional fossil fuels.

It is a central purpose of this document to systematically review key limiting factors that are often left out of such analyses. We will begin that process in the next section. Following that, we will go further into depth on one key criterion: *net energy*, or *energy returned on energy invested* (EROEI). This measure focuses on the key question: All things considered, how much more energy does a system produce than is required to develop and operate that system? What is the ratio of energy *in* versus energy *out*? Some energy "sources" can be shown to produce little or no *net* energy. Others are only minimally positive.

Unfortunately, as we shall see in more detail below, research on EROEI continues to suffer from lack of standard measurement practices, and its use and implications remain widely misunderstood. Nevertheless, for the purposes of large-scale and long-range planning, net energy may be the most vital criterion for evaluating energy sources, as it so clearly reveals the tradeoffs involved in any shift to new energy sources.

This report is not intended to serve as a final authoritative, comprehensive analysis of available energy options, nor as a plan for a nation-wide or

global transition from fossil fuels to alternatives. While such analyses and plans are needed, they will require institutional resources and ongoing reassessment to be of value. The goal here is simply to identify and explain the primary criteria that should be used in such analyses and plans, with special emphasis on *net energy*, and to offer a cursory evaluation of currently available energy sources, using those criteria. This will provide a general, preliminary sense of whether alternative sources are up to the job of replacing fossil fuels; and if they are not, we can begin to explore what might be the fall-back strategy of governments and the other responsible institutions of modern society.

As we will see, the fundamental disturbing conclusion of the report is that there is little likelihood that either conventional fossil fuels or alternative energy sources can reliably be counted on to provide the amount and quality of energy that will be needed to sustain economic growth—or even current levels of economic activity—during the remainder of the current century.

This preliminary conclusion in turn suggests that a sensible transition energy plan will have to emphasize energy conservation above all. It also raises questions about the sustainability of growth *per se*, both in terms of human population numbers and economic activity.



As in South America, Africa's oil resources are a target for corporate giants like Shell. Indigenous communities are invaded by massive infrastructures in their forests and waters, bringing oil spills, forced removals, and military actions. In the Niger delta, where this warning sign turns away people from docks, nearly full-scale war has broken out between resisting indigenous groups, such as the Ogoni people, and global oil companies, seeking control of traditional lands.

GLOSSARY OF TERMS

CCS: Carbon Capture and Storage. When applied to coal, this still somewhat hypothetical set of technologies is often referred to as "clean coal." Many energy experts doubt that CCS can be deployed on a significant scale.

Carbon Dioxide, or CO_2: A colorless, odorless, incombustible gas, that is formed during respiration, combustion, and organic decomposition. Carbon dioxide is a minor natural constituent of Earth's atmosphere, but its abundance has increased substantially (from 280 parts per million to 387 ppm) since the beginning of the Industrial Revolution due to the burning of fossil fuels. CO_2 traps heat in Earth's atmosphere; as the concentration of the gas increases, the planet's temperature rises.

DDGS: Distillers Dried Grains with Solubles. A byproduct of producing ethanol from corn, DDGS is typically used as livestock feed.

Efficiency: The ratio between the useful *output* of an energy *conversion* machine and the *input*, in energy terms. When the useful output of conversion increases relative to input, the machine is considered more energy efficient. Typically *efficiency* applies to machines that use energy to do work (like cars or household electrical devices), or that convert energy from one form to another (like coal-burning power plants that make electricity). *Efficiency* differs from *EROEI* (see below), which typically describes the ratio between the broader energy inputs and outputs of an energy *production* system, such as a coalmine, a wind farm, or an operating oilfield. The distinction can be confusing, because sometimes both *efficiency* and *EROEI* can be applied to different aspects of the same energy system. For example, *efficiency* is used to describe the input/output of a photovoltaic solar panel (in terms of how much of the energy of sunlight is converted to electricity), while *EROEI* describes how much useful energy the panel will produce as compared to the amount of energy required to build and maintain it.

EGS: Enhanced Geothermal System. This refers to a fledgling technology that employs equipment developed by the oil and gas industry to pipe water deep below the surface, where the natural heat of Earth's crust turns it to steam that can turn a turbine.

EIA: Energy Information Administration, a branch of the U.S. Department of Energy.

Electricity: Energy made available by the flow of electric charge through a conductor.

Embodied energy: the available energy that was used in the work of making a product. This includes the activities needed to acquire natural resources, the energy used manufacturing and in making equipment and in other supporting functions—i.e., direct energy plus indirect energy.

Energy: The capacity of a physical system to do work, measured in joules or ergs. (See expanded definition, next page.)

Energy carrier: A substance (such as hydrogen) or phenomenon (such as electric current) that can be used to produce mechanical work or heat or to operate chemical or physical processes. In practical terms, this refers to a means of conveying energy from ultimate source to practical application. Our national system of electricity generating plants and power lines serves this function: it converts energy from coal, natural gas, uranium, flowing water, wind, or sunlight into a common carrier (electricity) that can be made widely available to accomplish a wide array of tasks.

EROEI: "Energy Returned on Energy Invested," also known as EROI (energy return on investment), is the ratio of the amount of usable energy acquired from a particular energy resource to the amount of energy expended to obtain that energy resource. Not to be confused with *efficiency* (see above).

Feed-in tariff: An incentive structure to encourage the adoption of renewable energy through government legislation. Regional or national electricity utilities become obligated to buy renewable electricity (from renewable sources such as solar photovoltaics, wind power, biomass, hydropower, and geothermal power) at constant, above-market rates set by the government.

Food energy: The amount of chemically stored energy present in food, usually measured in kilocalories (often written simply as "calories"). All animals require a mini-

mum periodic intake of food energy—as well as water and an array of specific nutrients (vitamins and minerals).

GHG: Greenhouse gases.

Horsepower: A unit of power originally intended to measure and compare the output of steam engines with the power output of draft horses. The definition of a horsepower unit varies in different applications (e.g., for rating boilers or electric motors); however, the most common definition, applying primarily to electric motors, is: a unit of power equal to 746 watts. Where units of horsepower are used for marketing consumer products, measurement methods are often designed by advertisers to maximize the magnitude of the number, even if it doesn't reflect the realistic capacity of the product to do work under normal conditions.

IEA: International Energy Agency. Headquartered in Paris, the IEA was created by the OECD nations after the oil shock of 1973 to monitor world energy supplies.

IGCC: Integrated Gasification Combined Cycle, an advanced type of coal power plant in which coal is brought together with water and air under high heat and pressure to produce a gas—synthesis gas (syngas), composed primarily of hydrogen and carbon monoxide—along with solid waste. It then removes impurities from the syngas before it is combusted.

IPCC: Intergovernmental Panel on Climate Change, a scientific body tasked to evaluate the risk of climate change caused by human activity. The panel was established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Program (UNEP). The IPCC shared the 2007 Nobel Peace Prize with Al Gore.

Joule: A unit of electrical energy equal to the work done when a current of one ampere passes through a resistance of one ohm for one second.

Mb/d: Millions of barrels per day.

Photovoltaic (PV): Producing a voltage when exposed to radiant energy (especially sunlight).

Net energy (sometimes referred to as Net Energy Gain or NEG): A concept used in energy economics that refers to the ratio between the energy expended to harvest an energy source and the amount of energy gained from that harvest.

Power: The rate of doing work, measured in watts (joules per second). (See Horsepower above.)

Transesterification: A process that converts animal fats or more commonly plant oils into biodiesel. In more technical terms: the reaction of a triglyceride (fat/oil) with an alcohol to form esters (a class of organic compounds formed from an organic acid and an alcohol) and glycerol (glycerine). The reaction is often catalyzed by the addition of a strong alkaline like sodium hydroxide (lye). The products of the reaction are mono-alkyl ester (biodiesel) and glycerol.

Trombe wall: A typical feature of passive solar design, a trombe wall is a very thick, south-facing wall that is painted black and made of a material that absorbs a lot of heat. A pane of glass or plastic glazing, installed a few inches in front of the wall, helps hold in the heat. The wall heats up slowly during the day. Then as it cools gradually during the night, it gives off its heat inside the building.

UCG: Underground coal gasification. Where practical, this technology could gasify coal more cheaply than above-ground IGCC power plants (gasification of coal is a stage in CCS, see above).

Watt: A unit of power equal to 1 joule per second.

Watt-hour: A unit of energy equal to the power of one watt operating for one hour.

Kilowatt (KW): Thousand watts.

KWH: Thousand watt-hours.

Megawatt (MW): Million watts.

MWH: Million watt-hours.

Gigawatt (GW): Billion watts.

GWH: Billion watt-hours.

Terawatt (TW): Trillion watts.

TWH: Trillion watt-hours.

Work: The transfer of energy from one physical system to another, especially the transfer of energy to a body by the application of a force that moves the body in the direction of the force. It is calculated as the product of the force and the distance through which the body moves and is expressed in joules, ergs, and foot-pounds.

WHAT IS "ENERGY"?

ENERGY IS OFTEN DEFINED as "the capacity of a physical system to do work," while work is said to be "force times distance traveled." But these definitions quickly become circular, as no one has seen "force" or "energy" apart from the effect that they have upon matter (which itself is difficult to define in the final analysis).

However hard it may be to define, we know that energy is the basis of everything: without it, nothing happens. Plants don't grow, cars don't move, and our homes get uncomfortably cold in the winter. Physicists may discuss energy in relation to stars and atoms, but energy is equally important to ecosystems and human economies: without sources of energy, living things die and economics grind to a halt.

Throughout history, most of the energy that humans have used has come to them in the form of food—the energy of sunlight captured and stored in plants (and in animals that eat plants). At the same time, humans have exerted energy, mostly by way of their muscles, in order to get what they wanted and needed, including food. It was essential that they harvested more food-energy than they expended in striving for it; otherwise, starvation resulted.

With animal domestication, primary energy still came by way of food, but much of that food (often of a sort that people couldn't eat) was fed to animals, whose muscles could be harnessed to pull plows, carts, and chariots.

People have also long used non-food energy by burning wood (a store of solar energy) for heat.

More recently, humans have found ways to "digest" energy that millions of years ago was chemically stored in the form of fossil fuels—"digesting" it not in their stomachs, but in the engines of machines that do work that human or animal muscles used to do; indeed, we have invented machines to do far more things than we were capable of previously, including work that human muscles could never do. Because fossil fuels represent energy stored in a more concentrated form than is found in the food we eat; because we can use fuel to power a great variety of machines; and because it has been possible to harvest fossil fuels in enormous and growing quantities, humankind has been able to build an interconnected global economy of unprecedented scope. However, fossil fuels are by their very nature finite, depleting resources. So, during recent decades enormous and increasing interest has been paid to the development of non-fossil, "alternative" energy sources.

Today, when we discuss national or global energy problems, we are mostly concerned about the energy for our machines. Most of the energy that humans use is still, in essence, solar energy—sunlight captured in food crops or forests; ancient sunlight stored in fossil fuels; sunlight heating air and fanning winds whose power can be harnessed with turbines; or sunlight transformed directly into electricity via photovoltaic panels. However, some non-solar forms of energy are also now available to us: tidal power captures the gravitational influence of the Moon and other celestial bodies; geothermal power uses Earth's heat, and nuclear power harnesses the energy given off by the decay of radioactive elements.

Even though we use more energy sources today than our ancestors did, and we use them in more ingenious and impressive ways, one vitally important principle still applies today as in the past, when our energy concerns had more directly to do with sunlight, green plants, and muscles: we must still expend energy to obtain energy, and our continued success as a species very much depends on our ability to obtain more energy from energy-harvesting efforts than we spend in those efforts.



LOU DEMATTEIS

Here's one benefit of the maze of pipelines and infrastructures driven through indigenous homelands in the Amazon; a daring new game for a young indigenous boy.



istock

The leading sources of CO_2 emissions in the U.S. are coal-fired power plants like this one. There are increased efforts to regulate major greenhouse gas polluters, and new emphases on developing so-called "clean coal" technologies of carbon capture and "sequestration" (burial). But the benefits of these measures are uncertain, and sequestration is in its infancy. As with nuclear waste, the question becomes: how long can buried coal gases stay buried? That aside, most U.S. coal now comes from mountain-top removal mining (see back cover and chapter four) which is transforming the glorious mountains of several states into waste-lands, and will never qualify as "clean." In any case, coal reserves are far lower than have been reputed, making long term viability doubtful.

Two

NINE KEY CRITERIA: COMPARING ENERGY SYSTEMS AND THEIR LIMITS

IN EVALUATING ENERGY SOURCES, it is essential first to give attention to the criteria being used. Some criteria give us good information about an energy source's usefulness for specific applications. For example, an energy source like oil shale that is a solid material at room temperature and has low energy density per unit of weight and volume is highly unlikely to be good as a transport fuel unless it can first somehow profitably be turned into a liquid fuel with higher energy density (i.e., one that contains more energy per unit of weight or volume). Other criteria gauge the potential for a specific energy source to power large segments of an entire society. Micro-hydro power, for example, can be environmentally benign, but its yield cannot be sufficiently increased in scale to provide a significant portion of the national energy budget of the U.S. or other industrial countries.

In general, it is important to identify energy sources that are capable of being scaled up to produce large quantities of energy, that have high economic utility, and that have minimal environmental impacts, particularly those impacts having to do with land use and water requirements, as well as with greenhouse gas emissions. Only sources that pass these tests are capable of becoming our future *primary* energy sources—that is, ones capably of supplying energy on the scale that fossil fuels currently do.

The economic utility and scalability of any energy source are determined by three main factors: the size of the resource base, the energy density of the resource itself, and the quantity and nature of other resources and infrastructures needed to process and employ the energy source in question.

Economist Douglas Reynolds, in a paper discussing the energy density of energy sources (which he terms "energy grade"), writes:

> Energy is the driving force behind industrial production and is indeed the driving force behind any economic activity. However, if an economy's available energy resources have low grades, i.e. low potential productivity, then new technology will not be able to stimulate economic growth as much. On the other hand, high-grade energy resources could magnify the effect of technology and create tremendous economic growth. High-grade resources [i.e., ones that have high energy density] can act as magnifiers of technology, but low-grade resources can dampen the forcefulness of new technology. This leads to the conclusion that it is important to emphasize the role of the inherent nature of resources in economic growth more fully.[1]

But economic utility is not the only test an energy source must meet. If there is anything to be learned from the ongoing and worsening climate crisis, it is that the environmental impacts of energy sources must be taken very seriously indeed. The

world cannot afford to replace oil, coal, and gas with other energy sources that might pose a survival challenge to future generations.

So here, then, are nine energy evaluation criteria. In the section following this one, we will describe a tenth, net energy.

1. Direct Monetary Cost

This is the criterion to which most attention is normally paid. Clearly, energy must be affordable and competitively priced if it is to be useful to society. However, the immediate monetary cost of energy does not always reflect its *true* cost, as some energy sources may benefit from huge hidden state subsidies, or may have externalized costs (such as grave environmental impacts that later need correction). The monetary cost of energy resources is largely determined by the other criteria listed below.

The cost of energy typically includes factors such as the costs of resource extraction and refining or other resource modification or improvement, and transport. The repayment of investment in infrastructure (factories for building solar panels; nuclear power plants; refineries; and power lines, pipelines, and tankers) must also inevitably be reflected in energy prices.

However, prices can also be skewed by subsidies or restrictions of various kinds—including tax breaks to certain kinds of energy companies, pollution regulations, government investment in energy research and development, and government investment in infrastructure that favors the use of a particular kind of energy.

2. Dependence on Additional Resources

Very few energy sources come in an immediately useable form. One such example: Without exerting effort or employing any technology we can be warmed by the sunlight that falls on our shoulders on a spring day. In contrast, most energy sources, in order to be useful, require some method of gathering, mining, or processing fuels and then converting the resulting energy. In turn this usually entails some kind of apparatus, made of some kind of additional materials (for example, oil-drilling equipment is

TABLE 1A: TODAY'S ENERGY COST

Cost of existing power generation (cents per kWh)

Coal	2 to 4
Natural gas	4 to 7
Hydropower	1
Nuclear	2.9
Wind	4.5 to 10
Biomass power	4 to 9
Solar PV	21 to 83
Geothermal	10
Solar thermal	6 to 15
Tidal	10
Wave	12

Table 1A. These are approximate costs of production for eleven energy sources. (Residential electricity consumers typically pay from $.10 to $.20 per kWh.) Source: U.S. Federal Regulatory Commission, 2007.[1]

TABLE 1B: COST OF NEW ENERGY

Cost of new energy ($/kW)

Coal	1900-5800
Natural gas	500-1500
Hydropower	NA
Nuclear	4500-7500
Wind	1300-2500
Biomass power	NA
Solar PV	3900-9000
Geothermal	2600-3500
Solar thermal	3000-5000
Tidal	NA
Wave	NA

Table 1B. "New generation" refers to the infrastructure cost of introducing the capacity to produce one kilowatt on an ongoing basis; it does not refer to the cost of the actual generated power per kilowatt hour. Source: U.S. Federal Regulatory Commission, 2007.[1]

made from steel and diamonds). And sometimes the extraction or conversion process uses additional resources (for example, the production of synthetic diesel fuel from tar sands requires enormous quantities of water and natural gas, and the production of biofuels requires large quantities of water). The amount or scarcity of the added materials or resources, and the complexity and cost of the various apparatuses required at different stages, thus constitute important limiting factors on most modes of energy production.

The requirements for ancillary resources at early stages of production, in order to yield a given quantity of energy, are eventually reflected in the price paid for the energy. But this is not always or entirely the case. For example, many thin-film photovoltaic panels incorporate materials such as gallium and indium that are non-renewable and rare, and that are being depleted quickly. While the price of thin-film PV panels reflects and includes the current market price of these materials, it does not give much indication of future limits to the scaling up of thin-film PV resulting from these materials' scarcity.

3. Environmental Impacts

Virtually all energy sources entail environmental impacts, but some have greater impacts than others. These may occur during the acquisition of the resource (in mining coal or drilling for oil, for example), or during the release of carbon energy from the resource (as in burning wood, coal, oil, or natural gas). Other impacts occur in the conversion of the energy from one form to another (as in converting the kinetic energy of flowing water into electricity via dams and hydro-turbines); or in the potential for catastrophic events, as with nuclear energy production; or in waste disposal problems. Others may be intrinsic to the production process, such as injury to forests or topsoils from various forms of biofuels production.

Some environmental impacts are indirect and subtle. They can occur during the manufacture of the equipment used in energy harvesting or conversion. For example, the extraction and manipulation of resources used in manufacturing solar panels may entail significantly more environmental damage than the operation of the panels themselves.



AMAZON WATCH

4. Renewability

If we wish our society to continue using energy at industrial rates of flow not just for years or even decades into the future, but for centuries, then we will require energy sources that can be sustained more or less indefinitely. Energy resources like oil, natural gas, and coal are clearly non-renewable because the time required to form them through natural processes is measured in the tens of millions of years, while the quantities available will only be able to power society, at best, for only a few decades into the future at current rates of use. In contrast, solar photovoltaic and solar thermal energy sources rely on sunlight, which for all practical purposes is not depleting and will presumably be available in similar quantities a thousand years hence.

It is important to repeat once again, however, that the *equipment* used to capture solar or wind energy is not itself renewable, and that scarce, depleting, non-renewable resources and significant amounts of energy may be required to manufacture much crucial equipment.



Some energy sources *are* renewable yet are still capable of being depleted. For example, wood can be harvested from forests that regenerate themselves; however, the *rate* of harvest is crucial: if over-harvested, the trees will be unable to re-grow quickly enough and the forest will shrink and disappear.

Even energy sources that are renewable and that do not suffer depletion are nevertheless limited by the size of the resource base (as will be discussed next).

5. Potential Size or Scale of Contribution

Estimating the potential contribution of an energy source is obviously essential for macro-planning purposes, but such estimates are always subject to error—which can sometimes be enormous. With fossil fuels, amounts that can be reasonably expected to be extracted and used on the basis of current extraction technologies and fuel prices are classified as *reserves*, which are always a mere fraction of *resources* (defined as the total amount of the substance present in the ground). For example, the U.S. Geological Survey's first estimate of national coal reserves, completed in 1907, identified 5000 years' worth of supplies. In the decades since, most of those "reserves" have been reclassified as "resources." Reserves are downgraded to resources when new limiting factors are taken into account, such as (in the case of coal) seam thickness and depth, chemical impurities, and location of the deposit.

Today, only 250 years' worth of useable U.S. coal supplies are officially estimated to exist—a figure that is still probably much too optimistic (as the National Academy of Sciences concluded in its 2007 report, *Coal: Research and Development to Support National Energy Policy*).

On the other hand, reserves can sometimes grow as a result of the development of new extraction technologies, as has occurred in recent years with U.S. natural gas supplies: while the production of conventional American natural gas is declining, new underground fracturing technologies have enabled the recovery of "unconventional" gas from low-porosity rock, significantly increasing the national natural gas production rate and expanding U.S. gas reserves.

The estimation of reserves is especially difficult when dealing with energy resources that have little or no extraction history. This is the case, for example, with methane hydrates, regarding which various experts have issued a very wide range of estimates of both total resources and extractable future supplies. The same is also true of oil shale, and to a lesser degree tar sands, which have limited extraction histories.

Estimating potential supplies of renewable resources such as solar and wind power is likewise problematic, as many limiting factors are often initially overlooked. With regard to solar power, for example, a cursory examination of the ultimate resource is highly encouraging: the total amount of energy absorbed by Earth's atmosphere, oceans, and land masses from sunlight annually is approximately 3,850,000 exajoules (EJ)—whereas the world's human population uses currently only about 498 EJ of energy per year from all sources combined[6], an insignificant fraction of the previous figure. However, the factors limiting the amount of sunlight that can potentially be put to work for humanity are numerous, as we will see in more detail below.

Consider the case of methane harvested from municipal landfills. In this instance, using the resource

provides an environmental benefit: methane is a more powerful greenhouse gas than carbon dioxide, so harvesting and burning landfill gas (rather than letting it diffuse into the atmosphere) reduces climate impacts while also providing a local source of energy. If landfill gas could power the U.S. electrical grid, then the nation could cease mining and burning coal. However, the potential size of the landfill gas resource is woefully insufficient to support this. Currently the nation derives about 11 billion kWh per year from landfill gas for commercial, industrial, and electric utility uses. This figure could probably be doubled if more landfills were tapped. But U.S. electricity consumers use close to 200 times as much energy as that. There is another wrinkle: If society were to become more environmentally sensitive and energy efficient, the result would be that the amount of trash going into landfills would decline—and this would reduce the amount of energy that could be harvested from future landfills.

6. Location of the Resource

The fossil fuel industry has long faced the problem of "stranded gas"—natural gas reservoirs that exist far from pipelines and that are too small to justify building pipelines to access them. Many renewable resources often face similar inconveniences and costs caused by distance.

The locations of solar and wind installations are largely dictated by the availability of the primary energy source; but often, sun and wind are most abundant in sparsely populated areas. For example, in the U.S. there is tremendous potential for the development of wind resources in Montana and North and South Dakota; however, these are three of the least-populous states in the nation. Therefore, to take full advantage of these resources it will be necessary to ship the energy to more populated regions; this will typically require building new high-capacity long distance power lines, often at great expense, and causing sometimes severe environmental impacts. There are also excellent wind resources offshore along the Atlantic and Pacific coasts, nearer to large urban centers. But taking advantage of these resources will entail building and operating turbines in deep water and connecting them to the grid onshore—not an easy task. Similarly, the nation's best solar resources are located in the Southwest, far from population centers in the Northeast.

Thus, taking full advantage of these energy resources will require more than merely the construction of wind turbines and solar panels: much of the U.S. electricity grid will need to be reconfigured, and large-capacity, long-distance transmission lines will need to be constructed. Parallel challenges exist for other countries.

7. Reliability

Some energy sources are continuous: coal can be fed into a boiler at any desired rate, as long as the coal is available. But some energy sources, such as wind and solar, are subject to rapid and unpredictable fluctuations. Wind sometimes blows at greatest intensity at night, when electricity demand is lowest. The sun shines for the fewest hours per day during the winter—but consumers are unwilling to curtail electricity usage during winter months, and power system operators are required to assure security of supply throughout the day and year.

Intermittency of energy supply can be managed to a certain extent through storage systems—in effect, batteries. However, this implies yet further infrastructure costs as well as energy losses. It also places higher demands on control technology. In the worst instance, it means building much more electricity generation capacity than would otherwise be needed.*

8. Energy Density

A. Weight (or Gravimetric) Density

This refers to the amount of energy that can be derived from a standard weight unit of an energy resource.

For example, if we use the megajoule (MJ) as a measure of energy and the kilogram (kg) as a measure of weight, coal has about 20 to 35 MJ per kg, while natural gas has about 55 MJ/kg, and oil around 42 MJ/kg. (For comparison's sake, the amount of food that a typical weight-watching

American eats throughout the day weighs a little over a kilogram and has an energy value of about 10 MJ, or 2400 kilocalories.)

However, as will be discussed in more detail below, an electric battery typically is able to store and deliver only about 0.1 to 0.5 MJ/kg, and this is why electric batteries are problematic in transport applications: they are very heavy in relation to their energy output. Thus electric cars tend to have limited driving ranges and electric aircraft (which are quite rare) are able to carry only one or two people.

Consumers and producers are willing to pay a premium for energy resources with a higher energy density by weight; therefore it makes economic sense in some instances to convert a lower-density fuel such as coal into a higher-density fuel such as synthetic diesel, even though the conversion process entails both monetary and energy costs.

B. Volume (or Volumetric) Density

This refers to the amount of energy that can be derived from a given volume unit of an energy resource (e.g., MJ per liter).

Obviously, gaseous fuels will tend to have lower volumetric energy density than solid or liquid fuels. Natural gas has about .035 MJ per liter at sea level atmospheric pressure, and 6.2 MJ/l when pressurized to 200 atmospheres. Oil, though, can deliver about 37 MJ/l.

In most instances, weight density is more important than volume density; however, for certain applications the latter can be decisive. For example, fueling airliners with hydrogen, which has high energy density by weight, would be problematic because it is a highly diffuse gas at common temperatures and surface atmospheric pressure; indeed a hydrogen airliner would require very large tanks even if the hydrogen were super-cooled and highly pressurized.

The greater ease of transporting a fuel of higher volume density is reflected in the fact that oil moved by tanker is traded globally in large quantities, while the global tanker trade in natural gas is relatively small. Consumers and producers are willing to pay a premium for energy resources of higher volumetric density.

C. Area density

This expresses how much energy can be obtained from a given land area (e.g., an acre) when the energy resource is in its original state. For example, the area energy density of wood as it grows in a forest is roughly 1 to 5 million MJ per acre. The area grade for oil is usually tens or hundreds of millions of MJ per acre where it occurs, though oilfields are much rarer than forests (except perhaps in Saudi Arabia).

Area energy density matters because energy sources that are already highly concentrated in their original form generally require less investment and effort to be put to use. Douglas Reynolds makes the point:

> If the energy content of the resource is spread out, then it costs more to obtain the energy, because a firm has to use highly mobile extraction capital [machinery], which must be smaller and so cannot enjoy increasing returns to scale. If the energy is concentrated, then it costs less to obtain because a firm can use larger-scale immobile capital that can capture increasing returns to scale.[3]

Thus energy producers will be willing to pay an extra premium for energy resources that have high area density, such as oil that will be refined into gasoline, over ones that are more widely dispersed, such as corn that is meant to be made into ethanol.

9. Transportability

The transportability of energy is largely determined by the weight and volume density of the energy resource, as discussed above. But it is also affected by the state of the source material (assuming that it is a substance)—whether it is a solid, liquid, or gas. In general, a solid fuel is less convenient to transport than a gaseous fuel, because the latter can move by pipeline (pipelines can transport eight times the volume with a doubling of the size of the pipes). Liquids are the most convenient of all because they can likewise move through hoses and pipes, and they take up less space than gases.

Some energy sources cannot be classified as solid, liquid, or gas; they are energy fluxes. The energy from sunlight or wind cannot be directly transported; it must first be converted into a form that can—such as hydrogen or electricity.

Electricity is highly transportable, as it moves through wires, enabling it to be delivered not only to nearly every building in industrialized nations, but to many locations within each building.

Transporting energy always entails costs—whether it is the cost of hauling coal (which may account for over 70 percent of the delivered price of the fuel), the cost of building and maintaining pipelines and pumping oil or gas, or the cost of building and maintaining an electricity grid. Using the grid entails costs too, since energy is lost in transmission. These costs can be expressed in monetary terms or in energy terms, and they must also be included in calculations to determine net energy gains or losses, as we will be discussing in detail in the next section.

It is arguable that net energy should simply be presented as tenth in this list of limiting energy factors. However, we believe this factor is so important as to deserve a separate discussion.

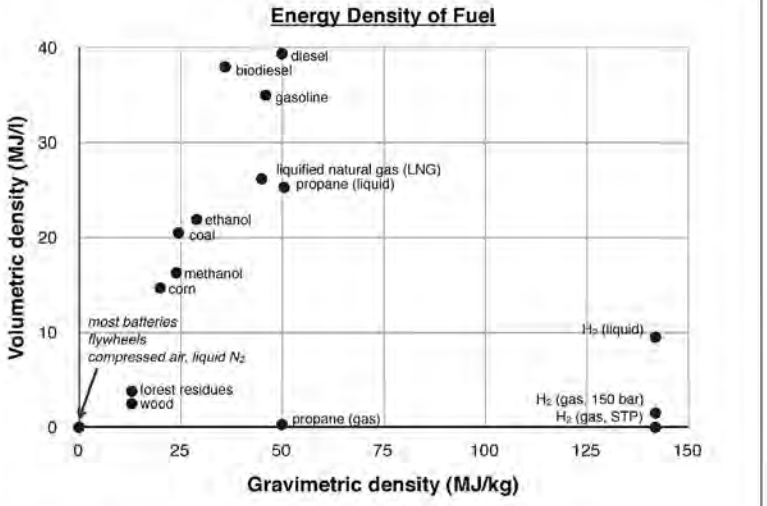

DIAGRAM 1: VOLUMETRIC AND GRAVIMETRIC DENSITY OF FUELS. *A hypothetical fuel with ideal energy density characteristics would occupy the upper right-hand corner of the diagram. Energy sources appearing in the lower left-hand corner have the worst energy density characteristics. H2 refers to hydrogen—as a super-cooled liquid, as a pressurized gas, and at "standard temperature and pressure."*



Possibly most promising among alternative renewable energies is windpower, already in wide use in northern Europe and parts of the U.S. "Net energy" for wind production tends to be higher than competitors, and potential future U.S. volume is substantial. A major problem is intermittency—wind does not always blow. Another is location and the need to cheaply transport the energy via power lines over long distances. Promising as it is, the total potential of wind, even combined with other alternative sources, remains below the level needed to sustain the present scale of industrial society. (See chapters two and three.)

Three

THE TENTH CRITERION: "*NET ENERGY*" (EROEI)

AS ALREADY MENTIONED, *net energy* refers to the ratio of the amount of energy produced to the amount of energy expended to produce it. Some energy must always be invested in order to obtain any new supplies of energy, regardless of the nature of the energy resource or the technology used to obtain it. Society relies on the net energy surplus gained from energy-harvesting efforts in order to operate all of its manufacturing, distribution, and maintenance systems.

Put slightly differently, net energy means the amount of useful energy that's left over after the amount of energy invested to drill, pipe, refine, or build infrastructure (including solar panels, wind turbines, dams, nuclear reactors, or drilling rigs) has been subtracted from the total amount of energy produced from a given source. If ten units of energy are "invested" to develop additional energy sources, then one hopes for 20 units or 50 or 100 units to result. "Energy out" must exceed "energy in," by as much as possible. Net energy is what's left over that can be employed to actually do further work. It can be thought of as the "profit" from the investment of energy resources in seeking new energy.

RETURNS ON INVESTMENTS (EROEI)

The net energy concept bears an obvious resemblance to a concept familiar to every economist or businessperson—*return on investment*, or *ROI*. Every investor knows that it takes money to make money; every business manager is keenly aware of the importance of maintaining a positive ROI; and every venture capitalist appreciates the potential profitability of a venture with a high ROI. Maintaining a positive *energy return on energy invested* (EROEI) is just as important for energy producers, and for society as a whole. (Some writers, wishing to avoid redundancy, prefer the simpler EROI; but since there is a strong likelihood for some readers to assume this means *energy returned on money invested*, we prefer the longer and more awkward term). The EROEI ratio is typically expressed as production per single unit of input, so 1 serves as the denominator of the ratio (e.g., 10/1 or 10:1). Sometimes the denominator is simply assumed, so it may be noted that the EROEI of the energy source is 10—meaning, once again, that ten units of energy are yielded for every one invested in the production process. An EROEI of less than 1—for example, .5 (which might also be written as .5/1 or .5:1) would indicate that the energy being yielded from a particular source is only half as much as the amount of energy being invested in the production process. As we will see, very low net energy returns may be expected for some recently touted new energy sources like cellulosic ethanol. And as we will also see, the net energy of formerly highly productive sources such as oil, and natural gas, which used to be more than 100:1, have steadily declined to a fraction of that ratio today.



Sometimes energy return on investment (EROEI) is discussed in terms of "energy payback time"—i.e., the amount of time required before an energy-producing system (such as an array of solar panels) will need to operate in order to produce as much energy as was expended to build and install the system. This formulation makes sense for systems (such as PV panels) that require little or nothing in the way of ongoing operational and maintenance costs once the system itself is in place.

REPLACEMENT OF HUMAN ENERGY

If we think of net energy not just as it impacts a particular energy production process, but as it impacts society as a whole, the subject takes on added importance.

When the net energy produced is a large fraction of total energy produced (for example, a net energy ratio of 100:1), this means that the great majority of the total energy produced can be used for purposes other than producing more energy. A relatively small portion of societal effort needs to be dedicated to energy production, and most of society's efforts can be directed toward activities that support a range of specialized occupations not associated with energy production. This is the situation we have become accustomed to as the result of having a century of access to cheap, abundant fossil fuels—all of which offered relatively high energy-return ratios for most of the 20th century.

On the other hand, if the net energy produced is a small fraction of total energy produced (for example a ratio of 10:1 or less), this means that a relatively large portion of available energy must be dedicated to further energy production, and only a small portion of society's available energy can be directed toward other goals. This principle applies regardless of the type of energy the society relies on—whether fossil energy or wind energy or energy in the form of food crops. For example, in a society where energy (in the form of food calories) is acquired principally through labor-intensive agriculture—which yields a low and variable energy "profit"—most of the population must be involved in farming in order to provide enough energy profit to maintain a small hierarchy of full-time managers, merchants, artists, government officials, soldiers, beggars, etc., who make up the rest of the society and who spend energy rather than producing it.

HEYDAY FOR FOSSIL FUELS

In the early decades of the fossil fuel era (the late 19th century through most of the 20th century), the quantities of both total energy *and* net energy that were liberated by mining and drilling for these fuels was unprecedented. It was this sudden abundance of cheap energy that enabled the growth of industrialization, specialization, urbanization, and globalization, which have dominated the past two centuries.

In that era it took only a trivial amount of effort in exploration, drilling, or mining to obtain an enormous energy return on energy invested (EROEI). At that time, the energy industry understandably followed the best-first or "low-hanging fruit" policy for exploration and extraction. Thus the coal, oil, and gas that were highest in quality and easiest to access tended to be found and extracted preferentially. But with every passing decade the net energy (as compared to total energy) derived from fossil fuel extraction has *declined* as energy producers have had to prospect in more inconvenient places and to rely on lower-grade resources. In the early days of the U.S. oil industry, for example, a 100-to-one energy profit ratio was common, while it is now estimated that current U.S. exploration efforts are

declining to an average one-to-one (break-even) energy payback rate[6].

In addition, as we will see in some detail later in this report, currently advocated alternatives to conventional fossil fuels generally have a much lower EROEI than coal, oil, or gas did in their respective heydays. For example, industrial ethanol production from corn is now estimated to have at best a 1.8:1 positive net energy balance[7]; it is therefore nearly useless as a primary energy source. (It is worth noting parenthetically that the calculation cited for ethanol may actually overstate the net energy gain of industrial ethanol because it includes the energy value of a production byproduct—distillers dried grains with solubles (DDGS), which can be fed to cattle—in the "energy out" column; but if the focus of the analysis is simply to assess the amount of energy used to produce one unit of corn ethanol, and the value of DDGS is thus disregarded, the EROEI is even lower, at 1.1, according to the same study.)

HOW EROEI SHAPES SOCIETY

As mentioned earlier, if the net energy profit available to society declines, a higher percentage of society's resources will have to be devoted directly to obtaining energy, thus increasing its cost. This means that less energy will be available for all of the activities that energy makes possible.

Net energy can be thought of in terms of the number of people in society that are required to engage in energy production, including food production. If energy returned exactly equals energy invested (EROEI = 1:1), then everyone must be involved in energy production activities and no one can be available to take care of society's other needs.

In pre-industrial societies, most of the energy collected was in the form of food energy, and most of the energy expended was in the form of muscle power (in the U.S., as recently as 1850, over 65 percent of all work being done was muscle-powered, versus less than 1 percent today, as fuel-fed machines do nearly all work). Nevertheless, exactly the same net-energy principle applied to these food-based energy systems as applies to our modern economy dominated by fuels, electricity, and machines. That is, people were harvesting energy from their environment (primarily in the form of food crops rather than fossil fuels), and that process itself required the investment of energy (primarily through the exertion of muscle power); success depended on the ability to produce more energy than was invested.

When most people were involved in energy production through growing or gathering food, societies were simpler by several measurable criteria: there were fewer specialized full-time occupations and fewer kinds of tools in use.

Archaeologist Lynn White once estimated that hunter-gatherer societies operated on a ten-to-one net energy basis (EROEI = 10:1).[8] In other words, for every unit of effort that early humans expended in hunting or wild plant gathering, they obtained an average of ten units of food energy in return. They used the surplus energy for all of the social activities (reproduction, child rearing, storytelling, and so on) that made life sustainable and rewarding.

Since hunter-gatherer societies are the simplest human groups in terms of technology and degree of social organization, 10:1 should probably be regarded as the minimum sustained average societal EROEI required for the maintenance of human existence (though groups of humans have no doubt survived for occasional periods, up to several years in duration, on much lower EROEI).

The higher complexity of early agrarian societies was funded not so much by increased EROEI as by higher levels of energy investment in the form of labor (farmers typically work more than hunters and gatherers) together with the introduction of food storage, slavery, animal domestication, and certain key tools such as the plow and the yoke. However, the transition to industrial society, which entails much greater levels of complexity, could only have been possible with both the higher total energy inputs, and the much higher EROEI, afforded by fossil fuels.

EROEI LIMITS ENERGY OPTIONS

Both renewable and non-renewable sources of energy are subject to the net energy principle. Fossil fuels become useless as energy sources when the energy required to extract them equals or exceeds the energy that can be derived from burning them.

This fact puts a physical limit to the portion of resources of coal, oil, or gas that should be categorized as reserves, since net energy will decline to the break-even point long before otherwise extractable fossil energy reserves are exhausted.

Therefore, the need for society to find replacements for fossil fuels may be more urgent than is generally recognized. Even though large amounts of fossil fuels remain to be extracted, the transition to alternative energy sources must be negotiated while there is still sufficient net energy available to continue powering society while at the same time providing energy for the transition process itself.



Net energy may have a direct effect on our ability to maintain industrial society at its present level. If the net energy for all combined energy sources declines, increasing constraints will be felt on economic growth, but also upon new adaptive strategies to deal with the current climate and energy crises. For example, any kind of adaptive energy transition will demand substantial new investments for the construction of more energy-efficient buildings and/or public transport infrastructure. However, such requirements will come at the same time that substantially more investment will be needed in energy production systems. Societies may simply be unable to adequately fund both sets of needs simultaneously. Noticeable symptoms of strain would include rising costs of bare necessities and a reduction in job opportunities in fields not associated with basic production. Supplying the energy required simply to maintain existing infrastructure, or to maintain aspects of that infrastructure deemed essential, would become increasingly challenging.

EROEI: DISTINCT FROM EFFICIENCY

The EROEI of energy *production* processes should not be confused with the efficiency of energy *conversion* processes, i.e., the conversion of energy from fossil fuel sources, or wind, etc., into useable electricity or useful work. Energy conversion is always less than 100 percent efficient—some energy is invariably wasted in the process (energy cannot be destroyed, but it can easily be dissipated so as to become useless for human purposes)—but conversion processes are nevertheless crucial in using energy. For example, in an energy system with many source inputs, common *energy carriers* are extremely helpful. Electricity is currently the dominant energy carrier, and serves this function well. It would be difficult for consumers to make practical use of coal, nuclear energy, and hydropower without electricity. But *conversion* of the original source energy of fossil fuels, uranium, or flowing water into electricity entails an energy cost. It is the objective of engineers to reduce that energy cost so as to make the conversion as efficient as possible. But if the energy source has desirable characteristics, even a relatively high conversion cost, in terms of "lost" energy, may be easily borne. Many coal power plants now in operation in the U.S. have an energy conversion efficiency of only 35 percent.

Similarly, some engines and motors are more efficient than others in terms of their ability to turn energy into work.

EROEI analysis does not focus on conversion efficiency *per se*, but instead takes into account all reasonable costs on the "energy invested" side of the ledger for energy *production* (such as the energy required for mining or drilling, and for the building of infrastructure), and then weighs that total against the amount of energy being delivered to accomplish work.

Because this report is a layperson's guide, we cannot address in any depth the technical process of calculating net energy.

NET ENERGY EVALUATION: IMPRECISE BUT ESSENTIAL FOR PLANNING

The use of net energy or EROEI as a criterion for evaluating energy sources has been criticized on several counts.[13] The primary criticism centers on the difficulty in establishing system boundaries that are agreeable to all interested parties, and that can easily be translated from analyzing one energy source to another. Moreover, the EROEI of some energy sources (such as wind, solar, and geothermal) may vary greatly according to the location of the resources versus their ultimate markets. Advances in the efficiency of supporting technology can also affect net energy. All of these factors make it difficult to calculate figures that can reliably be used in energy planning.

This difficulty only increases as the examination of energy production processes becomes more detailed: Does the office staff of a drilling company actually *need* to drive to the office to produce oil? Does the kind of car matter? Is the energy spent filing tax returns actually necessary to the manufacture of solar panels? While such energy costs are usually not included in EROEI analysis, some might argue that all such ancillary costs should be factored in, to get more of a full picture of the tradeoffs.[14]

Yet despite challenges in precisely accounting for the energy used in order to produce energy, net energy factors act as a real constraint in human society, regardless of whether we ignore them or pay close attention to them, because EROEI will determine if an energy source is able successfully to support a society of a certain size and level of complexity. Which alternative technologies have sufficiently high net energy ratios to help sustain industrial society as we have known it for the past century? Do any? Or does a combination of alternatives? Even though there is dispute as to exact figures, in situations where EROEI can be determined to be very low we can conclude that the energy source in question cannot be relied upon as a primary source to support an industrial economy.

Many criticisms of net energy analysis boil down to an insistence that other factors that limit the efficacy of energy sources should also be considered. We agree. For example, EROEI does not account for limits to *non-energy* inputs in energy production (such as water, soil, or the minerals and metals needed to produce equipment); it does not account for undesirable non-energy outputs of the energy production process—most notably, greenhouse gases; it does not account for energy quality (the fact, for example, that electricity is an inherently more versatile and useful energy delivery medium than the muscle power of horses); and it does not reflect the scalability of the energy source (recall the example of landfill gas above).

Energy returns *could* be calculated to include the use of non-energy inputs—e.g., Energy Return on *Water* Invested, or Energy Return on *Land* Invested. As net energy declines, the energy return from the investment of non-energy inputs is also likely to decline, perhaps even faster. For example, when fuel is derived from tar sands rather than from conventional oil fields, more land and water are needed as inputs; there is an equivalent situation when substituting biofuels for gasoline. Once society enters a single-digit average EROEI era, i.e., less than 10:1 energy output vs. input, a higher percentage of energy *and* non-energy resources (water, labor, land, and so on) will have to be devoted to energy production. This is relevant to the discussion of biofuels and similar low energy-gain technologies. At first consideration, they may seem better than fossil fuels since they are produced from renewable sources, but they use non-renewable energy inputs that have a declining net yield (as higher-quality resources are depleted). They may require large amounts of land, water, and fertilizer; and they often entail environmental damage (as fossil fuels themselves do). All proposed new sources of energy should be evaluated in a framework that considers these other factors (energy return on water, land, labor, etc.) as well as net energy.[15] Or, conceivably, a new multi-faceted EROEI could be devised.

In any case, while net energy is not the only important criterion for assessing a potential energy source, this is not a valid reason to ignore it. EROEI is a necessary—though not a complete—basis for evaluating energy sources. It is one of *five* criteria that we believe should be regarded as having make-or-break status. The other critical criteria, already

discussed in Part I. above, are: renewability, environmental impact, size of the resource, and the need for ancillary resources and materials. If a potential energy source cannot score well with all five of these criteria, it cannot realistically be considered as a future primary energy source. Stated the other way around, a potential primary energy source can be disqualified by doing very poorly with regard to just one of these five criteria.

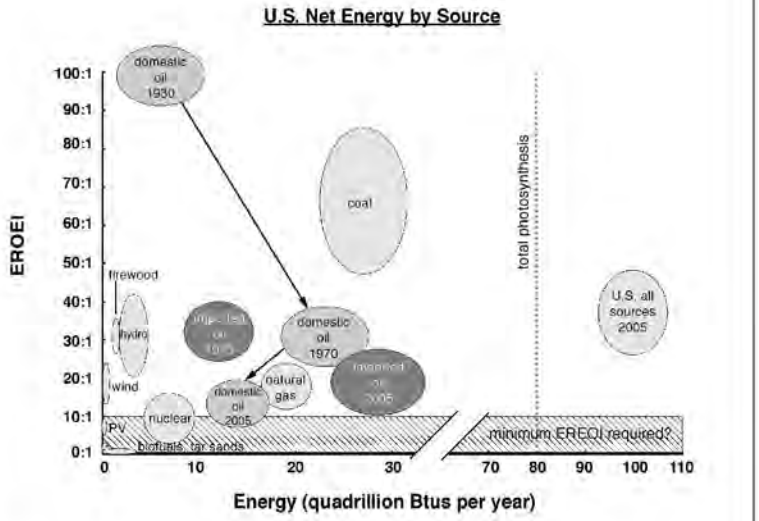

DIAGRAM 2: THE NET ENERGY (AND MAGNITUDE OF CONTRIBUTION) OF U.S. ENERGY SOURCES

This "balloon graph" of U.S. energy supplies developed by Charles Hall, Syracuse University, represents net energy (vertical axis) and quantity used (horizontal axis) of various energy sources at various times. Arrows show the evolution of domestic oil in terms of EROEI and quantity produced (in 1930, 1970, and 2005), illustrating the historic decline of EROEI for U.S. domestic oil. A similar track for imported oil is also shown. The size of each "balloon" represents the uncertainty associated with EROEI estimates. For example, natural gas has an EROEI estimated at between 10:1 and 20:1 and yields nearly 20 quadrillion Btus (or 20 exajoules). "Total photosynthesis" refers to the total amount of solar energy captured annually by all the green plants in the U.S. including forests, food crops, lawns, etc. (note that the U.S. consumed significantly more than this amount in 2005). The total amount of energy consumed in the U.S. in 2005 was about 100 quadrillion Btus, or 100 exajoules; the average EROEI for all energy provided was between 25:1 and 45:1 (with allowance for uncertainty). The shaded area at the bottom of the graph represents the estimated minimum EROEI required to sustain modern industrial society: Charles Hall suggests 5:1 as a minimum, though the figure may well be in the range of 10:1."



RODRIGO BUENDIA/AFP/GETTY IMAGES

In the Ecuadorian and Peruvian Amazon, indigenous people such as the Achuar, are routinely confronted with oil spills in rivers (such as this one), and runoffs into lakes and forests; pipelines shoved through traditional lands, oil fires, gas excursions, waste dumping, smoke, haze and other pollutants as daily occurrences, leading to very high cancer rates, and community breakdowns similar to those in the Niger delta, Indonesia and elsewhere. Achuar communities have been massively protesting, and recently successful lawsuits against Chevron and Texaco have made international headlines.



USAF ARCHIVES

This giant photovoltaic array—70,000 panels on 140 acres of Nellis Airforce base in Nevada—leads sci-fi types to fantasize much larger arrays in space, or mid-ocean, but solar comes in all sizes. Other kinds of systems include "concentrating solar thermal" and passive solar, as used in many private homes. With sunlight as the resource, planetary supply is unlimited. But, it's intermittent on cloudy days, and often seasonally, reducing its reliability as a large scale primary energy, compared to operator-controlled systems like coal, gas, or nuclear. Other limits include materials costs and shortages and relatively low "net energy" ratios.

Four

ASSESSING & COMPARING EIGHTEEN ENERGY SOURCES

IN THIS CHAPTER, we will discuss and compare in further detail key attributes, both positive and negative, of eighteen specific energy sources. The data on net energy (EROEI) for most of these are drawn largely from the work of Dr. Charles Hall, who, together with his students at the State University of New York in Syracuse, has for many years been at the forefront of developing and applying the methodology for calculating energy return ratios.[1]

We will begin by considering presently dominant energy sources, case-by-case, including oil, coal, and gas so that comparisons can be made with their potential replacements. After fossil fuels we will explore the prospects for various non-fossil sources. Altogether, eighteen energy sources are discussed in this section, listed approximately in the order of the size of their current contribution to world energy supply.

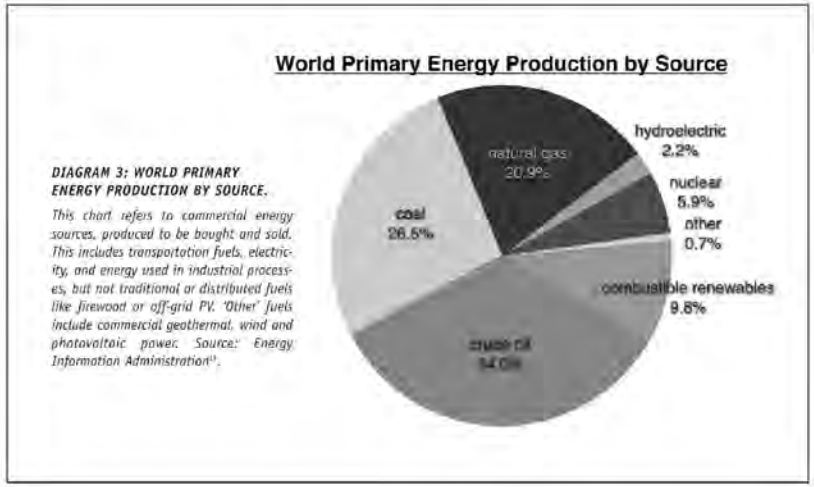

DIAGRAM 3: WORLD PRIMARY ENERGY PRODUCTION BY SOURCE.

This chart refers to commercial energy sources, produced to be bought and sold. This includes transportation fuels, electricity, and energy used in industrial processes, but not traditional or distributed fuels like firewood or off-grid PV. 'Other' fuels include commercial geothermal, wind and photovoltaic power. Source: Energy Information Administration[2].

1. OIL



WALTER BIBIKOW/AGE FOTOSTOCK

As the world's current largest energy source, oil fuels nearly all global transportation—cars, planes, trains, and ships. (The exceptions, such as electric cars, subways and trains, and sailing ships, make up a statistically insignificant portion of all transport). Petroleum provides about 34 percent of total world energy, or about 181 EJ per year. The world currently uses about 75 million barrels of crude oil per day, or 27 billion barrels per year[17], and reserves amount to about one trillion barrels (though the figure is disputed).

PLUS: Petroleum has become so widely relied upon because of several of its most basic characteristics: It is highly transportable as a liquid at room temperature and is easily stored. And it is energy dense—a liter of oil packs 38 MJ of chemical energy, as much energy as is expended by a person working two weeks of 10-hour days.[20]

Historically, oil has been cheap to produce, and can be procured from a very small land footprint.

MINUS: Oil's downsides are as plain as its advantages.

Its negative environmental impacts are massive. Extraction is especially damaging in poorer nations such as Ecuador, Peru, and Nigeria, where the industry tends to spend minimally on the kinds of remediation efforts that are required by law in the U.S.; as a result, rivers and wetlands are poisoned, air is polluted, and indigenous people see their ways of life devastated.

Meanwhile, burning oil releases climate-changing carbon dioxide (about 800 to 1000 lbs of CO_2 per barrel[21], or 70 kg of CO_2 per GJ), as well as other pollutants such as nitrogen oxides and particulates.

Most importantly, oil is non-renewable, and many of the world's largest oilfields are already significantly depleted. Most oil-producing nations are seeing declining rates of extraction, and future sources of the fuel are increasingly concentrated in just a few countries—principally, the members of the Organization of Petroleum Exporting Countries (OPEC). The geographic scarcity of oil deposits has led to competition for supplies, and sometimes to war over access to the resource. As oil becomes scarcer due to depletion, we can anticipate even worse oil wars.[22]

EROEI: The net energy (compared to gross energy) from global oil production is difficult to ascertain precisely, because many of the major producing nations do not readily divulge statistics that would make detailed calculations possible. About 750 joules of energy are required to lift 15 kg of oil 5 meters—an absolute minimum energy investment for pumping oil that no longer simply flows out of the ground under pressure (though much of the world's oil still does). But energy is also expended in exploration, drilling, refining, and so on. An approximate total number can be derived by dividing the energy produced by the global oil industry by *the energy equivalent of the dollars spent* by the oil industry for exploration and production (this is a rough calculation of the amount of energy used in the economy to produce a dollar's worth of goods and services). According to Charles Hall, this number—for oil and gas together—was about 23:1 in 1992, increased to about 32:1 in 1999, and has since declined steadily, reaching 19:1 in 2005. If the recent trajectory is projected forward, the EROEI for global oil and gas would decline to 10:1 soon after 2010. Hall and associates find that for the U.S. (a nation whose oil industry investments and oil production statistics are fairly transparent), EROEI at the wellhead was roughly 26:1 in 1992, increased to 35:1 in 1999, and then declined to 18:1 in 2006.[23]

It is important to remember that Hall's 19:1 estimate for the world as a whole is an average: some producers enjoy much higher net energy gains than others. There are good reasons to assume that most of the high-EROEI oil producers are OPEC-member nations.

PROSPECTS: As mentioned, oil production is in decline in most producing countries, and nearly all the world's largest oilfields are seeing falling production. The all-time peak of global oil production probably occurred in July, 2008 at 75 million barrels per day.[24] At the time, the per-barrel price had skyrocketed to its all-time high of $147. Since then, declining demand and falling price have led producing nations to cut back on pumping. Declining price has also led to a significant slowing of investment in exploration and production, which virtually guarantees production shortfalls in the future. It therefore seems unlikely that the July 2008 rate of production will ever be exceeded.

Declining EROEI and limits to global oil production will therefore constrain future world economic activity unless alternatives to oil can be found and brought on line extremely rapidly.

2. COAL



The Industrial Revolution was largely made possible by energy from coal. In addition to being the primary fuel for expanding manufacturing, it was also used for space heating and cooking. Today, most coal is burned for the production of electricity and for making steel.

Coal has been the fastest-growing energy source (by quantity) in recent years due to prodigious consumption growth in China, which is by far the world's foremost producer and user of the fuel. The world's principal coal deposits are located in the U.S., Russia, India, China, Australia, and South Africa. World coal reserves are estimated at 850 billion metric tons (though this figure is disputed), with annual production running at just over four billion tons. Coal produces 134.6 EJ annually, or 27 percent of total world energy. The U.S. relies on coal for 49 percent of its electricity and 23 percent of total energy.[25]

Coal's energy density by weight is highly variable (from 30 MJ/kg for high-quality anthracite to as little as 5.5 MJ/kg for lignite).

PLUS: Coal currently is a cheap, reliable fuel for the production of electricity. It is easily stored, though bulky. It is transportable by train and ship (transport by truck for long distances is rarely feasible from an energy and economic point of view).

MINUS: Coal has the worst environmental impacts of any of the conventional fossil fuels, both in the process of obtaining the fuel (mining) and in that of burning it to release energy. Because coal is the most carbon-intensive of the conventional fossil fuels (94 kg of CO_2 are emitted for every GJ of energy produced), it is the primary source of greenhouse gas emissions leading to climate change, even though it contributes less energy to the world economy than petroleum does.

Coal is non-renewable, and some nations (U.K. and Germany) have already used up most of their original coal reserves. Even the U.S., the "Saudi Arabia of coal," is seeing declining production from its highest-quality deposits.

EROEI: In the early 20th century, the net energy from U.S. coal was very high, at an average of 177:1 according to one study[26], but it has fallen substantially to a range of 50:1 to 85:1. Moreover, the decline is continuing, with one estimate suggesting that by 2040 the EROEI for U.S. coal will be 0.5:1[27].

PROSPECTS: While official reserves figures imply that world coal supplies will be sufficient for a century or more, recent studies suggest that supply limits may appear globally, and especially regionally, much sooner. According to a 2007 study by Energy Watch Group of Germany, world coal production is likely to peak around 2025 or 2030, with a gradual decline thereafter. China's production peak could come sooner if economic growth (and hence energy demand growth) returns soon. For the U.S., coal production may peak in the period 2030 to 2035.

New coal technologies such as carbon capture and storage (CCS) could theoretically reduce the climate impact of coal, but at a significant economic and energy cost (by one estimate, up to 40 percent of the energy from coal would go toward mitigating climate impact, with the other 60 percent being available for economically useful work; there would also be an environmental cost from damage due to additional mining required to produce the extra coal needed to make up for the energy costs from CCS).[28]

Coal prices increased substantially in 2007–2008 as the global economy heated up, which suggests that the existing global coal supply system was then near its limit. Prices have declined sharply since then as a result of the world economic crisis and falling energy demand. However, prices for coal will almost certainly increase in the future, in inflation- or deflation-adjusted terms, as high-quality deposits are exhausted and when energy demand recovers from its lowered level due to the current recession.

3. NATURAL GAS



GAS FLARE AT NATURAL GAS PLANT STOCK

Formed by geological processes similar to those that produced oil, natural gas often occurs together with liquid petroleum. In the early years of the oil industry, gas was simply flared (burned at the wellhead); today, it is regarded as a valuable energy resource and is used globally for space heating and cooking; it also has many industrial uses where high temperatures are needed, and it is increasingly burned to generate electricity. Of the world's total energy, natural gas supplies 25 percent; global reserves amount to about 6300 trillion cubic feet, which represents an amount of energy equivalent to 890 billion barrels of oil.[29]

PLUS: Natural gas is the least carbon-intensive of the fossil fuels (about 53 kg CO_2 per GJ). Like oil, natural gas is energy dense (more so by weight than by volume), and is extracted from a small land footprint. It is easily transported through systems of pipelines and pumps, though it cannot be transported by ship as conveniently as oil, as this typically requires pressurization at very low temperatures.

MINUS: Natural gas is a hydrocarbon fuel, which means that burning it releases CO_2 even if the amounts are less than would be the case to yield a similar amount of energy from coal or oil. Like oil, natural gas is non-renewable and depleting. Environmental impacts from the production of natural gas are similar to those with oil. Recent disputes between Russia, Ukraine, and Europe over Russian natural gas supplies underscore the increasing geopolitical competition for access to this valuable resource. International transport and trade of liquefied natural gas (LNG) entails siting and building offloading terminals that can be extremely hazardous.

EROEI: The net energy of global natural gas is even more difficult to calculate than that of oil, because oil and gas statistics are often aggregated. A recent study that incorporates both direct energy (diesel fuel used in drilling and completing a well) and indirect energy (used to produce materials like steel and cement consumed in the drilling process) found that as of 2005, the EROEI for U.S. gas fields was 10:1.[30] However, newer "unconventional" natural gas extraction technologies (coal-bed methane and production from low-porosity reservoirs using "fracing" technology) probably have significantly lower net energy yields: the technology itself is more energy-intensive to produce and use, and the wells deplete quickly, thus requiring increased drilling rates to yield equivalent amounts of gas. Thus as conventional gas depletes and unconventional gas makes up a greater share of total production, the EROEI of natural gas production in North America will decline, possibly dramatically.

PROSPECTS: During the past few years, North America has averted a natural gas supply

crisis as a result of the deployment of new production technologies, but it is unclear how long the reprieve will last given the (presumably) low EROEI of these production techniques and the fact that the best unconventional deposits, such as the Barnett shales of Texas, are being exploited first. European gas production is declining and Europe's reliance on Russian gas is increasing—but it is difficult to tell how long Russia can maintain current flow rates.

In short, while natural gas has fewer environmental impacts than the other fossil fuels, especially coal, its future is clouded by supply issues and declining EROEI.

4. HYDROPOWER



Hydropower is electric current produced from the kinetic energy of flowing water. Water's gravitational energy is relatively easily captured, and relatively easily stored behind a dam. Hydro projects may be enormous (as with China's Three Gorges Dam) or very small ("microhydro") in scale. Large projects typically involve a dam, a reservoir, tunnels, and turbines; small-scale projects usually simply employ the "run of the river," harnessing energy from a river's natural flow, without water storage.

Hydropower currently provides 2,894 Terawatt hours (TWh) of electricity annually worldwide, and about 264 TWh in the U.S.; of all *electrical* energy, hydropower supplies 19 percent worldwide (with 15 percent coming from large hydropower), and 6.5 percent in the U.S. This represents 6 percent of total energy globally and 3 percent nationally.[3]

PLUS: Unlike fossil energy sources, with hydropower most energy and financial investment occurs during project construction, while very little is required for maintenance and operations. Therefore electricity from hydro is generally cheaper than electricity from other sources, which may cost two to three times as much to generate.

MINUS: Energy analysts and environmentalists are divided on the environmental impacts of hydropower. Proponents of hydropower see it as a clean, renewable source of energy with only moderate environmental or social impacts. Detractors of hydropower see it as having environmental impacts as large as, or larger than, those of some conventional fossil fuels. Global impacts include carbon emissions primarily during dam and reservoir construction and methane releases from the drowned vegetation. Regional impacts result from reservoir creation, dam construction, water quality changes, and destruction of native habitat. The amount of carbon emissions produced is very site-specific and substantially lower than from fossil fuel sources. Much of the debate about hydropower centers on its effects on society, and whether or not a constant supply of water for power, irrigation, or drinking justifies the occasional requirement to relocate millions of people. Altogether, large dam and reservoir construction projects have required relocations of about 40 to 80 million people during the last century. Dam failure or collapse is also a risk in some cases, especially in China.

EROEI: Hydropower's EROEI ranges roughly from 11.2:1 to 267:1, varying enormously by site. Because hydropower is such a variable resource, used in many different geographical conditions and involving various technologies, one generalized EROEI ratio cannot describe all projects. The EROEI for favorable or even moderate sites can be extremely high, even where environmental and social impacts are severe.

PROSPECTS: Globally, there are many undeveloped dam sites with hydropower potential, though there are few in the U.S., where most of the best sites have already been developed. Theoretically, hydropower could be accessible at some level to any population near a constant supply of flowing water.

The International Hydropower Association estimates that about one-third of the realistic potential of world hydropower has been developed. In practice, the low direct investment cost of fossil fuels, combined with the environmental and social consequences of dams, have meant that fossil fuel-powered projects are much more common.

Dams have the potential to produce a moderate amount of additional, high-quality electricity in less-industrialized countries, but continue to be associated with extremely high environmental and social costs. Many authors see "run-of-river" hydropower (in which dams are not constructed) as the alternative future, because this does away with the need for massive relocation projects, minimizes the impacts on fish and wildlife, and does not release greenhouse gases (because there is generally no reservoir), while it retains the benefits of a clean, renewable, cheap source of energy. However, the relatively low power density of this approach limits its potential.

5. NUCLEAR

Electricity from controlled nuclear fission reactions has long been a highly contentious source of energy. Currently, 439 commercial power-generating reactors are operating worldwide, 104 of them in the U.S. Collectively they produced 2,658 TWh world-wide in 2006, and 806 TWh in the U.S. This represents about 6 percent of world energy, 8 percent of all energy consumed in the U.S., and 19 percent of U.S. electricity.[12]

All commercial reactors in the U.S. are variants of light water reactors. Other designs continue to be subjects of research.

PLUS: Nuclear electricity is reliable and relatively cheap (with an average generating cost of 2.9 cents per kW/h) once the reactor is in place and operating. In the U.S., while no new nuclear power plants have been built in many years, the amount of nuclear electricity provided has grown during the past decade due to the increased efficiency and reliability of existing reactors.

The nuclear cycle emits much less CO_2 than the burning of coal to produce an equivalent amount of energy (though it is important to add that uranium mining and enrichment, and plant construction, still entail considerable carbon emissions). This reduced CO_2 emission rate has led some climate protection spokespeople to favor nuclear power, at least as a temporary bridge to an "all-renewable" energy future.

MINUS: Uranium, the fuel for the nuclear cycle, is a *not* a renewable resource. The peak of world uranium production is likely to occur between 2040 and 2050[13], which means that nuclear fuel is likely to become more scarce and expensive during the next few decades. Already, the average grade of uranium ore mined has declined substantially in recent years as the best reserves have been depleted. Recycling of fuel and the employment of alternative nuclear fuels are possible, but the needed technology has not been adequately developed.

Nuclear power plants are extremely costly to build, so much so that unsubsidized nuclear plants are not economically competitive with similar-sized fossil-fuel plants. Government subsidies in the U.S. include: *(1)* those from the military nuclear industry, *(2)* non-military government subsidies, and *(3)* artificially low insurance costs. New power plants also typically entail many years of delay for design, financing, permitting, and construction.

The nuclear fuel cycle also brings substantial environmental impacts, which may be even greater during the mining and processing stages than during plant operation even when radiation-releasing accidents are taken into account. Mining entails ecosystem removal, the release of dust, the production of large amounts of tailings (equivalent to 100 to 1,000 times the quantity of uranium extracted), and the leaching of radiation-emitting particles into groundwater. During plant operation, accidents causing small to large releases of radiation can impact the local environment or much larger geographic areas, potentially making land uninhabitable (as occurred with the explosion and radiation leakage in the Chernobyl reactor in the former Soviet Union in 1986).

Storage of radioactive waste is also highly problematic. High-level waste (like spent fuel) is much more radioactive and difficult to deal with than low-level waste, and must be stored onsite for several years before transferal to a geological repository.

So far, the best-known way to deal with waste, which contains doses of radiation lethal for thou-

sands of years, is to store it in a geological repository, deep underground. The long-proposed site at Yucca Mountain in Nevada, the only site that has been investigated as a repository in the U.S., has recently been canceled. Even if the Yucca Mountain site had gone ahead, it would not have been sufficient to store the U.S. waste already awaiting permanent storage. More candidate repository sites will need to be identified soon if the use of nuclear power is to be expanded in the U.S. Even in the case of ideal sites, over thousands of years waste could leak into the water table. The issue is controversial even after extremely expensive and extensive analyses by the Department of Energy.

Nearly all commercial reactors use water as a coolant. As water cools the reactor, the water itself becomes warmed. When heated water is then discharged back into lakes, rivers, or oceans the resultant heat pollution can disrupt aquatic habitats.

During the 2003 heat wave in France, several nuclear plants were shut because the river water was too hot. And in recent years, a few reactors have had to be shut down due to water shortages, highlighting a future vulnerability of this technology in a world where over-use of water and extreme droughts from climate change are becoming more common.

Reactors must not be sited in earthquake-prone regions due to the potential for catastrophic radiation release in the event of a serious quake. Nuclear reactors are often cited as potential terrorist targets and as potential sources of radioactive materials for the production of terrorist "dirty bombs."

EROEI: A review by Charles Hall *et al.*[4] of net energy studies of nuclear power that have been published to date found the information to be "idiosyncratic, prejudiced, and poorly documented." The largest issue is determining what the appropriate boundaries of analysis should be. The review concluded that the most reliable EROEI information is quite old (showing results in the range of 5 to 8:1), while newer information is either highly optimistic (15:1 or more) or pessimistic (low, even less than 1:1). An early study cited by Hall indicated that the high energy inputs during the construction phase are one of the major reasons for the low EROEI—which also means there are substantial greenhouse gas (GHG) emissions during construction.



NUCLEAR WASTE STORAGE FACILITY, YUCCA MT., NEVADA. JOHN/AZROU/GETTY IMAGES

PROSPECTS: The nuclear power industry is set to grow, with ten to twenty new power plants being considered in the U.S. alone. But the scale of growth is likely to be constrained mostly for reasons discussed above.

Hopes for a large-scale deployment of new nuclear plants rest on the development of new technologies: pebble-bed and modular reactors, fuel recycling, and the use of thorium as a fuel. The ultimate technological breakthrough for nuclear power would be the development of a commercial fusion reactor. However, each of these new technologies is problematic for some reason. Fusion is still decades away and will require much costly research. The technology to extract useful energy from thorium is highly promising, but will require many years and expensive research and development to commercialize. The only breeder reactors in existence are either closed, soon to be closed, abandoned, or awaiting re-opening after serious accidents. Examples of problematic breeders include BN-600 (in Russia, which will end its life by 2010); Clinch River Breeder Reactor (in the U.S., construction abandoned in 1982 because the U.S. halted its spent-fuel reprocessing program thus making breeders pointless); Monju (in Japan, being brought online

again after a serious sodium leak and fire in 1995); and Superphénix (in France, closed in 1998). Therefore, realistically, nuclear power plants constructed in the short and medium term can only be incrementally different from current designs.

In order for the nuclear industry to grow sufficiently so as to replace a significant portion of energy now derived from fossil fuels, scores if not hundreds of new plants would be required, and soon. Given the expense, long lead-time entailed in plant construction, and safety issues, the industry may do well merely to build enough new plants to replace old ones that are nearing their retirement and decommissioning.

Hall *et al.* end their review of nuclear power by stating: "In our opinion we need a very high-level series of analyses to review all of these issues. Even if this is done, it seems extremely likely that very strong opinions, both positive and negative, shall remain. There may be no resolution to the nuclear question that will be politically viable."

6. BIOMASS



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Consisting of wood and other kinds of plant materials, as well as animal dung, various forms of biomass still account annually for about 13 percent of the world's total energy consumption and are used by up to 3 billion people for cooking and heating.[35] (Note: Most official comparative tallies of energy from various sources, such as those from the IEA and EIA, omit the contribution of "traditional" or noncommercial biomass usage; since these official sources are cited repeatedly herein, the careful reader will find that adding the 13 percent contribution of biomass to the percentage figures for other energy sources yields a total that is greater than 100 percent. The only remedy for this in the present text would have been the re-calculation of statistics from the official sources, but that would merely have added a different potential source of confusion.)

Nontraditional "new" forms of biomass usage generally involve converting wood, crops, manures, or agricultural "waste" products into liquid or gaseous fuel (see ethanol and biodiesel, below), using it to generate electricity, or using it to cogenerate heat and electricity. World electric power generation from biomass was about 183 TWh in 2005 from an installed capacity of 40 GW, with 27 percent of this coming from biogas and municipal solid waste.[36]

Wood fuels presently account for 60 percent of global forest production (most of the remaining 40 percent is used for building materials and paper) and, along with agricultural residues (such as straw), contribute 220 GWh for cooking and heating energy. Forests are a huge renewable resource, covering 7 percent of the Earth's surface, but net deforestation is occurring around the globe, especially in South America, Indonesia, and Africa.[37] Deforestation is caused mostly by commercial logging and clearing of land for large-scale agriculture, *not* by traditional wood gathering, which is often sustainably practiced. However, in many areas wood use and population pressure are leading to deforestation and even desertification.

Cogeneration or Combined Heat and Power (CHP) plants can burn fossil fuels or biomass to make electricity and are configured so that the heat from this process is not wasted but used for space or water heating. Biomass CHP is more efficient at producing heat than electricity, but can be practical on both counts if there is a local source of excess biomass and a community or industrial demand nearby for heat and electricity. Biomass plants are being built in the U.S., in northern Europe, and also in Brazil (where they are associated with the sugar processing industry). The rate of growth of biopower has been around 5 percent per year over the last decade.[38] Biomass power plants are only half as efficient as natural gas plants and are limited in

size by a fuelshed of around 100 miles, but they provide rural jobs and reliable base-load power (though in temperate climates biomass availability is seasonal, and biomass storage is particularly inefficient with high rates of loss).[39]

Biomass conversion technologies (as opposed to direct use via burning) can be divided into three categories. *Biochemical* methods use fermentation and decomposition to create alcohols (primarily ethanol) and landfill gas. Oil extracted from plants, animals or algae can be converted *chemically* into biodiesel. In *thermochemical* processes, biomass is heated (pyrolized) and broken down into carbon and flammable syngases or bio-oil (depending on the speed and temperature of pyrolysis and the feedstock). Bio-oil can be used like fuel oil or refined into biodiesel, while syngas has properties similar to natural gas. There is growing interest in using thermochemical processes to make biofuels, since the leftover carbon (called biochar) can be added to farm fields to improve soil fertility and sequester carbon.[40]

The biochemical process of decay in the absence of oxygen produces biogas, which occurs naturally in places where anaerobic decay is concentrated, like swamps, landfills, or cows' digestive systems. Industrial manufacture of biogas uses bacteria to ferment or anaerobically digest biodegradable material, producing a combustible mixture consisting of 50 to 75 percent methane plus other gases.[41] Biogas can be used like natural gas and burned as fuel in anything from a small cookstove to an electricity plant. Small-scale biogas is utilized all over the world, both in households and for industry.

Biogas can be produced on an industrial scale from waste materials, but it is difficult to find estimates of the possible size of this resource. The National Grid in the U.K. has suggested that waste methane can be collected, cleaned and added to the existing U.K. natural gas pipeline system. That agency estimates that if all the country's sewage, food, agriculture and manufacturing biowastes were used, half of all U.K. residential gas needs could be met. Burning biogas for heat and cooking offers 90 percent energy conversion efficiency, while using biogas to generate electricity is only 30 percent efficient.[42]

PLUS: Biomass is distributed widely where people live. This makes it well suited for use in small-scale, region-appropriate applications where using local biomass is sustainable. In Europe there has been steady growth in biomass CHP plants in which scrap materials from wood processing or agriculture are burned, while in developing countries CHP plants are often run on coconut or rice husks. In California, dairy farms are using methane from cow manure to run their operations. Biogas is used extensively in China for industry, and 25 million households worldwide use biogas for cooking and lighting.[43]

Burning biomass and biogas is considered to be carbon neutral, since unlike fossil fuels these operate within the biospheric carbon cycle. Biomass contains carbon that would ordinarily be released naturally by decomposition or burning to the atmosphere over a short period of time. Using waste sources of biogas like cow manure or landfill gas reduces emissions of methane, a greenhouse gas twenty-three times more potent than carbon dioxide.

MINUS: Biomass is a renewable resource but not a particularly expandable one. Often, available biomass is a waste product of other human activities, such as crop residues from agriculture, wood chips, sawdust and black liquor from wood products industries, and solid waste from municipal trash and sewage. In a less energy-intensive agricultural system, such as may be required globally in the future, crop residues may be needed to replenish soil fertility and will no longer be available for power generation. There may also be more competition for waste products in the future, as manufacturing from recycled materials increases.

Using biomass for cooking food has contributed to deforestation in many parts of the world and it is associated with poor health and shortened lifespans, especially for women who cook with wood or charcoal in unvented spaces. Finding a substitute fuel or increasing the efficiency of cooking with wood is the goal of programs in India, China and Africa.[44] In order to reduce greenhouse gas emissions, it is probably more desirable to re-forest than to use wood as fuel.

EROEI: Energy return estimates for biomass are extremely variable. Biomass is generally more

efficiently used for heat than for electricity, but electricity generation from biomass can be energetically favorable in some instances. Biogas is usually made from waste materials and utilizes decomposition, which is a low energy-input process, so it is inherently efficient. Regarding the EROEI of ethanol and biodiesel, see below.

PROSPECTS: Wood, charcoal, and agricultural residues will almost certainly continue to be used around the world for cooking and heating. There is a declining amount of biomass-derived materials entering the waste stream because of increased recycling, so the prospect of expanding landfill methane capture is declining. Use of other kinds of biogas is a potential growth area. Policies that support biogas expansion exist in India and especially in China, where there is a target of increasing the number of household-scale biogas digesters from an estimated 1 million in 2006 to 45 million by 2020.

7. WIND POWER



TRADITIONAL WINDMILL IN THE NETHERLANDS / DREAMS

One of the fastest-growing energy sources in the world, wind power generation expanded more than five-fold between 2000 and 2007. However, it still accounts for less than 1 percent of the world's electricity generation, and much less than 1 percent of total energy. In the U.S., total production currently amounts to 32Twh, which is 0.77 percent of total electricity supplied, or 0.4 percent of total energy.

Of all new electricity generation capacity installed in the U.S. during 2007 (over 5,200 MW), more than 35 percent came from wind. U.S. wind energy production has doubled in just two years. In September 2008, the U.S. surpassed Germany to become the world leader in wind energy production, with more than 25,000 MW of total generating capacity. [16] (Note: In discussing wind power, it is important to distinguish between nameplate production capacity—the amount of power that theoretically could be generated at full utilization—and the actual power produced: the former number is always much larger, because winds are intermittent and variable.)

Wind turbine technology has advanced in recent years, with the capacity of the largest turbines growing from 1 MW in 1999 to up to 5 MW today. The nations currently leading in installed wind generation capacity are the United States, Germany, Spain, India, and China. Wind power currently accounts for about 19 percent of electricity produced in Denmark, 9 percent in Spain and Portugal, and 6 percent in Germany and the Republic of Ireland. In 2007-2008 wind became the fastest-growing energy source in Europe, in quantitative as well as percentage terms.

PLUS: Wind power is a renewable source of energy, and there is enormous potential for growth in wind generation: it has been estimated that developing 20 percent of the world's wind-rich sites would produce seven times the current world electricity demand. [17] The cost of electricity from wind power, which is relatively low, has been declining further in recent years. In the U.S. as of 2006, the cost per unit of energy production capacity was estimated to be comparable to the cost of new generating capacity for coal and natural gas: wind cost was estimated at $55.80 per MWh, coal at $53.10/MWh, and natural gas at $52.30 (however, once again it is important with wind power to stress the difference between nameplate production capacity and actual energy produced). [17]

MINUS: The uncontrolled, intermittent nature of wind reduces its value when compared to operator-controlled energy sources such as coal, gas, or nuclear power. For example, during January 2009 a high pressure system over Britain resulted in very low wind speeds combined with unusually low temperatures (and therefore higher than normal electricity demand). The only way for utility operators to prepare for such a situation is to build extra

generation capacity from other energy sources. Therefore, adding new wind generating capacity often does not substantially decrease the need for coal, gas, or nuclear power plants; it merely enables those conventional power plants to be used less while the wind is blowing. However, this creates the need for load-balancing grid control systems.

Another major problem for wind generation is that the resource base is often in remote locations. Getting the electricity from the local point-of-generation to a potentially distant load center can be costly. The remoteness of the wind resource base also leads to increased costs for development in the case of land with difficult terrain or that is far from transportation infrastructure.

Being spread out over a significant land area, wind plants must compete with alternative development ideas for these land resources, especially where multiple simultaneous usages are impossible.

The dramatic cost reductions in the manufacture of new wind turbines over the past two decades may slow as efficiencies are maximized and as materials costs increase.

Though wind turbines have been generally accepted by most communities, there has been concern about "visual pollution" and the turbines' danger to birds.

EROEI: The average EROEI from all studies worldwide (operational and conceptual) was 24.6:1. The average EROEI from just the operational studies is 18.1:1. This compares favorably with conventional power generation technologies.[8]

In the U.S., existing wind power has a high EROEI (18:1), though problems with electricity storage may reduce this figure substantially as generating capacity grows. EROEI generally increases with the power rating of the turbine, because *(1)* smaller turbines represent older, less efficient technologies; *(2)* larger turbines have a greater rotor diameter and swept area, which is the most important determinant of a turbine's potential to generate power; and *(3)* since the power available from wind increases by the cube of an increase in the wind speed, and larger turbines can extract energy from winds at greater heights, wind speed and thus EROEI increase quickly with the height of the turbine.

The net energy ratio for wind power can range widely depending on the location of a turbine's manufacture and installation, due to differences in the energy used for transportation of manufactured turbines between countries, the countries' economic and energy structure, and recycling policies. For example, production and operation of an E-40 turbine in coastal Germany requires 1.39 times more energy than in Brazil. The EROEI for sea-based turbines is likely to be lower due to maintenance needs resulting from the corrosive effects of sea spray.

PROSPECTS: Wind is already a competitive source of power. For structural reasons (its long-term cost of production is set by financing terms upon construction and does not vary in the short term), wind benefits from *feed-in tariffs* to protect it from short-term electricity price fluctuations; but overall it will be one of the cheapest sources of power as fossil fuels dwindle—and one with a price guaranteed not to increase over time. In the E.U. its penetration is already reaching 10 to 25 percent in several nations; prospects in the U.S. are in some ways better, as growth is not limited by the geographical constraints and population density found in Europe (with more land covered by cities, that leaves fewer good sites for turbines).

Intermittency can be dealt with to some extent, as the European experience shows, by a combination of smart grid management and infrequent use of the existing fossil-fuel-fired capacity; even though a large amount of thermal power generation capacity will still be required, less coal and gas will need to be burned. Nevertheless, until windmill power can mine ores, produce cement, and make steel and alloys and the machine tools to make components, then wind turbine costs are going to be highly connected to fossil fuel prices, and those costs will impact power prices.

In the U.S., substantial further development of wind power will require significant investment in upgrading the national electricity grid.

8. SOLAR PHOTOVOLTAICS (PV)

Photovoltaic (PV) cells generate electricity directly from sunlight. PV cells usually use silicon as a semiconductor material. Since an enormous amount of

energy is transmitted to the Earth's surface in the form of solar radiation, tapping this source has great potential. If only 0.025 percent of this energy flow could be captured, it would be enough to satisfy world electricity demand.

In 2006 and 2007, photovoltaic systems were the fastest growing energy technology in the world (on a percentage basis), increasing 50 percent annually. At the beginning of 2008, world PV installed capacity stood at 12.4 GW.

The goals of PV research are primarily to *(1)* increase the efficiency of the process of converting sunlight into electricity (the typical efficiency of an installed commercial single-crystalline silicon solar panel is 10 percent, meaning that only 10 percent of the energy of sunlight is converted to electrical energy; while 24.7 percent efficiency has been achieved under laboratory conditions); and *(2)* decrease the cost of production (single-crystalline silicon panels average $3.00 per watt installed, while new photovoltaic materials and technologies, especially thin-film PV materials made by printing or spraying nanochemicals onto an inexpensive plastic substrate, promise to reduce production costs dramatically, though usually at a loss of efficiency or durability).[50]

PLUS: The solar energy captured by photovoltaic technology is renewable—and there is a lot of it. The cumulative average energy irradiating a square meter of Earth's surface for a year is approximately equal to the energy in a barrel of oil; if this sunlight could be captured at 10 percent efficiency, 3,861 square miles of PV arrays would supply the energy of a billion barrels of oil. Covering the world's estimated 360,000 square miles of building rooftops with PV arrays would generate the energy of 98 billion barrels of oil each year.

The price for new installed PV generating capacity has been declining steadily for many years.

Unlike passive solar systems, PV cells can function on cloudy days.[51]

MINUS: The functionality of PV power generation varies not only daily, but also seasonally with cloud cover, sun angle, and number of daylight hours. Thus, as with wind, the uncontrolled, intermittent nature of PV reduces its value as compared to operator-controlled energy sources such as coal, gas, or nuclear power.

Sunlight is abundant, but diffuse; its area density is low. Thus efforts to harvest energy from sunlight are inevitably subject to costs and tradeoffs with scale: for example, large solar installations require suitable land, water for periodic cleaning, roads for access by maintenance vehicles, and so on.

Some of the environmental impacts of manufacturing PV systems have been analyzed by Alsema *et al.* and compared to the impacts of other energy technologies.[52] This study found PV system CO_2 emissions to be greater than those for wind systems, but only 5 percent of those from coal burning. A potential impact would be the loss of large areas of wildlife habitat if really large industrial-scale solar arrays were built in undeveloped desert areas.

EROEI: Explicit net energy analysis of PV energy is scarce. However, using "energy pay-back time" and the lifetime of the system, it is possible to determine a rough EROEI. From a typical life-cycle analysis performed in 2005, Hall *et al.* calculated an EROEI of 3.75:1 to 10:1.[53]

Some of these EROEI values are likely to change as research and development continue. If present conditions persist, EROEI may decline since sources of silicon for the industry are limited by the production capacity of semiconductor manufacturers.

PROSPECTS: Despite the enormous growth of PV energy in recent years, the incremental increase in oil, gas, or coal production during a typical recent year has exceeded all existing photovoltaic energy production. Therefore if PV is to become a primary energy source, the rate of increase in capacity will need to be even greater than is currently the case.

Because of its high up-front cost, a substantial proportion of installed PV has been distributed on home roofs and in remote off-grid villages, where provision of conventional electricity sources would be impractical or prohibitively expensive. Commercial utility-scale PV installations are now appearing in several nations, partly due to the lower price of newer thin-film PV materials and changing government policies.[54]

The current economic crisis has lowered the rate of PV expansion substantially, but that situation could be reversed if government efforts to revive the economy focus on investment in renewable energy.

However, if very large and rapid growth in the PV industry were to occur, the problem of materials shortages would have to be addressed in order to avert dramatic increases in cost. Materials in question—copper, cadmium-telluride (CdTe), and copper-indium-gallium-diselenide (CIGS)—are crucial to some of the thin-film PV materials to which the future growth of the industry (based on lowering of production costs) is often linked. With time, PV production may be constrained by lack of available materials, the rate at which materials can be recovered or recycled, or possibly by competition with other industries for those scarce materials. A long-term solution will hinge on the development of new PV materials that are common and cheap.

Concentrating PV, which uses lenses to focus sunlight onto small, highly efficient silicon wafers, is achieving ever-lower costs and ever-higher efficiencies, and could be competitive with coal, nuclear, and natural gas power generation on an installed per-watt capacity basis within just a few years. Nevertheless, this technology is still in its infancy and even if it can be developed further the problem of intermittency will remain.

9. ACTIVE (CONCENTRATING) SOLAR THERMAL

This technology typically consists of installations of mirrors to focus sunlight, creating very high temperatures that heat a liquid which turns a turbine, producing electricity. The same power plant technology that is used with fossil fuels can be used with solar thermal since the focusing collectors can heat liquid to temperatures from 300°C to 1000°C. Fossil fuel can be used as a backup at night or when sunshine is intermittent.

There is a great deal of interest and research in active solar thermal and a second generation of plants is now being designed and built, mostly in Spain. Worldwide capacity will soon reach 3 GW.

PLUS: Like PV, active solar thermal makes use of a renewable source of energy (sunlight), and there is enormous potential for growth. In the best locations, cost per watt of installed capacity is competitive with fossil-fuel power sources. Solar thermal benefits from using already mature power plant



technology and needs less land than a photovoltaic array of the same generating capacity.

MINUS: Again like PV, concentrating solar thermal power is intermittent and seasonal. Some environmental impacts are to be expected on the land area covered by mirror arrays and during the construction of transmission lines to mostly desert areas where this technology works best.

EROEI: The energy balance of this technology is highly variable depending on location, thus few studies have been done. In the best locations (areas with many sunny days per year), EROEI is likely to be relatively high.

PROSPECTS: There is considerable potential for utility-scale deployment of concentrating solar thermal power. Some analysts have even suggested that all of the world's energy needs could be filled with electrical power generated by this technology. This would require covering large areas of desert in the southwestern U.S., northern Africa, central Asia, and central Australia with mirrors, as well as constructing high-power transmission lines from these remote sites to places where electricity demand is highest. Such a project is possible in principle, but the logistical hurdles and financial costs would be daunting. Moreover, some intermittency problems would remain even if the sunniest sites were chosen.

Leaving aside such grandiose plans, for nations that lie sufficiently close to the equator this appears to be one of the most promising alternative sources of energy available.[21]

Recently a startup project called Desertec has proposed raising an estimated $570 billion for the

construction of an enormous active solar thermal installation in the Sahara Desert to supply 15 percent of Europe's electricity needs. Concentrating solar thermal plants in Spain are now testing a heat storage module,[25] which can maintain power delivery during nights and perhaps longer periods of low sunshine. Since thermal energy is much cheaper to store than electricity, this could represent an advantage over wind or PV power if the Spanish tests are successful.

10. PASSIVE SOLAR



This simple approach consists of capturing and optimizing natural heat and light from the sun within living spaces without the use of collectors, pumps, or mechanical parts, thus reducing or eliminating the need for powered heating or lighting. Buildings are responsible for a large percentage of total energy usage in most countries, and so passive solar technologies are capable of offsetting a substantial portion of energy production and consumption that might otherwise come from fossil fuels. A passive solar building is designed *(1)* to maintain a comfortable average temperature, and *(2)* to minimize temperature fluctuations. Such a building usually takes more time, money, and design effort to construct, with extra costs made up in energy savings over time.

Passive solar heating takes three dominant forms: glazing surfaces to help capture sunlight; *trombe walls*, and other features for heat storage; and insulation to maintain relatively constant temperatures. Other important factors include orienting the long side of the building toward the sun, determining the appropriate sizing of the mass required to retain and slowly release accumulated heat after the sun sets, and determining the size of the trombe wall necessary to heat a given space. (Of course, the size of the entire building is also an issue—a passive solar design for a monster home makes no sense.)

Other passive uses of sunlight in buildings include passive solar cooling and daylighting (using windows and openings to make use of natural light).

PLUS: Depending on the study, passive solar homes cost less than, the same as, or up to 5 percent more than other custom homes; however, even in the latter case the extra cost will eventually pay for itself in energy savings. A passive solar home can only provide heat for its occupants, not extra electricity, but if used on all new houses passive systems could go a long way toward replacing other fuels.

Incorporating a passive solar system into the design of a new home is generally cheaper than fitting it onto an existing home. A solar home "decreases cooling loads and reduces electricity consumption, which leads to significant decline in the use of fossil fuels."[26] Passive solar buildings, in contrast to buildings with artificial lighting, may also provide a healthier, more productive work environment.

MINUS: Limitations to passive solar heating can include inappropriate geographic location (clouds and colder climates make solar heating less effective), and the relative difficulties of sealing the house envelope to reduce air leaks while not increasing the chance of pollutants becoming trapped inside. The heat-collecting, equator-facing side of the house needs good solar exposure in the winter, which may require spacing houses further apart and using more land than would otherwise be the case.

EROEI: Strictly speaking, it is not appropriate to use EROEI calculations in this instance since there is no "energy out" for the equation. Passive solar design is essentially a matter of using the "free energy" of nature to replace other forms of energy that would otherwise need to be used for heating and lighting. It is extremely site-specific, and architects rarely obtain quantitative feedback on systems they have designed, so determining general figures

for savings is difficult (but a range from 30 to 70 percent is typical). If the system is built into the house from the beginning, then energy savings can be obtained with few or no further investments.

PROSPECTS: Designing buildings from the start to take advantage of natural heating and lighting, and to use more insulation and solar mass, has tremendous potential to reduce energy demand. However, in many cases high-efficiency buildings require more energy for construction, (construction energy is not generally considered in savings calculations, which are typically done only on operational energy).

Until now, higher up-front construction costs have discouraged mass-scale deployment of passive solar homes in most countries. Higher energy prices will no doubt gradually alter this situation, but quicker results could be obtained through shifts in building regulations and standards, as has been shown in Germany. There, the development of the voluntary Passivhaus standard has stimulated construction and retrofitting of more than 20,000 passive houses in northern Europe.[57] The Passivhaus is designed to use very little energy for heating. Passive solar provides space heating, and superinsulation and controlled outdoor air exchange (usually with heat exchanger) reduces heat loss.

Buildings in industrialized nations have generally become more efficient in recent years; however declines in averaged energy use per square foot have generally been more than offset by population growth and the overbuilding of real estate (the average size of buildings has grown), so that the total amount of energy used in buildings has continued to increase. Thus, population and economic growth patterns need to be part of the "green building" agenda, along with the increasing use of passive solar design elements.[58]

11. GEOTHERMAL ENERGY

Derived from the heat within the Earth, geothermal energy can be "mined" by extracting hot water or steam, either to run a turbine for electricity generation or for direct use of the heat. High-quality geothermal energy is typically available only in regions where tectonic plates meet and volcanic



GEOTHERMAL RIBBECKITE GEYSER, LITTLE GEYSER

and seismic activity are common. Low-temperature geothermal direct heat can be tapped anywhere on Earth by digging a few meters down and installing a tube system connected to a heat pump.

Currently, the only places being exploited for geothermal electrical power are where hydrothermal resources exist in the form of hot water or steam reservoirs. In these locations, hot groundwater is pumped to the surface from two to three km deep wells and used to drive turbines. One example: The Geysers installation in Northern California, occupying 30 square miles along the Sonoma and Lake County border, comprises the world's largest complex of geothermal power plants. The fifteen power plants there have a total net generating capacity of about 725 MW of electricity—enough to power 725,000 homes, or a city the size of San Francisco. The Geysers meets the typical power needs of Sonoma, Lake, and Mendocino counties, as well as a portion of the power needs of Marin and Napa counties.

Power can also be generated from hot dry rocks by pumping turbine fluid (essentially water) into them through three to ten km deep boreholes. This method, called Enhanced Geothermal System (EGS) generation, is the subject of a great deal of research, but no power has been generated commercially using EGS. If perfected, EGS could enable geothermal power to be harvested in far more places than is currently practical.

In 2006, world geothermal power capacity was about 10 GW.[59] Annual growth of geothermal power capacity worldwide has slowed from 9 percent in 1997 to 2.5 percent in 2004.

However, the use of direct heat using heat pumps or piped hot water has been growing 30 to 40 percent annually, particularly in Europe, Asia, and Canada.[59] (This is a fundamentally different technology from geothermal electricity production, even though the basic resource—heat from the Earth—is the same.)

PLUS: Geothermal power plants produce much lower levels of carbon emissions and use less land area as compared to fossil fuel plants. They can also run constantly, unlike some other renewable energy systems, such as wind and solar.

Geothermal direct heat is available everywhere (and geothermal heat pumps are among the few non-fossil fuel options for space heating), although it is less cost-effective in temperate climates. Countries rich in geothermal resources (such as Sudan, Ethiopia, Colombia, Ecuador, much of the Caribbean, and many Pacific islands) could become less dependent on foreign energy.

MINUS: In addition to geography and technology, high capital cost and low fossil fuel prices are major limiting factors for the development of geothermal electricity production. Technological improvements (especially the further development of EGS) are necessary for the industry to continue to grow. Water can also be a limiting factor, since both hydrothermal and dry rock systems consume water.

The sustainability of geothermal power generating systems is a cause of concern. Geothermal resources are only renewable if heat removal is balanced by natural replenishment of the heat source. Some geothermal plants have seen declines in temperature, most probably because the plant was oversized for the local heat source.

There is likely to be some air, water, thermal, and noise pollution from the building and operation of a geothermal plant, as well as solid waste buildup and the possibility of induced seismic activity near it.

EROEI: The calculated net energy for hydrothermal power generation has ranged, depending on the researcher, from 2:1 to 13:1. This discrepancy reflects differences in efficiency due to site characteristics and the lack of a unified methodology for EROEI analysis, as well as disagreements about system boundaries, quality-correction, and future expectations.[60]

There are no calculations of EROEI values for geothermal direct heat use, though for various reasons it can be assumed that they are higher than those for hydrothermal electrical power generation. As a starting point, it has been calculated that heat pumps move three to five times the energy in heat that they consume in electricity.

PROSPECTS: There is no consensus on potential resource base estimates for geothermal power generation. Hydrothermal areas that have both heat and water are rare, so the large-scale expansion of geothermal power depends on whether EGS and other developing technologies will prove to be commercially viable. A 2006 MIT report estimated U.S. hydrothermal resources at 2,400 to 9,600 EJ, while dry-heat geothermal resources were estimated to be as much as 13 million EJ.[61]

Until EGS is developed and deployed, limited hydrothermal resources will continue to be important regionally.

Meanwhile, direct geothermal heat use via heat pumps provides one of the few available alternatives to the use of fossil fuels or wood for space heating, and is therefore likely to see an increased rate of deployment in colder climates.

12. ENERGY FROM WASTE



Trash can be burned to yield energy, and methane can be captured from landfills. All told, the world derives over 100 TWh of electricity, and an even greater amount of useful heat energy, from waste,

amounting to about 1 percent of all energy used globally.

In the U.S., 87 trash incinerating generation plants produce about 12.3 TWh of electricity per year. Municipal waste is also burned for power in Europe; Taiwan, Singapore, and Japan incinerate 50 to 80 percent of their waste. There are 600 incineration plants producing energy worldwide. However, the practice is mostly restricted to high-income countries because such plants are expensive to operate and the waste stream in low-income nations typically has low calorific value. One estimate for total energy produced is 430 TWh, but this includes heat energy as well as electricity.[53]

The capture of landfill gas yields 11 TWh of electricity and 77 billion cubic feet of gas for direct use annually in the U.S. (from 340 out of a total of 2,975 landfills).[54] In Europe, landfill gas provides 17 TWh of electricity as well as heat energy, for a total of 36.3 TWh of biogas energy; there, recovery of biogas is now mandatory.

PLUS: Industrial waste products contain embodied energy; thus efforts to recover that energy can be thought of as a way of bringing greater efficiency to the overall industrial system. Energy production from waste does not entail the extraction of more natural resources than have already been used in the upstream activities that generated the waste (other than the resources used to build and operate the waste-to-energy plants themselves).

MINUS: Waste incineration releases into the environment whatever toxic elements are embodied in the waste products that are being burned—including dioxin, one of the most deadly compounds known. Moreover, incinerators emit more CO_2 per unit of energy produced than coal-fired, natural-gas-fired, or oil-fired power plants.

If energy efficiency is the goal, a better systemic solution to dealing with wastes would be to minimize the waste stream. Moreover, a zero-waste approach is one of the fastest, cheapest, and most effective strategies to protect the climate and the environment: significantly decreasing waste disposed in landfills and incinerators could reduce greenhouse gases by an amount equivalent to the closing of one-fifth of U.S. coal-fired power plants. However, if economic activity continues to decline, as a result of slower economic growth, less waste will be produced, one of the up-sides of financial decline.

EROEI: Little information is available on the net energy from waste incineration or landfill gas capture. If system boundaries are narrowly drawn (so that only direct energy costs are included), the EROEI from landfill gas capture is likely to be high. EROEI from trash incineration is likely to decline as more investment is directed toward preventing toxic materials from being released from burners.

PROSPECTS: If and when zero-waste policies are more generally adopted, the amount of waste available to be burned or placed into landfills will decline dramatically. Therefore waste-to-energy projects should not be regarded as sustainable over the long term, nor should this energy source be regarded as being scalable—that is, it is unlikely to be dramatically increased in overall volume.

13. ETHANOL

Ethanol is an alcohol made from plant material—usually sugar cane or corn—that is first broken down into sugars and then fermented. It has had a long history of use as a transportation fuel beginning with the Model T Ford. In 2007, 13.1 billion gallons of ethanol were produced globally. Thirty-eight percent of this was produced from sugar cane in Brazil, while another 50 percent was manufactured from corn in the U.S.[55] There has been a high rate of growth in the industry, with a 15 percent annual increase in world production between 2000 and 2006. Ethanol can be substituted for gasoline, but the total quantity produced is still only a small fraction of the 142 trillion gallons of gasoline consumed in the U.S. each year.[56]

Ethanol can be blended with gasoline and used in existing cars in concentrations of up to 10 percent. For percentages higher than this, engine modifications are needed since ethanol is more corrosive than gasoline. New cars are already being manufactured that run on 100 percent ethanol, on the 25/75 ethanol/gasoline "gasohol" blend used in Brazil, or the 85/15 ("E85") blend found in the United States.

Corn ethanol has become highly controversial because of problems associated with using a staple food plant such as corn as a fuel, and the resulting



ETHANOL PLANT, SOUTH DAKOTA

diversion of huge amounts of land from food production to fuel production. Another problem is that ethanol plants are themselves usually powered by fossil fuels.[67] However, there is now growing interest in making ethanol from non-food plant materials like corn stover, wheat chaff, or pine trees. One potential feedstock is the native prairie plant switchgrass, which requires less fossil fuel input for cultivation than corn. However, making cellulosic ethanol out of these non-food feedstocks is a technology in its infancy and not yet commercialized.

Potential ethanol resources are limited by the amount of land available to grow feedstock. According to the Union of Concerned Scientists (UCS), using all of the corn grown in the U.S. with nothing left for food or animal feed would only displace about 15 percent of U.S. gasoline demand by 2025.[68] Large-scale growing of switchgrass or other new cellulose crops would require finding very large acreages on which to cultivate them, also aggravating shortages of agricultural lands.

PLUS: Ethanol has the portability and flexibility of oil and can be used in small amounts blended with gasoline in existing vehicles. The distribution infrastructure for gasoline could be gradually switched over to ethanol as new cars that run on higher ethanol concentrations are phased in, though current pipelines would eventually have to be replaced as ethanol is highly corrosive.

Cellulosic ethanol is widely considered to be a promising energy source since it has potentially less environmental impact with respect to land use and lifecycle greenhouse gas emissions than fossil fuels. The UCS reports that it has the potential to reduce greenhouse gas emissions by 80 to 90 percent compared to gasoline.[69] However, this conclusion is disputed, and there are still serious technical problems with producing cellulosic ethanol on a commercial scale.

MINUS: There are approximately 45 MJ per kilogram contained in both finished gasoline and crude oil, while ethanol has an energy density of about 26 MJ per kilogram and corn has only 16 MJ per kilogram. In general, this means that large amounts of corn must be grown and harvested to equal even a small portion of existing gasoline consumption on an energy-equivalent level, which will undoubtedly expand the land area that is impacted by the production process of corn-based ethanol.

Increases in corn ethanol production may have helped to drive up the price of corn around the world in 2007, contributing to a 400 percent rise in the price of tortillas in Mexico.[70] Ethanol and other biofuels now consume 17 percent of the world's grain harvest.

There are climate implications to corn ethanol production as well. If food crops are used for making transportation fuel rather than food, more land will have to go into food production somewhere else. When natural ecosystems are cleared for food or ethanol production, the result is a "carbon debt" that releases 17 to 420 times more CO_2 than is saved by the displacement of fossil fuels.[71] The situation is better when dealing with existing cropland, but not much: Since fossil fuels are necessary for growing corn and converting it into ethanol, the finished fuel is estimated to offer only a 10 to 25 percent reduction in greenhouse gas emissions as compared to gasoline,[72] though even this level of reduction is questionable, as it relies on calculations involving DDGS; considering only liquid fuels, there is likely less or no greenhouse gas reduction. Corn ethanol also uses three to six gallons of water for every gallon of ethanol produced and has been shown to emit more air pollutants than gasoline.

EROEI: There is a range of estimates for the net energy of ethanol production since EROEI depends on widely ranging variables such as the energy input required to get the feedstock (which is high for corn and lower for switchgrass and cellulose waste materials) and the nature of the process used to convert it to alcohol.

There is even a geographic difference in energy input depending on how well suited the feedstock crop is to the region in which it is grown. For example, there is a definite hierarchy of corn productivity by state within the U.S.: in 2005, 173 bushels per acre (10,859 kg/ha) were harvested in Iowa, while only 113 bushels per acre were harvested in Texas (7,093 kg/ha). This is consistent with the general principle of "gradient analysis" in ecology, which holds that individual plant species grow best near the middle of their gradient space; that is near the center of their range in environmental conditions such as temperature and soil moisture. The climatic conditions in Iowa are clearly at the center of corn's gradient space. Statistics suggest that corn production is also less energy-intensive at or near the center of corn's gradient space.[8] This would imply a diminishing EROEI for ethanol production as the distance from Iowa increases, meaning that the geographic expansion of corn production will produce lower yields at higher costs. Indeed, ethanol production in Iowa and Texas yield very different energy balances, so that in Iowa the production of a bushel of corn costs 43 MJ, while in Texas it costs 71 MJ.

Calculated net energy figures for corn ethanol production in the U.S. range from less than 1:1 to 1.8:1.[9]

Ethanol from sugar cane in Brazil is calculated to have an EROEI of 8:1 to 10:1, but when made from Louisiana sugar cane in the U.S., where growing conditions are worse, the EROEI is closer to 1:1.[10] Estimates for the projected net energy of cellulose ethanol vary widely, from 2:1 to 36:1.[11] However, such projections must be viewed skeptically, given the absence of working production facilities.

These EROEI figures differ largely because of co-product crediting (i.e., adding an energy return figure to represent the energy replacement value of usable by-products of ethanol production—principally DDGS). In the USDA's figures for energy use in ethanol production, EROEI is 1.04 prior to the credits. But some analysts argue that co-product crediting is immaterial to the amount of energy required to produce ethanol. Distillation is highly energy intensive, and even more so in the case of cellulosic ethanol because the initial beer concentration is so low (about 4 percent compared to 10 to 12 percent for corn). This dramatically increases the amount of energy needed to boil off the remaining water. At absolute minimum, 15,000 BTU of energy are required in distillation alone per gallon of ethanol produced (current corn ethanol plants use about 40,000 BTU per gallon). This sets the limit on EROEI. If distillation were the only energy input in the process, and it could be accomplished at the thermodynamic minimum, then EROEI would be about 5:1. But there are other energy inputs to the process and distillation is not at the thermodynamic minimum.

Sugar cane EROEI estimates and cellulosic estimates that are frequently cited exclude non-fossil fuel energy inputs. For example, 8 to 10:1 EROEI numbers for the production of ethanol from sugar cane in Brazil exclude all bagasse (dry, fibrous residue remaining after the extraction of juice from the crushed stalks of sugar cane) burned in the refinery—which is clearly an energy input, though one that is derived from the sugar cane itself. Cellulosic ethanol EROEI estimates often assume that the lignin recovered from biomass is sufficient not only to fuel the entire plant, but to export 1 to 2 MJ of electricity per liter of ethanol produced (which is then credited back to the ethanol). However, this assumption is based on a single lab study that has not been replicated. The questions of whether these non-fossil energy inputs should be included or excluded in net energy calculations, and how such inputs should be measured and evaluated, are contested.

PROSPECTS: Ethanol's future as a major transport fuel is probably dim except perhaps in Brazil, where sugar cane supplies the world's only economically competitive ethanol industry. The political power of the corn lobby in the United States has kept corn ethanol subsidized and has kept investment flowing, but the fuel's poor net energy performance will eventually prove it to be uneconomic. The technical problems of processing cellulose for ethanol may eventually be overcome, but land use considerations and low EROEI will likely limit the scale of production.

14. BIODIESEL



JOSEPH E. SMEDRA

This is a non-petroleum-based diesel fuel made by *transesterification* of vegetable oil or animal fat (tallow)—a chemical treatment to remove glycerine, leaving long-chain alkyl (methyl, propyl, or ethyl) esters. Biodiesel can be used in unmodified diesel engines either alone, or blended with conventional petroleum diesel. Biodiesel is distinguished from straight vegetable oil (SVO), sometimes referred to as "waste vegetable oil" (WVO), "used vegetable oil" (UVO), or "pure plant oil" (PPO). Vegetable oil can itself be used as a fuel either alone in diesel engines with converted fuel systems, or blended with biodiesel or other fuels.

Vegetable oils used as motor fuel or in the manufacture of biodiesel are typically made from soy, rape seed ("canola"), palm, or sunflower. Considerable research has been devoted to producing oil for this purpose from algae, with varying reports of success (more on that below).

Global biodiesel production reached about 8.2 million tons (230 million gallons) in 2006, with approximately 85 percent of production coming from the European Union, but with rapid expansion occurring in Malaysia and Indonesia.[75]

In the United States, average retail (at the pump) prices, including Federal and state fuel taxes, of B2/B5 are lower than petroleum diesel by about 12 cents, and B20 blends are the same as petrodiesel. B99 and B100 generally cost more than petrodiesel except where local governments provide a subsidy. (The number following "B" in "B20," "B99," etc., refers to the percentage of biodiesel in the formulation of the fuel; in most instances, the remaining percentage consists of petroleum diesel. Thus "B20" fuel consists of 20 percent biodiesel and 80 percent petroleum diesel.)

PLUS: Biodiesel's environmental characteristics are generally more favorable than those of petroleum diesel. Through its lifecycle, biodiesel emits one fifth the CO_2 of petroleum diesel, and contains less sulfur. Some reports suggest that its use leads to longer engine life, which presumably would reduce the need for manufacturing replacement engines.[76] When biodiesel is made from waste materials like used vegetable oil, the net environmental benefits are more pronounced.

MINUS: The principal negative impact of expanding biodiesel production is the need for large amounts of land to grow oil crops. Palm oil is the most fruitful oil crop, producing 13 times the amount of oil as soybeans, the most-used biodiesel feedstock in the United States. In Malaysia and Indonesia, rainforest is being cut to plant palm oil plantations, and it has been estimated that it will take 100 years for the climate benefits of biodiesel production from each acre of land to make up for the CO_2 emissions from losing the rainforest.[77] Palm oil production for food as well as fuel is driving deforestation across Southeast Asia and reducing rainforest habitat to the point where larger animal species, such as the orangutan, are threatened with extinction.[78] Soybean farming in Brazil is already putting pressure on Amazonian rainforests. If soybeans begin to be used extensively for biofuels this pressure will increase.

EROEI: The first comprehensive comparative analysis of the full life cycles of soybean biodiesel and corn grain ethanol has concluded that biodiesel has much less of an impact on the environment and a much higher net energy benefit than corn ethanol, but that neither can do much to meet U.S. energy demand.[79] Researchers tracked all the energy used for growing corn and soybeans and converting the crops into biofuels. They also examined how much fertilizer and pesticide corn and soybeans required and the quantities of greenhouse gases, nitrogen oxides, phosphorus, and pesticide pollutants each released into the environment. The study showed a positive energy balance for both fuels; however,

the energy returns differed greatly: soybean biodiesel currently returns 93 percent more energy than is used to produce it (1.93:1), while corn grain ethanol provides, according to this study, only 25 percent more energy (1.25:1). When discussing such distinctions, it is important to recall that industrial societies emerged in the context of energy returns in the double digits—50:1 or more, meaning fifty times as much energy yielded as invested.

Other researchers have claimed that the net energy of soybean biodiesel has improved over the last decade because of increased efficiencies in farming, with one study calculating an EROEI of 3.5:1.[52] Palm oil biodiesel has the highest net energy, calculated by one study at 9:1.[53]

PROSPECTS: There are concerns, as with ethanol, that biodiesel crops will increasingly compete with food crops for land in developing countries and raise the price of food. The need for land is the main limitation on expansion of biodiesel production and is likely to restrict the potential scale of the industry.[54] Water is also a limiting factor, given that world water supplies for agricultural irrigation are already problematic.

Biodiesel can also be made from algae, which in turn can be grown on waste carbon sources, like the CO_2 scrubbed from coal-burning power plants or sewage sludge. Saltwater rather than freshwater can be used to grow the algae, and there is optimism that this technology can be used to produce significant amounts of fuel. However, the process is still in a developmental stage. Limiting factors may be the need for large closed bioreactors, water supply, sunshine consistency, and thermal protection in cold climates.[55]

Biodiesel from waste oil and fats will continue to be a small and local source of fuel, while algae-growing shows promise as a large-scale biodiesel technology only if infrastructure and maintenance costs can be minimized.

15. TAR SANDS

Sometimes called "oil sands," this controversial fossil fuel consists of bitumen (flammable mixtures of hydrocarbons and other substances that are components of asphalt and tar) embedded in sand or clay.



OIL SANDS OPEN PIT MINING NEAR FORT MCMURRAY, ALBERTA, CANADA

The resource is essentially petroleum that formed without a geological "cap" of impervious rock (such as shale, salt, or anhydrite) being present to prevent lighter hydrocarbon molecules from rising to the surface, and that therefore volatized rather than remaining trapped underground.

Tar sands can be extracted through an *in situ* underground liquefaction process by the injection of steam, or by mining with giant mechanized shovels. In either case, the material remains fairly useless in its raw state, and requires substantial processing or upgrading, the finished product being referred to as "syncrude."

The sites of greatest commercial concentration of the resource are in Alberta, Canada and the Orinoco Basin of Venezuela (where the resource is referred to as heavy oil). Current production of syncrude from operations in Canada amounts to about 1.5 million barrels per day, which accounts for 1.7 percent of total world liquid fuels production, or a little less than 0.7 percent of total world energy. Reserves estimates range widely, from less than 200 billion barrels of oil equivalent up to 1.7 trillion barrels in Canada; for Venezuela the most-cited reserves estimate of extra heavy crude is 235 billion barrels, though in both cases it is likely that a large portion of what has been classified as "reserves" should be considered unrecoverable "resources" given the likelihood that deeper and lower-quality tar sands will require more energy for their extraction and processing than they will yield.

PLUS: The only advantages of tar sands over conventional petroleum are that *(1)* large amounts remain to be extracted, and *(2)* the place where the

resource exists in greatest quantity (Canada) is geographically close and politically friendly to the country that imports the most oil (the U.S.).

MINUS: Tar sands have all of the negative qualities associated with the other fossil fuels (they are nonrenewable, polluting, and climate-changing), but in even greater measure than is the case with natural gas or conventional petroleum. Tar sands production is the fastest-growing source of Canada's greenhouse gas emissions, with the production and use of a barrel of syncrude ultimately doubling the amount of CO_2 that would be emitted by the production and use of a barrel of conventional petroleum. Extraction of tar sands has already caused extensive environmental damage across a broad expanse of northern Alberta.

All of the techniques used to upgrade tar sands into syncrude require other resources. Some of the technologies require significant amounts of water and natural gas—as much as 4.5 barrels of water and 1200 cubic feet (34 cubic meters) of natural gas for each barrel of syncrude.

As a result, syncrude is costly to produce. A fixed per-barrel dollar cost is relatively meaningless given recent volatility in input costs; however, it is certainly true that production costs for syncrude are much higher than historic production costs for crude oil, and compare favorably only with the higher costs for the production of a new marginal barrel of crude using expensive new technologies.

EROEI: For tar sands and syncrude production, net energy is difficult to assess directly. Various past net energy analyses for tar sands range from 1.5:1 to 7:1, with the most robust and recent of analyses suggesting a range of 5.2:1 to 5.8:1.[79] This is a small fraction of the net energy historically derived from conventional petroleum.

PROSPECTS: The International Energy Agency expects syncrude production in Canada to expand to 5 mb/d by 2030, but there are good reasons for questioning this forecast. The environmental costs of expanding production to this extent may be unbearable. Further, investment in tar sands expansion is now declining, with more than US$60 billion worth of projects having been delayed in the last three months of 2008 as the world skidded into recession. A more realistic prospect for tar sands production may be a relatively constant production rate, rising perhaps only to 2 or 3 million barrels per day.

16. OIL SHALE

If tar sands are oil that was "spoiled" (in that the shorter-chained hydrocarbon molecules have volatized, leaving only hard-to-use bitumen), oil shale (or kerogen, as it is more properly termed) is oil that was undercooked: it consists of source material that was not buried at sufficient depth or for long enough to be chemically transformed into the shorter hydrocarbon chains found in crude oil or natural gas.

Deposits of potentially commercially extractable oil shale exist in thirty-three countries, with the largest being found in the western region of the U.S. (Colorado, Utah, and Wyoming). Oil shale is used to make liquid fuel in Estonia, Brazil, and China; it is used for power generation in Estonia, China, Israel, and Germany; for cement production in Estonia, Germany, and China; and for chemicals production in China, Estonia, and Russia. As of 2005, Estonia accounted for about 70 percent of the world's oil shale extraction and use. The percentage of world energy currently derived from oil shale is negligible, but world resources are estimated as being equivalent to 2.8 trillion barrels of liquid fuel.[80]

PLUS: As with tar sands, the only real upside to oil shale is that there is a large quantity of the resource in place. In the U.S. alone, shale oil resources are estimated at 2 trillion barrels of oil equivalent, nearly twice the amount of the world's remaining conventional petroleum reserves.

MINUS: Oil shale suffers from low energy density, about one-sixth that of coal. The environmental impacts from its extraction and burning are very high, and include severe air and water pollution and the release of half again as much CO_2 as the burning of conventional oil. The use of oil shale for heat is far more polluting than natural gas or even coal. Extraction on a large scale in the western U.S. would require the use of enormous amounts of water in an arid region.

EROEI: Reported EROEI for oil produced from oil shale is generally in the range of 1.5:1 to 4:1[81]. Net energy for this process is likely to be

lower than the production of oil from tar sands because of the nature of the material itself.

PROSPECTS: During the past decades most commercial efforts to produce liquid fuels from oil shale have ended in failure. Production of oil shale worldwide has actually declined significantly since 1980. While low-level production is likely to continue in several countries that have no other domestic fossil fuel resources, the large-scale development of production from oil shale deposits seems unlikely anywhere for both environmental and economic reasons.

17. TIDAL POWER



TIDAL POWER PLANT DAM ON THE RANCE, FRANCE

Generation of electricity from tidal action is geographically limited to places where there is a large movement of water as the tide flows in and out, such as estuaries, bays, headlands, or channels connecting two bodies of water.

The oldest tidal power technology dates back to the Middle Ages, when it was used to grind grain. Current designs consist of building a barrage or dam that blocks off all or most of a tidal passage; the difference in the height of water on the two sides of the barrage is used to run turbines. A newer technology, still in the development stage, places underwater turbines called tidal stream generators directly in the tidal current or stream.

Globally, there is about 0.3 GW of installed capacity of tidal power[85], most of it produced by the barrage built in 1966 in France across the estuary of the Rance River (barrages are essentially dams across the full width of a tidal estuary).

PLUS: Once a tidal generating system is in place, it has low operating costs and produces reliable, although not constant, carbon-free power.

MINUS: Sites for large barrages are limited to a few places around the world. Tidal generators require large amounts of capital to build, and can have a significant negative impact on the ecosystem of the dammed river or bay.

EROEI: No calculations have been done for tidal power EROEI as yet. For tidal stream generators this figure might be expected to be close to that of wind power (an average EROEI of 18:1) since the turbine technologies for wind and water are so similar that tidal stream generators have been described as "underwater windmills." However, tidal EROEI figures would likely be lower due to the corrosiveness of seawater and thus higher construction and maintenance energy use. The EROEI of barrage systems might be somewhat comparable to that of hydroelectric dams (EROEI in the range of 11.2:1 to 267:1), but will likely be lower since the former only generate power for part of the tidal cycle.

PROSPECTS: One estimate of the size of the global annual potential for tidal power is 450 TWh, much of it located on the coasts of Asia, North America, and the United Kingdom.[86] Many new barrage systems have been proposed and new sites identified, but the initial cost is a difficulty. There is often strong local opposition, as with the barrage proposed for the mouth of the River Severn in the U.K. Tidal stream generators need less capital investment and, if designed and sited well, may have very little environmental impact. Prototype turbines and commercial tidal stream generating systems are being tested around the world.

18. WAVE ENERGY

Designed to work offshore in deeper water, wave energy harvests the up-and-down, wind-driven motion of the waves. Onshore systems use the force of breaking waves or the rise and fall of water to run pumps or turbines.

The commonly quoted estimate for potential global wave power generation is about 2 TW[87], distributed mostly on the western coasts of the Americas, Europe, southern Africa, and Australia,



PELAMIS WAVE ENERGY CONVERTER
EUROPEAN MARINE ENERGY TEST CENTRE

where wind-driven waves reach the shore after accumulating energy over long distances. For current designs of wave generators the economically exploitable resource is likely to be from 140 to 750 TWh per year.[32] The only operating commercial system has been the 2.25 MW Aguadora Wave Park off the coast of Portugal. (However, this was recently pulled ashore, and it is not clear when it will be redeployed).

Research into wave energy has been funded by both governments and small engineering companies, and there are many prototype designs. Once the development stage is over and the price and siting problems of wave energy systems are better understood, there may be more investment in them. In order for costs to decrease, problems of corrosion and storm damage must be solved.

PLUS: Once installed, wave energy devices emit negligible greenhouse gases and should be cheap to run. Since the majority of the world's population lives near coastlines, wave energy is convenient for providing electricity to many. It may also turn out to provide an expensive but sustainable way to desalinate water.

MINUS: In addition to high construction costs, there are concerns about the environmental impact of some designs, as they may interfere with fishing grounds. Interference with navigation and coastal erosion are also potential problems. Wave energy fluctuates seasonally as well as daily, since winds are stronger in the winter, making this a somewhat intermittent energy source.

EROEI: The net energy of wave energy devices has not been thoroughly analyzed. One rough estimate of EROEI for the Portuguese Pelamis device is 15:1.[33]

PROSPECTS: Wave power generation will need more research, development, and infrastructure build-out before it can be fairly assessed. More needs to be understood about the environmental impacts of wave energy "farms" (collections of many wave energy machines) so that destructive siting can be avoided. The best devices will need to be identified and improved, and production of wave devices will need to become much cheaper.

OTHER SOURCES

In addition to the eighteen energy sources discussed above, there are some other potential sources that have been discussed in the energy literature, but which have not reached the stage of application. These include: ocean thermal (which would produce energy from the temperature differential between surface and deep ocean water), "zero-point" and other "free energy" sources (which are asserted to harvest energy from the vacuum of space, but which have never been shown to work as claimed), Earth-orbiting solar collectors (which would beam electrical energy back to the planet in the form of microwave energy), Helium 3 from the Moon (Helium 3 does not exist in harvestable quantities on Earth, but if it could be mined on the Moon and brought back by shuttle, it could power nuclear reactors more safely than uranium does), and methane hydrates (methane frozen in an ice lattice—a material that exists in large quantities in tundra and seabeds, but has never successfully been harvested in commercially signifiant quantities). Of these, only methane hydrate has any prospect of yielding commercial amounts of energy in the foreseeable future; and even that will depend upon significant technological developments to enable the collecting of this fragile material. Methanol and butanol are not discussed here because their properties and prospects differ little from those of other biofuels.

Thus, over the course of the next decade or two, society's energy almost certainly must come from some combination of the eighteen sources above. In the next section we explore some of the opportunities for combining various of these alternative energy options to solve the evolving energy crisis.

TABLE 2: COMPARING CURRENT FUEL SOURCES

	Annual electricity produced (TWh)	Reserves	EROEI
Fossil Fuels	11,455	finite	Coal 50:1 Oil 19:1 Natural gas 10:1

	Annual electricity produced (TWh)	Potential electricity production (TWh)	EROEI
Hydropower	2894	8680	11:1 to 267:1
Nuclear	2626	5300	1.1:1 to 15:1
Wind	160	83,000	18:1
Biomass power	218	NA	NA
Solar PV	8	2000	3.75:1 to 10:1
Geothermal	63	1000 – 1,000,000	2:1 to 13:1
Solar thermal	1	up to 100,000	1.6:1
Tidal	.6	450	~ 6:1
Wave	~ 0	750	15:1

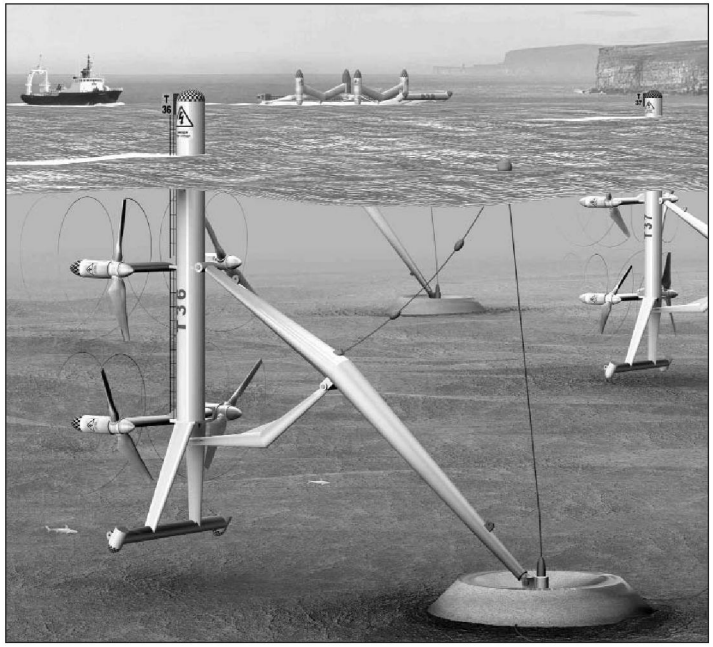
Table 2. Global annual electricity generation in terawatt-hours, estimated existing reserve or potential yearly production, and EROEI.[9] The largest current source of electricity (fossil fuels) has no long-term future, while the sources with the greatest potential are currently the least developed.

TABLE 3. COMPARING LIQUID FUEL SOURCES

	Global production (million barrels/year)	Reserves (trillion barrels)	EROEI
Oil	27,000	1.2	19:1
Tar sands	548	3.3	5.2:1 to 5.8:1
Oil shale	1.6	2.8	1.5:1 to 4:1

	Global production (million barrels/year)	Potential production (million barrels/year)	EROEI
Ethanol	260	1175	0.5:1 to 8:1
Biodiesel	5	255	1.9:1 to 9:1

Table 3. Liquid fuels: Current global annual production, reserves, potential production, and EROEI.[9]



Wave energy systems, such as depicted here, remain highly theoretical in practical terms. So far, the only operating commercial system is the Agucadora Wave Park off the coast of Portugal, recently pulled from service. Research continues, however, as wave energy releases no greenhouse gasses and for communities near shorelines it may yet prove practical, and with a high net energy potential. It could form a useful part of any mix of alternative renewable energy systems.

Five

TOWARD A FUTURE ENERGY MIX

A CURSORY EXAMINATION of our current energy mix yields the alarming realization that about 85 percent of our current energy is derived from three primary sources—oil, natural gas, and coal—that are non-renewable, whose price is likely to trend higher (and perhaps very steeply higher) in the years ahead, whose EROEI is declining, and whose environmental impacts are unacceptable. While these sources historically have had very high economic value, we cannot rely on them in the future. Indeed, the longer the transition to alternative energy sources is delayed, the more difficult that transition will be unless some practical mix of alternative energy systems can be identified that will have superior economic and environmental characteristics.

A process for designing an energy system to meet society's future needs must start by recognizing the practical limits and potentials of the available energy sources. Since *primary* energy sources (ones that are capable of replacing fossil fuels in terms of their percentage of the total energy supplied) will be the most crucial ones for meeting those needs, it is important to identify those first. Secondary sources (ones that are able to supply only a few percent of total energy) will also play their roles, along with "energy carriers" (forms of energy that make energy from primary sources more readily useful—as electricity makes the energy from coal useful in millions of homes).

A future primary energy source, at a minimum, must meet these make-or-break standards:

- It must be capable of providing a substantial amount of energy—perhaps a quarter of all the energy currently used nationally or globally;
- It must have a net energy yield of 10:1 or more;
- It cannot have unacceptable environmental (including climate), social, or geopolitical impacts (such as one nation gaining political domination over others); and
- It must be renewable.

A PROCESS OF ELIMINATION

Assuming that oil, natural gas, and coal will have rapidly diminishing roles in our future energy mix, this leaves fifteen alternative energy sources with varying economic profiles and varying environmental impacts. Since even the more robust of these are currently only relatively minor contributors to our current energy mix, this means our energy future will look very different from our energy present. The only way to find out what it might look like is to continue our process of elimination.

If we regard large contributions of climate-changing greenhouse gas emissions as a non-negotiable veto on future energy sources, that effectively removes tar sands and oil shale from the discussion. Efforts to capture and sequester carbon from these substances during processing would further reduce their already-low EROEI and raise their already-high production costs, so there is no path that is both economically realistic and environmentally

responsible whereby these energy sources could be scaled up to become primary ones. That leaves thirteen other candidates.

Biofuels (ethanol and biodiesel) must be excluded because of their low EROEI, and also by limits to land and water required for their production. (Remember: We are not suggesting that any energy source cannot play *some* future role; we are merely looking first for primary sources—ones that have the potential to take over all or even a significant portion of the current role of conventional fossil fuels.)

Energy-from-waste is not scalable; indeed, the "resource" base is likely to diminish as society becomes more energy efficient.

That leaves ten possibilities: nuclear, hydro, wind, solar PV, concentrating solar thermal, passive solar, biomass, geothermal, wave, and tidal.

Of these, nuclear and hydro are currently producing the largest amounts of energy. Hydropower is not without problems, but in the best instances its EROEI is very high. However, its capacity for growth in the U.S. is severely limited—there are not enough available undammed rivers—and worldwide it cannot do more than triple in capacity. Nuclear power will be slow and expensive to grow. Moreover, there are near-term limits to uranium ores, and technological ways to bypass those limits (e.g., with thorium reactors) will require time-consuming and expensive research. In short, both hydrower and nuclear power are unlikely candidates for rapid expansion to replace fossil fuels.

Biomass energy production is likewise limited in scalability, in this case by available land and water, and by the low efficiency of photosynthesis. America and the world could still obtain more energy from biomass, and production of *biochar* (a form of charcoal, usually made from agricultural waste, used as a soil amendment) raises the possibility of a synergistic process that would yield energy while building topsoil and capturing atmospheric carbon (though some analysts doubt this because pyrolysis, the process of making charcoal, emits not only CO_2 but other hazardous pollutants as well). Competition with other uses of biomass for food and for low-energy input agriculture will limit the amount of plant material available for energy production. Realistically, given the limits mentioned, biomass cannot be expected to sustainably produce energy on the scale of oil, gas, or coal.

Passive solar is excellent for space heating, but does not generate energy that could be used to run transportation systems and other essential elements of an industrial society.

That leaves six sources: Wind, solar PV, concentrating solar thermal, geothermal, wave, and tidal—which together currently produce only a tiny fraction of total world energy. And each of these still has its own challenges—like intermittency or limited growth potential.

Tidal, wave power, and geothermal electricity generation are unlikely to be scalable; although geothermal heat pumps can be used almost anywhere, they cannot produce primary power for transport or electricity grids.

Solar photovoltaic power is still expensive. While cheaper PV materials are now beginning to reach the market, these generally rely on rare substances whose depletion could limit deployment of the technology. Concentrating PV promises to solve some of these difficulties; however, more research is needed and the problem of intermittency remains.

With good geographical placement, wind and concentrating solar thermal have good net energy characteristics and are already capable of producing power at affordable prices. These may be the best candidates for non-fossil primary energy sources—yet again they suffer from intermittency.

Thus there is no single "silver-bullet" energy source capable of replacing conventional fossil fuels directly—at least until the problem of intermittency can be overcome—though several of the sources discussed already serve, or are capable of serving, as secondary energy sources.

This means that as fossil fuels deplete, and as society reduces reliance on them in order to avert catastrophic climate impacts, we will have to use every available alternative energy source strategically. Instead of a silver bullet, we have in our arsenal only BBs, each with a unique profile of strengths and weaknesses that must be taken into account.

But since these alternative energy sources are so diverse, and our ways of using energy are also diverse, we will have to find ways to connect source, deliv-

ery, storage, and consumption into a coherent system by way of common energy carriers.

COMMON CARRIERS: ELECTRICITY AND HYDROGEN

While society uses oil and gas in more or less natural states (in the case of oil, we refine it into gasoline or distil it into diesel before putting it into our fuel tanks), we are accustomed to transforming other forms of energy (such as coal, hydro, and nuclear) into electricity—which is energy in a form that is easy and convenient to use, transportable by wires, and that operates motors and a host of other devices with great efficiency.

With a wider diversity of sources entering the overall energy system, the choice of an energy carrier, and its further integration with transportation and space heating (which currently primarily rely on fossil fuels directly), become significant issues.

For the past decade or so energy experts have debated whether the best energy carrier for a post-fossil fuel energy regime would be electricity or hydrogen.[26] The argument for hydrogen runs as follows: Our current transportation system (comprised of cars, trucks, ships, and aircraft) uses liquid fuels almost exclusively. A transition to electrification would take time, retooling, and investment, and would face difficulties with electricity storage (discussed in more detail below): moreover, physical limits to the energy density by weight of electric batteries would mean that ships, large trucks, and aircraft could probably never be electrified in large numbers. The problem is so basic that it would remain even if batteries were substantially improved.

Hydrogen could more effectively be stored in some situations, and thus might seem to be a better choice as a transport energy carrier. Moreover, hydrogen could be generated and stored at home for heating and electricity generation, as well as for fueling the family car.

However, because hydrogen has a very low energy density per unit of volume, storage is a problem in this case as well: hydrogen-powered airplanes would need enormous tanks representing a substantial proportion of the size of the aircraft, and automobiles would need much larger tanks as well.



Moreover, several technological hurdles must be overcome before fuel cells—which would be the ideal means to convert the energy of hydrogen into usable electricity—can be widely affordable. And since conversion of energy is never 100 percent efficient, converting energy from electricity (from solar or wind, for example) to hydrogen for storage before converting it back to electricity for final use will inevitably entail significant inefficiencies.

The problems with hydrogen are so substantial that many analysts have by now concluded that its role in future energy systems will be limited (we are likely never to see a "hydrogen economy"), though for some applications it may indeed make sense.

Industrial societies already have an infrastructure for the delivery of electricity. Moreover, electricity enjoys some inherent advantages over fossil fuels: it can be converted into mechanical work at much higher efficiencies than can gasoline burned in internal combustion engines, and it can be transported long distances much more easily than oil (which is why high-speed trains in Europe and Japan run on electricity rather than diesel).

But if electricity is chosen as a systemic energy carrier, the problems with further electrifying transport using renewable energy sources such as wind, solar, geothermal, and tidal power remain: how to overcome the low energy density of electric batteries, and how to efficiently move electricity from remote places of production to distant population centers?[27]

ENERGY STORAGE AND TRANSMISSION

The energy densities by weight of oil (42 megajoules per kilogram), natural gas (55 MJ/kg), and coal (20 to 35 MJ/kg) are far higher than those of any electricity storage medium currently available. For example, a typical lead-acid battery can store about 0.1 MJ/kg, about one-fifth of 1 percent of the energy-per-pound of natural gas. Potential improvements to lead-acid batteries are limited by chemistry and thermodynamics, with an upper bound of less than 0.7 MJ/kg.

Lithium-ion batteries have improved upon the energy density of lead-acid batteries by a factor of about 6, achieving around 0.5 MJ/kg; but their theoretical energy density limit is roughly 2 MJ/kg, or perhaps 3 MJ/kg if research on the substitution of silicon for carbon in the anodes is realized in a practical way. On the other hand, supplies of lithium are limited, and therefore not scaleable.

It is possible that other elements could achieve higher energy storage by weight. In principle, compounds of hydrogen-scandium, if they could be made into a battery, could achieve a limit of about 5 MJ/kg. Thus the best existing batteries get about 10 percent of what is physically possible and 25 percent of the demonstrated upper bound.

Energy can be stored in electric fields (via capacitors) or magnetic fields (with superconductors). While the best capacitors today store one-twentieth the energy of an equal mass of lithium-ion batteries, a new company called EEstor claims a ceramic capacitor capable of 1 MJ/kg. Existing magnetic energy storage systems store around 0.01 MJ/kg, about equal to existing capacitors, though electromagnets made of high-temperature superconductors could in theory store about 4 MJ per liter, which is similar to the performance of the best imaginable batteries.

Chemical potential energy (a property of the atomic or molecular structure of materials that creates the potential for energy to be released and converted into usable forms—as is the case with fossil fuels and other combustible matter) can be stored as inorganic fuel that is oxidized by atmospheric oxygen. Zinc air batteries, which involve the oxidation of zinc metal to zinc hydroxide, could achieve about 1.3 MJ/kg, but zinc oxide could theoretically beat the best imagined batteries at about 5.3 MJ/kg.

Once again, hydrogen can be used for storage. Research is moving forward on building-scale systems that will use solar cells to split water into hydrogen and oxygen by day and use a fuel cell to convert the gases to electricity at night.[99] However, as discussed above, this technology is not yet economical.[100]

Better storage of electricity will be needed at several points within the overall energy system if fossil fuels are to be eliminated. Not only will vehicles need efficient batteries, but grid operators relying increasingly on intermittent sources like wind and solar will need ways to store excess electricity at moments of over-abundance for times of peak usage or scarcity. Energy storage on a large scale is already accomplished at hydroelectric dams by pumping water uphill into reservoirs at night when there is a surplus of electricity: energy is lost in the process, but a net economic benefit is realized in any case. This practice could be expanded, but it is limited by the number and size of existing dams, pumps, and reservoirs. Large-scale energy storage by way of giant flywheels is being studied, but such devices are likely to be costly.

The situation with transmission is also daunting. If large amounts of wind and solar energy are to be sourced from relatively remote areas and integrated into national and global grid systems, new high-capacity transmission lines will be needed, along with robust two-way communications, advanced sensors, and distributed computers to improve the efficiency, reliability, and safety of power delivery and use.

For the U.S. alone, the cost of such a grid upgrade would be $100 billion at a minimum, according to one recent study.[101] The proposed new system that was the basis of the study would include 15,000 circuit miles of extremely high voltage lines, laid alongside the existing electric grid infrastructure, starting in the Great Plains and Midwest (where the bulk of the nation's wind resources are located) and terminating in the major cities of the East Coast. The cost of building wind turbines to generate the amount of power assumed in the study would add another $720 billion, spent over a fifteen-year period and financed primarily by utilities and investors.

Yet, this hypothetical project would enable the nation to obtain only 20 percent of its electricity from wind by 2024. If a more rapid and complete transition away from fossil fuels is needed or desired, the costs would presumably be much higher.

However, many energy analysts insist that long high-capacity power lines would *not* be needed for a renewable energy grid system: such a system would best take advantage of regional sources—off-shore wind in the U.S. Northeast, active solar thermal in the desert Southwest, hydropower in the Northwest, and biomass in the forested Southeast. Such a decentralized or "distributed" system would dispense not only with the need for costly high-capacity power line construction but would also avoid fractional power losses associated with long-distance transmission.[99] Still, problems remain: one of the advantages of a continent-scale grid system for renewables would be its ability to compensate for the intermittency of energy sources like wind and solar. If skies are overcast in one region, it is likely that the sun will still be shining or winds blowing elsewhere on the continent. Without a long-distance transmission system, there must be some local solution to the conundrum of electricity storage.

TRANSITION PLANS

As noted above, there is an existing literature of plans for transitioning U.S. or world energy systems away from fossil fuels. It would be impossible to discuss those plans here in any detail, except to remark that some of those proposals include nuclear power[100] while some exclude it[101]. And some see a relatively easy transition to solar and wind[102], while others do not[103].

The present analysis, which takes into account EROEI and other limits to available energy sources, suggests first that the transition is inevitable and necessary (as fossil fuels are rapidly depleting and are also characterized by rapidly declining EROEI), and that the transition will be neither easy nor cheap. Further, it is reasonable to conclude from what we have seen that a full replacement of energy currently derived from fossil fuels with energy from alternative sources is probably impossible over the short term; it may be unrealistic to expect it even over longer time frames.

The core problem, which is daunting, is this: How can we successfully replace a concentrated store of solar energy (i.e., fossil fuels, which were formed from plants that long ago bio-chemically captured and stored the energy of sunlight) with a *flux* of solar energy (in any of the various forms in which it is available, including sunlight, wind, biomass, and flowing water)?

It is not within the purpose of this study to design yet another detailed transition plan. Such exercises are useful, but inevitably decisions about how much of a hypothetical energy mix should come from each of the potential sources (wind, solar, geothermal, etc.) depend on projections regarding technological developments and economic trends. The final plan may consist of a complex set of scenarios, with increasing levels of detail adding to the document's value as an analytical tool; yet all too often real-world political and economic events turn such scenarios into forgotten pipe-dreams.

The actual usefulness of energy transition plans is more to show what is possible than to forecast events. For this purpose, even very simple exercises can sometimes be helpful in pointing out problems of scale. For example, the following three scenarios for world energy, which assume only a single alternative energy source using extremely optimistic assumptions, put humanity's future energy needs into a sobering cost perspective.[104]

Scenario 1: The World at American Standards. If the world's population were to stabilize at 9 billion by 2050, bringing the entire world up to U.S. energy consumption (100 quadrillion BTU annually) would require 6000 quads per year. This is more than twelve times current total world energy production. If we assume that the cost of solar panels can be brought down to 50 cents per watt installed (one tenth the current cost and less than the current cost of coal), an investment of $500 trillion would be required for the transition, not counting grid construction and other ancillary costs—an almost unimaginably large sum. This scenario is therefore extremely unlikely to be realized.

Scenario 2: The World at European Standards. Since Europeans already live quite well using only half as much energy as Americans, it is evident that a U.S. standard of living is an unnecessarily high goal for the world as a whole. Suppose we aim for a global per-capita consumption rate 70 percent lower than that in the United States. Achieving this standard, again assuming a population of 9 billion, would require total energy production of 1800 quads per year, still over three times today's level. Cheap solar panels to provide this much energy would cost $150 trillion, a number over double the current world annual GDP. This scenario is conceivable, but still highly unlikely.

Scenario 3: Current per-Capita Energy Usage. Assume now that current world energy usage is maintained on a per-capita basis. If people in less-industrialized nations are to consume more, this must be compensated for by reduced consumption in industrial nations, again with the world's population stabilizing at 9 billion. In this case, the world would consume 700 quads of energy per year. This level of energy usage, if it were all to come from cheap solar panels, would require $60 trillion in investment—still an enormous figure, though one that might be achievable over time. (Current average per-capita consumption globally is 61 gigajoules per year; in Qatar it is 899 GJ per year, in the U.S. it is 325 GJ per year, in Switzerland it is 156 GJ per year, and in Bangladesh it is 6.8 GJ per year. The range is very wide. If Americans were to reduce their energy use to the world average, this would require a contraction to less than one-fifth of current consumption levels, but this same standard would enable citizens of Bangladesh to increase their per-capita energy consumption nine-fold.)

Of course, as noted above, all three scenarios are extremely simplistic. On one hand, they do not take into account amounts of energy already coming from hydro, biomass, etc., which could presumably be maintained: it would not be necessary to produce all needed energy from new sources. But on the other hand, costs for grid construction and electrification of transport are not included. Nor are material resource needs accounted for. Thus on balance, the costs cited in the three scenarios are if anything probably dramatically understated.

The conclusion from these scenarios seems inescapable: unless energy prices drop in an unprecedented and unforeseeable manner, the world's economy is likely to become increasingly energy-constrained as fossil fuels deplete and are phased out for environmental reasons. It is highly unlikely that the entire world will ever reach an American or even a European level of energy consumption, and even the maintenance of current energy consumption levels will require massive investment.



TABLE 4. ENERGY USE BY (SELECTED) COUNTRIES, 2006 *(Source: U.S. Energy Information Administration[iv])*

COUNTRY	Per capita energy use (Million Btu)	Total energy use (Quadrillion Btu)	COUNTRY	Per capita energy use (Million Btu)	Total energy use (Quadrillion Btu)
Afghanistan	0.6	0.018	Korea, South	193.4	9.447
Albania	34.3	0.123	Kuwait	469.8	1.136
Algeria	46.6	1.536	Laos	3.6	0.023
Angola	13.7	0.165	Lebanon	53.3	0.207
Argentina	79	3.152	Liberia	2.5	0.008
Australia	276.9	5.611	Libya	132	0.779
Austria	187.2	1.534	Lithuania	97	0.348
Bangladesh	5	0.743	Madagascar	2.2	0.042
Belgium	265.1	2.751	Malaysia	104.8	2.557
Benin	4.9	0.039	Mali	1.1	0.013
Bolivia	24.2	0.218	Mexico	68.5	7.357
Botswana	33.1	0.059	Mongolia	33	0.096
Brazil	51.2	9.635	Morocco	15.2	0.508
Bulgaria	121.5	0.897	Mozambique	10.6	0.218
Burkina Faso	1.3	0.019	Namibia	29.3	0.06
Burma (Myanmar)	5	0.236	Nepal	2.4	0.068
Cambodia	0.7	0.01	Netherlands	250.9	4.137
Cameroon	5	0.088	New Zealand	211.2	0.864
Canada	427.2	13.95	Nicaragua	12.8	0.071
Chad	0.3	0.003	Niger	1.3	0.017
Chile	77.6	1.254	Nigeria	7.8	1.023
China	56.2	73.808	Norway	410.8	1.894
Colombia	29.8	1.305	Pakistan	14.2	2.298
Congo (Kinshasa)	1.6	0.097	Peru	21.6	0.613
Costa Rica	43.6	0.178	Philippines	14.2	1.271
Croatia	92.1	0.414	Poland	100.1	3.856
Cuba	35.1	0.399	Qatar	1,023.3	0.906
Czech Republic	176.6	1.808	Romania	75.2	1.678
Denmark	161.3	0.879	Russia	213.9	30.386
Ecuador	31	0.42	Rwanda	1.4	0.013
Egypt	32.2	2.544	Saudi Arabia	255	6.891
El Salvador	19.2	0.131	Senegal	6.9	0.084
Estonia	175.2	0.232	Sierra Leone	2.8	0.017
Ethiopia	1.4	0.103	Singapore	476.8	2.142
France	180.7	11.445	Solomon Islands	5.4	0.003
Germany	177.5	14.629	Somalia	1.2	0.01
Ghana	7.1	0.159	South Africa	117.2	5.177
Greece	139.1	1.487	Spain	161.2	6.51
Greenland	149.3	0.008	Sri Lanka	10.5	0.218
Guatemala	16.3	0.202	Sudan	4.8	0.185
Guinea	2.4	0.023	Swaziland	15	0.017
Guyana	29.4	0.023	Sweden	245.8	2.216
Haiti	3.3	0.028	Switzerland	170.7	1.284
Honduras	17.3	0.127	Syria	42.9	0.81
Hong Kong	167.7	1.164	Taiwan	200.6	4.569
Hungary	114.7	1.145	Tanzania	2.1	0.08
Iceland	568.6	0.17	Thailand	57.9	3.741
India	15.9	17.677	Turkey	55.5	3.907
Indonesia	17.9	4.149	Uganda	1.2	0.035
Iran	118.2	7.686	Ukraine	125.9	5.871
Iraq	46.6	1.247	United Arab Emirates	577.6	2.464
Ireland	173.4	0.704	United Kingdom	161.7	9.802
Israel	123.5	0.848	United States	334.6	99.856
Italy	138.7	8.069	Uruguay	38.8	0.134
Japan	178.7	22.786	Venezuela	124.4	3.191
Jordan	52.2	0.308	Vietnam	16.6	1.404
Kazakhstan	195.3	2.975	Yemen	12.4	0.267
Kenya	5.6	0.202	Zambia	11.1	0.126
Korea, North	41.1	0.949	Zimbabwe	15	0.183



ANITA BOYSEN

In many cities of the world, there's a renaissance in bicycle travel, and new public accommodations to bicyclists: pathways, car-free roads and parks, new rules of the road that favor bicycles, bike racks on public busses, bike cars on commute trains, etc. All seem small-scale compared to the immensity of the energy crisis, but they create a "can do" spirit, self-reliance, and a transformational ethic, so other conservation steps—emphasis on light rail, dedicated bus lanes, fees for cars downtown, higher parking rates—begin to be practical. And it's fun and healthy.

Six

THE CASE FOR CONSERVATION

THE CENTRAL ISSUE REMAINS—how to continue supplying energy in a world where resources are limited and declining. The solution becomes much easier if we find ways to proactively *reduce* energy demand. And that project in turn becomes easier if there are fewer of us wanting to use energy (that is, if population shrinks rather than continuing to increase).

Based on all that we have discussed, the clear conclusion is that the world will almost certainly have considerably less energy available to use in the future, not more, though (regrettably) this strong likelihood is not yet reflected in projections from the International Energy Agency or any other notable official source. Fossil fuel supplies will almost surely decline faster than alternatives can be developed to replace them. New sources of energy will in many cases have *lower* net energy profiles than conventional fossil fuels have historically had, and they will require expensive new infrastructure to overcome problems of intermittency, as we have discussed.

Moreover, the current trends toward declining energy demand, combined with falling investment rates for new energy supplies (especially for fossil fuels), resulting from the ongoing global economic crisis, are likely to continue for several years, thus complicating both a general recognition of the problem and a coordinated response.

How far will supplies fall, and how fast? Taking into account depletion-led declines in oil and natural gas production, a leveling off of energy from coal, and the recent shrinkage of investment in the energy sector, it may be reasonable to expect a reduction in global energy availability of 20 percent or more during the next quarter century. Factoring in expected population growth, this implies substantial *per-capita* reductions in available energy. These declines are unlikely to be evenly distributed among nations, with oil and gas importers being hardest hit, and with the poorest countries seeing energy consumption returning to pre-industrial levels (with energy coming almost entirely from food crops and forests and work being done almost entirely by muscle power).

Thus, the question the world faces is no longer *whether* to reduce energy consumption, but *how*. Policy makers could choose to manage energy unintelligently (maintaining fossil fuel dependency as long as possible while making poor choices of alternatives, such as biofuels or tar sands, and insufficient investments in the far more promising options such as wind and solar). In the latter case, results will be catastrophic. Transport systems will wither (especially ones relying on the most energy-intensive vehicles—such as airplanes, automobiles, and trucks). Global trade will contract dramatically, as shipping becomes more costly. And energy-dependent food systems will falter, as chemical input and transport costs soar. All of this could in turn lead to very high long-term unemployment and perhaps even famine.

However, if policy makers manage the energy downturn intelligently, an acceptable quality of life could be maintained in both industrialized and less-industrialized nations at a more equitable level than today; at the same time, greenhouse gas emissions could be reduced dramatically. This would require a significant public campaign toward the establishment of a new broadly accepted conservation ethic to replace current emphases on never-ending growth and over-consumption at both personal and institutional-corporate levels. We will not attempt here a full list of the needed shifts, but they might well include the following practical, engineering-based efforts:

- Immediate emphasis on and major public investment in construction of highly efficient rail-based transit systems and other public transport systems (including bicycle and pedestrian pathways), along with the redesign of cities to reduce the need for motorized human transport.[109]
- Research, development, and construction of electricity grid systems that support distributed, intermittent, renewable energy inputs.
- Retrofit of building stock for maximum energy efficiency (energy demand for space heating can be dramatically reduced through super-insulation of structures and by designing to maximize solar gain).[110]
- Reduction of the need for energy in water pumping and processing through intensive water conservation programs (considerable energy is currently used in moving water, which is essential to both agriculture and human health).[111]

As well, the following policy-based initiatives will be needed:

- Internalization of the full costs of energy to reflect its true price. Elimination of perverse energy subsidies, especially all upstream and production-side state support. Encourage government "feed-in tariffs" that favor ecologically sustainable renewable energy production.
- Application of the ten energy assessment criteria listed in this document to all energy technologies that are currently being proposed within the UN climate negotiations, for "technology transfer" from rich countries to poor.
- Re-localization of much economic activity (especially the production and distribution of essential bulky items and materials) in order to lessen the need for transport energy[112]; correspondingly, a reversal of the recent emphasis on inherently wasteful globalized economic systems.
- Rapid transition of food systems away from export oriented industrial production, toward more local production for local consumption, thus reducing mechanization, energy inputs, petro-chemicals and transport costs. Also, increased backing for permaculture, and organic food production. And, firm support for traditional local Third World farming communities in their growing resistance to industrial export agriculture.
- A major shift toward *re-ruralization*, i.e., creating incentives for people to move back to the land, while converting as much urban land as possible to sustainable food production, including substantial suburban lands currently used for decorative lawns and gardens.
- Abandonment of *economic growth* as the standard for measuring economic progress, and establishment of a more equitable universal standard of "sufficiency."
- Increase of reserve requirements on lending institutions to restrain rampant industrial growth until price signals are aligned to reflect full costs. Restrictions on debt-based finance.
- Development of indicators of economic health to replace the current GDP calculus with one that better reflects the general welfare of human beings.
- *Re-introduction* of the once popular "import substitution" (from the 1930s) model whereby nations determine to satisfy basic needs—food, energy, transport, housing, healthcare, etc.—*locally* if they possibly can, rather than through global trade.
- Establishment of international protocols on both energy assessment (including standards for assessing EROEI and environmental impacts) and also technology assessment. The latter should include full lifecycle energy analysis, along with the prin-

ciples of "polluter pays" and the "precautionary principle."

- Adoption of international depletion protocols for oil, gas and coal—mandating gradual reduction of production and consumption of these fuels by an annual percentage rate equal to the current annual depletion rate, as outlined in the present author's previous book, *The Oil Depletion Protocol*, so as to reduce fuel price volatility.
- Transformation of global trade rules to reward governments for, rather than restraining them from, protecting and encouraging the localization of economic production and consumption patterns.
- Aggressive measures for "demand-side management" that reduce overall energy needs, particularly for power grids. This would be part of a society-wide "powering down," i.e., a planned reduction in overall economic activity involving energy, transport and material throughputs, emphasizing conservation over new technology as the central solution to burgeoning problems.
- International support for women's reproductive and health rights, as well as education and opportunity, as important steps toward mitigation of the population crisis, and its impact on resource depletions.
- The return of control of the bulk of the world's remaining natural resources from corporations and financial institutions in the industrialized countries to the people of the less industrialized nations where those resources are located.

The goal of all these efforts must be the realization of a no-growth, *steady-state* economy, rather than a growth-based economy. This is because energy and economic activity are closely tied: without continuous growth in available energy, economies cannot expand. It is true that improvements in efficiency, the introduction of new technologies, and the shifting of emphasis from basic production to provision of services can enable some economic growth to occur in specific sectors without an increase in energy consumption. But such trends have inherent bounds. Over the long run, static or falling energy supplies must be reflected in economic stasis or contraction. However, with proper



planning there is no reason why, under such circumstances, an acceptable quality of life could not be maintained.[13] For the world as a whole, this might entail the design of a deliberate plan for global redistribution of energy consumption on a more equitable basis, with industrial nations reducing consumption substantially, and less-industrial nations increasing their consumption somewhat in order to foster global "sufficiency" for all peoples. Such a formula might partly make up for centuries of colonial expropriation of the resources of the world's poor countries, a historical factor that had much to do with the rapid industrial growth of the wealthy resource-hunting countries during the past 150 years. Addressing this disparity might help provide the poorer countries a chance for survival, if not equity.

Here's some good news: A considerable literature exists on how people in recently affluent nations can reduce energy consumption while actually increasing levels of personal satisfaction and community resilience.[14] The examples are legion, and include successful community gardens, rideshare, job-share, and broad local investment and conservation programs, such as Jerry Mander briefly mentions in the Foreword, including most notably the Transition Towns movement that is now sweeping Europe and beginning in the U.S. as well.



While the subject is, strictly speaking, beyond the scope of this booklet, it must also be noted and underscored that global conservation efforts are and will be required with regard to *all* natural resources (not just energy resources). The Earth's supplies of high-grade ores are limited, and shortages of a wide range of minerals, including phosphorus, coltan, and zinc, are already occurring or expected within the next few decades if current consumption patterns continue. Deforestation, loss of topsoil due to erosion, and the (in many cases) catastrophic and irreversible decline of wild fish species in the oceans are also serious problems likely to undermine economic activity and human well-being in the years ahead. Thus, all standard operating assumptions about the future of industrial society are clearly open to doubt.

Societal adaptation to resource limits inevitably also raises the question of population. When population grows but the economy remains the same size, there are fewer economic goods available per person. If energy and material constraints effectively impose a cap on economic growth, then the only way to avert continuing declines in per-capita access to economic goods is to limit population by, for example, providing economic incentives for smaller families rather than larger ones (Note: in the United States larger families are now rewarded with lower taxes), as well as easy access to birth control, and support for poor women to obtain higher levels of education. Policy makers must begin to see population shrinkage as a goal, rather than an impediment to economic growth.

In his book *Energy at the Crossroads*[19], Vaclav Smil shows the relationship between per capita energy consumption and various indices of well-being. The data appear to show that well-being requires at least 50 to 70 GJ per capita per year. As consumption above that level slightly expands, a sense of well being also expands, but only up to about 100 GJ per capita, a "safety margin" as it were. Remarkably however, above and beyond that level of consumption, there is no increase in a sense of well being. In fact the more consumptive and wealthy we become, the less content and satisfied we apparently are. One wonders whether the effort needed to expand material wealth and consumption have their own built-in dissatisfactions in terms of challenges to free time, added daily pressures, reduced family contact, engagement with nature, and personal pleasures. North America's energy consumption is currently about 325 GJ per annum. Using these indices as goals, and with a general notion of the total amount of energy that will be available from renewable energy sources, it should then be possible to set a target for a population size and consumption levels that would balance these factors.

Energy conservation can take two fundamental forms: curtailment and efficiency. *Curtailment* describes situations where uses of energy are simply discontinued (for example, we can turn out the lights in rooms as we vacate them). *Efficiency* describes situations where less energy is used to provide an equivalent benefit (a related example would be the replacement of incandescent bulbs with compact fluorescents or LEDs). Efficiency is typically preferred, since few people want to give up tangible benefits, but efficiency gains are subject to the law of diminishing returns (the first ten percent gain may be cheap and easy, the next ten percent will be somewhat more costly, and so on), and there are always ultimate limits to possible efficiency gains (it is impossible to light homes at night or to transport

goods with zero energy expenditure). Nevertheless, much could be achieved over the short term in energy efficiency across all sectors of the economy.

Curtailment of use is the quickest and cheapest solution to energy supply problems. Given the reality that proactive engagement with the inevitable energy transition has been delayed far too long, curtailment (rather than efficiency or replacement with alternative sources) will almost certainly need to occur, especially in wealthy nations. But even granting this, proactive effort will still be crucial, as planned and managed curtailment will lead to far less societal disruption than ad hoc, unplanned curtailment in the forms of electrical blackouts and fuel crises.

The transition to a steady-state economy will require a revision of economic theories and a redesign of financial and currency systems.[176] These efforts will almost certainly be required in any case if the world is to recover from the current economic crisis.

Realistic energy descent planning must begin at all levels of society. We must identify essential economic goods (obviously including food, water, shelter, education, and health care) and decouple these from discretionary consumption that in recent decades has been encouraged merely to stoke economic growth.

The UN negotiations on climate change leading up to the Copenhagen climate summit in December 2009, have presented an opportunity for the world to consider the centrality of energy conservation in cutting greenhouse gases, yet it is barely part of the official UN climate agenda. Much of the current policy discussion misguidedly focuses on expanding renewable energy sources, with little to no consideration of their ecological, economic, and practical limits. Energy efficiency is receiving increasing attention, but it must be seen as part of a clear conservation agenda aimed at reducing global demand for energy overall.

Surprisingly, a recent US-China memorandum of understanding on energy and climate listed conservation as its top bullet point among shared concerns. If the world's two largest energy consumers in fact believe this is their top priority, then it needs to come to the fore in global climate discussions.

However, the mandate of the UN climate talks does not include an official multilateral process to cooperate on energy descent. Negotiators increasingly express concern over energy supply issues but are without an international forum in which to address them.

The national security community appears now to take seriously threats related both to climate change and energy supply vulnerability. This could set a new context for post-Copenhagen international efforts to address these collective concerns so as to avoid violent conflict over depleting energy resources and climate disaster.

* * *

Our energy future will be defined by limits, and by the way we respond to those limits. Human beings can certainly live within limits: the vast majority of human history played out under conditions of relative stasis in energy consumption and economic activity; it is only in the past two centuries that we have seen spectacular rates of growth in economic activity, energy and resource consumption, and human population. Thus, a deliberate embrace of limits does not amount to the end of the world, but merely a return to a more normal pattern of human existence. We must begin to appreciate that the 20th century's highly indulgent, over-consumptive economic patterns were a one-time-only proposition, and cannot be maintained.

If the energy transition is wisely managed, it will almost certainly be possible to maintain, within this steady-state context, many of the benefits that our species has come to enjoy over the past decades—better public health, better knowledge of ourselves and our world, and wider access to information and cultural goods such as music and art.

As society adopts alternative energy sources, it will at the same time adopt new attitudes toward consumption, mobility, and population. One way or another, the transition away from fossil fuels will mark a turning point in history as momentous as the Agricultural Revolution or the Industrial Revolution.

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LOU DEMATTEIS

A familiar sight from Chevron and Texaco oil development in the Ecuadorian Amazon: giant oil fires in open waste pits.

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GLOBAL ENERGY QUANDARY

THE DESIGNERS OF THE GLOBAL ECONOMY sold us visions of never-ending growth, wealth, and abundance. But now, limits are everywhere apparent. Energy resources are fast dwindling, their prices ever more volatile, their uses more obviously destructive. After a century of indulgence, the party is over. Optimists say that new technology will save us; alternative energy systems will replace current ones. Economic growth will go on forever. *Is this true? Or are we singing old anthems on the deck of the Titanic?*

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Tom Whipple, Editor
Sharon Astyk, Commentary Editor

October 24, 2011

1. Oil and the Global Economy

For another week the global oil markets were largely driven by the prospects for settling the EU's sovereign debt crisis. The price rise which began in early October, taking Brent crude from $98 a barrel to the neighborhood of $112, continued through Wednesday when it became clear that negotiations between France and Germany over the debt crisis were at an impasse. Prices then fell with Brent closing out the week at $109.56 and NY oil at $87.40.

Although limited amounts of oil are now being exported from Libya, global markets remain tight, which is why OPEC is still averaging $108 a barrel for its oil. The death of Gadhafi last week brought to a close another chapter in the Arab uprising. The next few months will see whether the Libyans can form a government with enough strength to organize and provide security for oil production or whether disagreements among the various tribes, cities, and other factions will prevent Libyan oil exports from reaching significant levels in the next year or so. Some engineers are already talking about the damage that might have been done to the pressure of Libyan oil fields by the emergency shutdowns they underwent.

US commercial petroleum inventories fell by an unusually large 11 million barrels the week before last adding more credence to the IEA assertion that the world currently is burning more oil and other liquids than it is producing. Global stocks are still about 2.6 billion barrels so the drawdown can still go on for some time without much effect. Global oil prices have been trading over a $15 a barrel range centered on $110 since late spring. This price range is some $25 dollar a barrel higher than where oil traded for most of 2010 and is clearly exacting a toll on many economies.

The announcement that US combat forces will not be remaining in Iraq after the end of the year raises once again the question of whether the government will be able to provide sufficient security to allow major increases in oil production. Assassinations, bombings, and sabotage of oil facilities still take place on a regular basis. Increasing tensions in the region stemming from the Syrian, Bahraini, Yemeni, and Kurdish uprisings, and the numerous issues between Iran and many other states, all suggest that exploiting the world's last major deposit of cheap and easy to extract oil may not be all that easy.

A meeting of oil ministers in Paris last week provided the venue for a number of interesting assertions by senior officials of the IEA. The Agency believes that: the growth in oil demand would be "largely wiped out" by a double-dip recession; that the ongoing unrest in the Middle East might lead to underinvestment in oil production and higher prices in the year ahead; it is almost too late to limit global temperature increases to 2° C.; the world is faced with a dire future in which the average global temperatures rise by more than 3.5 C unless there are major innovations to lower the cost of clean energy and lower carbon emissions; and that they see less potential for an oil price spike in the next few months than they did a few months ago due to slowing economies.

2. The EU debt crisis

Most observers agree that a quick settlement to the EU's sovereign debt crisis is vital to continued global economic stability. Unless a way is found to heal permanently the hemorrhaging of Greece's economy, the problem will spread to the major European banks that hold the Greek debt and from there to Spain, Italy, Belgium and eventually France. Even Wall Street is threatened due to the massive credit default swaps it holds on Europe's debt. Taken to the extreme, the situation could ultimately result in severe damage to the global banking system and a major world-wide depression. In such a situation the significance of peaking global oil supplies likely would be lost in the midst of plummeting demand for oil.

Europe's leaders clearly understand the danger of the situation and are scrambling to find a solution that is not easily coming. Greece's economy seems to be in a death spiral with its people unwilling to make the sacrifices demanded by the rest of the EU and its deficits continuing to grow. A split has developed between Germany and France which are the only Eurozone countries large enough to affect a bailout. France, whose banks are heavily invested in Greece and other threatened Eurozone economies and would be damaged, if not wiped out, by widespread defaults, is seeking to solve the problem with European and global money rather than using its government credit to support French banks.

Germany has already committed $290 billion to a bailout fund for Greece, Portugal, and Ireland, and its voters are tired of bailing out what they see as bad financial management by other Eurozone members. Berlin, under pressure from the parliament, is refusing to bail out what it considers to be poor loans made by banks in other counties. The search for a solution jumps around from large write downs in the bad debts to various schemes to inflate European Financial Stability Facility (EFSF). So far all proposals have serious problems and serious opposition which is why the problem continues to be pushed ahead despite the urgency of the situation.

Despite constant incantations of optimism from various European leaders, which serve to push up the equity markets and the price of oil, many observers believe the debt situation has become so massive and complex that it is insoluble on more than a temporary basis. While some agreement may be cobbled together in the next week or two, it seems likely the underlying problem will around is some form or other for many years.

3. US oil consumption

As the world's largest consumer of oil products, just what is happening to oil consumption in the United States is always of interest. A new study says US drivers will spend about $490 billion filling their gas tanks this year which will be up by more than $100 billion over 2010. Three years ago when average gasoline prices got over $4 a gallon, demand for gasoline fell by only 3 percent. These high gasoline prices have become a part of life and not just a brief up and down as in 2008. Despite oil prices that have been running 60-80 cents a gallon higher than last year, gasoline consumption is only down some 1.3 percent last month from September 2010.

It seems that most drivers can't or won't reduce their fuel consumption and are taking the extra $100 billion from other purchases. Many say they are cutting back on food expenditures as they have few other options. America seems to be running into an "elasticity wall" at which lifestyles and lack of alternative transportation choices are keeping Americans in their cars right down to the end of their resources.

The API is reporting that total US petroleum imports fell by nearly 10 percent in September reflecting a 5 percent increase in domestic production during the last four weeks over last year as well as the continuing drawdown in US stocks which were 5.3 percent lower than a year earlier. It is possible that the general tightness of the global market without Libyan production and various reductions in non-OPEC production is making it more difficult for US refiners to find crude to import.

The API is also reporting a surge in the demand for distillates in September which recently has been running nearly 6 percent higher than last year. As it is difficult to see an increase of this size being consumed by a moribund US economy, it is likely that much of the increased demand for distillates is being exported. US oil product exports this year are up 24 percent over 2010. With global conventional oil production flat, much of the increase in demand is being satisfied by natural gas liquids and ethanol which are not substitutes for distillates.

If current trends continue, it is likely that we are going to see increasingly higher prices for distillates – diesel, fuel oil, and jet fuels – and that the availability of these oil products may become an issue before that of gasoline.

4. Fracking for gas

There was news on the fracking front last week as new rules were issued to control fracking of natural gas shale. As shale gas has come to be seen in many quarters as the salvation for the nation's problems by providing clean cheap energy, jobs, and tax revenues, the new rules are likely to become controversial as the industry seeks to have them overturned.

The EPA announced that it will issue national shale wastewater rules under the Clean Water Act that will set standards that drillers must meet before sending water that has been extracted from fracked wells to waste water facilities for treatment. It currently is illegal to discharge untreated waste water from fracking into streams or bodies of water. This move is separate from an ongoing study of the effects of fracking on drinking water. The new rules are to come into force in 2014.

While New York's temporary ban on drilling ended last week, the new rules issued with the lifting of the ban will prove to be onerous for many drilling companies unless they are modified. The new rules, which are expected to come into force next year, establish buffer zones around waterways and aquifers that are as much as 20 times wider than those found in fracking-friendly Pennsylvania. The rules would prohibit drilling within 500 feet of the state's 18 primary aquifers, within 4000 feet of the NY City and Syracuse watersheds and within 2000 feet of rivers and streams. NY City is also proposing that drilling be banned within seven miles of the aged underground aqueducts that bring water to major cities.

Numerous drilling companies already hold leases on tens of thousands of acres that would be closed under the new rules. After a 90-day comment period, the new regulations could be finalized and new drilling permits could be issued by mid-2012.

Quote of the week

- "Most economists view the economic growth of the last century and a half as being fueled by ongoing technological progress. Without question, that progress has been most impressive. But there may also have been an important component of luck in terms of finding and exploiting a resource that was extremely valuable and useful but ultimately finite and exhaustible. It is not clear how easy it will be to adapt to the end of that era of good fortune."

  -- James D. Hamilton

The Briefs (clips from recent *Peak Oil News* dailies are indicated by date and item #)

- California regulators have approved North America's first **cap-and-trade** program, setting limits on carbon emissions. The move represents the world's second-largest carbon control program after the European Union. (10/22, #14)
- U.S. officials have approved the first offshore oil-exploration plan submitted by **BP** since the Deepwater Horizon oil spill. (10/22, #17)

- Increasingly, **Iraq's** drive to expand its oil and natural gas industry, the country's economic lifeline, is becoming dependent on the government's ability to ensure security and, without US forces that looks to be a serious problem. (10/21, #8)
- **Lukoil** and its partners are poised to award a numerous contracts to international engineering and construction companies as it moves full speed ahead with development of its supergiant West Qurna Phase 2 in southern Iraq. (10/21, #9)
- **ExxonMobil, BP, and Eni** will spend around $100 billion to upgrade three oil fields in southern Iraq. About $50 billion would be spent to upgrade the big West Qurna Phase 1 oil field which is being developed by Exxon. The remaining $50 billion will be spent by BP and Eni to upgrade the Rumaila and Zubair oil fields, respectively. (10/20, #7)
- **Iraq** has agreed with oil majors to build a multi-billion-dollar oil field water injection plant in the south of the country, after disagreement over costs that suspended the project for months. (10/20, #8)
- **Iraq** is driving to build new oil refineries to increase capacity by 740,000 b/d as its postwar economy swells, part of a multibillion-dollar program under way across the Persian Gulf region. (10/20, #9)
- **Iraq's** crude oil production is expected to hit some 3 million b/d by the end of October from the current 2.9 million--the highest level reached since the US-led invasion in 2003. (10/18, #7)
- President **Chávez** of Venezuela declared on Thursday that he had beaten cancer, less than five months after revealing that he had undergone emergency surgery to remove a tumor while in seclusion in Cuba. (10/21. #11)
- **Statoil** announced its giant North Sea discovery Aldous Major South is estimated to contain double the volume compared with previous estimates. (10/21, #14)
- A Japanese industrial company aims to test a new **tidal power system** at an energy center in the north of Scotland. (10/21, #20)
- **India and Russia** signed deals to work closer with the IEA on energy matters. The International Energy Agency sponsored a meeting in Paris that focuses on energy security and sustainability, as well as closer engagement with non-member states. (10/20, #5)
- **Eni** has made a very large natural-gas discovery off the coast of Mozambique, big enough that it could turn the East African country into a major exporter of gas to Asia. (10/20, #11)
- China's largest **rare earths** producer is suspending production for a month in a move to force prices up. (10/18, #17) (10/20, #13)
- The **Gas Exporting Countries** Forum won't become a cartel like OPEC because it won't impose production quotas on its members, said Russia's Deputy Energy Minister Anatoly Yanovsky. (10/19, 6)
- Russian Prime Minister Putin has told his Japanese counterpart Yoshihiko Noda that Moscow hopes to advance **energy cooperation** with Tokyo in areas including LNG and possible electricity supplies to the gas- and power- hungry nation. (10/17, #16)
- **Japan** is considering revising plans to cut carbon dioxide emissions by 25 percent by 2020 due to a rethink of its energy future. The country is worried that it is spending too much on carbon credit programs. (10/19, #12)
- The **EU** is for the first time clearly questioning whether it should press ahead with long-term plans to cut greenhouse-gas emissions if other countries don't follow suit. This could herald a significant policy shift for a region that has been at the forefront of advocating action to combat climate change. (10/19, #17)

- A bill passed by the US Senate ensures the American public isn't in danger of **gas pipelines** "exploding under their feet," a California lawmaker said. (10/19, #14)
- US officials are trying to make sure the American coastline will be protected as **Cuba** begins drilling a deep water oil well later this year about 60 miles off the Florida Keys. (10/17, #8)
- **China's** hydropower output dropped 24.5 percent year-on-year to 56.87 billion kilowatt-hours (kwh) in September as a result of decreased runoff from major rivers. (10/17, #9)
- **BP** reached a $4 billion out-of-court settlement with Anadarko Petroleum Corp. to settle claims related to the deadly explosion and oil spill at a U.S. offshore drilling platform. (10/17, #13)
- Kinder Morgan Inc.'s agreement to buy El Paso Corp. (EP) for $21.1 billion, the energy industry's biggest transaction in more than a year, would create the largest natural-gas **pipeline network** in the U.S. (10/17, #15)

Commentary: Oil and the Economy

By Chris Martenson

(Note: Commentaries do not necessarily represent the position of ASPO-USA.)

By itself, the concept of having to get by on just a little bit less oil each year seems to be manageable enough. Some think that a steadily, or even sharply, rising price will merely reduce demand and promote exploration and that everything will more or less normally work itself out through well understood market mechanisms. Perhaps it will, but I think the odds are stacked against a smooth transition to a future of less net energy.

The critical fact is this: Because all money is loaned into existence, our economy requires perpetual growth to function. The purpose of this article is not to opine on whether this is a good or a bad system, but merely to describe it and the risks it carries by virtue of its design.

With constant economic growth, our money system is relatively happy; without growth, it becomes utterly despondent. Without constant economic growth, preferably in the range of 3% (or more!), the collective pile of debts cannot be serviced out of new growth and so they begin to default.

This is exactly the dynamic that has been exposed and now is in play in Europe and, if my guesses are correct, will soon visit the very core of the thin-air money machine, the US itself.

That's the difference between growth and shrinkage in our world economy. Night and day. Life and death. If this strikes you as a rather fragile and unsustainable way to construct an economy, then you are not alone. After all, how can anything grow forever?

The key takeaway here is this: Our economy must grow in order to function.

Oil & the Economy

When I have the opportunity to present to and interact with people who are one the economic/financial side of the equation, they very rarely understand - truly understand - the energy side of the equation. You know, the not-so-subtle difference between total energy and net energy, and the fact that the first and second laws of thermodynamics have never been broken.

And in reverse, I often find that people in the energy camp do not really appreciate how the economy functions, and that it is really a complex system with multiple nested feedback loops predicated upon growth. In my view, each camp would benefit from spending a little bit more time in the other camp because both are really making some very profound assumptions.

The economic folks are assuming that energy will somehow be found and brought to market and the energy folks are assuming that the economy will be there to support their capital and technology-intensive efforts. Neither of these assumptions are very helpful if they help us overlook the potential disruption that declining net energy could unleash within our economy.

To return to the idea of our economy as a complex system for a minute. The field of complexity research is pretty robust and understands the basic principles of the coupling between energy flows and complexity. Whether the complex system being studied is a wave encountering the shore, a pile of sand, or an economy; the same fundamental rules seem to apply. Maintaining complexity requires energy while increasing complexity requires more energy.

At this point I have to confess that my earlier description of the economy was woefully narrow. Yes, it is a nested system with multiple feedback loops, but those in turn are interconnected with political, social and cultural systems, each of which are themselves complex systems. It is in the largest sense that we must consider the impact of declining net energy on the complexity and behaviors of our most critical systems.

To make things even more uncertain, another feature of complex systems is that they are inherently unpredictable. When an event might occur, or how big that event might be, are both unknowable, whether it is the size and timing next earthquake on an overdue fault or the vigor and demands of the social uprising we are talking about. Complex systems are frequently tightly coupled and little events cascade and become larger events; the so-called butterfly effect.

My view here is that a decline in net energy will disrupt the economy, and other interlocking systems, in ways that are both unknowable and larger than expected by most.

Six Inches Thick

Recently there was a revealing AP story about coal seams in Kentucky being chased that were only six inches thick. Revealing because it tells us a lot about where we are in the net energy story.

Those managing pensions with 30 year investment horizons should be thinking really hard about those six inch coal seams. They should ponder what it means that half of all the oil ever burned has been burned over the past 22 years and wonder about where the supplies will come from to fund the next 22 years.

In fact all of us should; what we assume to be the way the world works, and the way all of those interlocking complex systems function, is a very, very recent development historically speaking and can continue if, *and **only** if*, the amount of available surplus energy continues to grow.

This is not an idle concern, but one that will shape our futures by shaking our monetary and economic systems to the core. Such is the nature of complex systems starved of the requisite amount of energy required to both maintain and advance the current level of complexity.



The implications for stocks, bonds, and every other growth-dependent investment class are enormous. In aggregate they will fall in value. Whether dollars, euros or yen are depreciated or inflated in value does not matter, either way stocks and bonds will be worth less than they currently are because the growth premium will be reduced or eliminated.

(Source - http://www.multpl.com/s-p-500-dividend-yield/)

To make things just a little bit darker for equities today is the fact that from a historical perspective dividend yields are quite unattractive and reversion to the mean is the better bet:

Historically, truly compelling equity yields are in the vicinity of 10% but even the long term average is more than double the current yield. The two ways to bring the dividend yield back into the historical fold are for prices to fall by half or dividends to be doubled.

Unless a massive earnings binge is expected, which rising energy costs render difficult if not impossible, the 'fall by half' option is the more likely outcome. How could equities fall by half? One way would be to keep the dollar constant and let the prices fall. This is the more obvious method. The other way is to debase the currency and let the purchasing power of stocks erode by half while holding their nominal prices constant. If that sounds tricky, it is exactly what has happened over the prior thirteen years where the S&P is now trading at the exact same level it was back then. Inflation has been anything but absent over that same period and this is how printing money in the face of declining net energy (and an enormous credit bubble popping) will deliver to us smaller returns even as the tried and formerly true monetary levers are pulled and pulled again in search of a response we can recognize.



The bottom line here is that everything we think we know about investing and how the world works is challenged by the pesky reality of energy sources that are dwindling in both quantity and quality. The days of pulling magic monetary and fiscal levers and then having the resources magically appear are over. A new and more complex future has arrived.

Unfortunately the experience set of practically everyone currently with their hands on these levers does not extend to energy, physics, the laws of thermodynamics, or anything outside of the tidy but woefully incomplete world of economics.

Our job, then, is to assess for ourselves what the nature, duration, and size of the economic disruptions might be that result from steadily squeezing the available amount of net energy that all these complex systems are supported by.

Whatever the answer each person or entity arrives at, whether that is "there's nothing to worry about," or something dire, is perfectly fine as long as a comprehensive, data rich conversation and/or debate is held. The time for holding assumptions and beliefs is over. It is time to broaden our views, wander into the neighboring camps, and see what we can learn from each other.

Chris Martenson (@chrismartenson) speaks twice at the 2011 ASPO-USA Conference. First, Thursday Nov. 3 at the Congressional Auditorium inside the U.S. Capitol. Then later that afternoon in a session titled "Of Wells and Wall Street." Dr. Martenson is the author of a "The Crash Course: The Unsustainable Future of Our Economy, Energy and Environment" published by Wiley and now available in bookstores. His website, Chrismartenson.com, reaches a wide and growing audience of individuals interested in how to navigate the coming times with an eye towards preserving capital and mitigating risks.

The Olduvai Theory

Energy, Population, and Industrial Civilization

by Richard C. Duncan

Abstract

The Olduvai Theory states that the life expectancy of industrial civilization is approximately 100 years: circa 1930-2030. Energy production per capita *(e)* defines it. The exponential growth of world energy production ended in 1970 (Postulate 1 is verified). Average *e* will show no growth from 1979 through circa 2008 (Postulate 2 is confirmed from 1979 through 2003). The rate of change of *e* will go steeply negative circa 2008 (Postulate 3). World population will decline to about two billion circa 2050 (Postulate 4). A growing number of independent studies concur (see text).

[Key Words*: Olduvai Theory; Henry Adams; energy and population; exponential growth; permanent blackouts; overshoot and collapse.*]

Introduction

The Olduvai Theory states that the life expectancy of industrial civilization is approximately 100 years: circa 1930-2030. It is defined by the ratio of world energy production and population *(e)*. Four postulates follow:

1. The exponential growth of world energy production ended in 1970.
2. Average *e* will show no growth from 1979 to circa 2008.
3. The rate of change of *e* will go steeply negative circa 2008.
4. World population will decline proximate with *e*.

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This paper accomplishes four goals:

The first goal is to show that from 1893 through 1949 three distinguished scholars formulated a comprehensive Olduvai scenario.

The second goal is threefold: 1) electrical power is crucial end-use energy for industrial civilization;[1] 2) the big blackouts are inevitable; and 3) the proximate cause of the collapse of industrial civilization, if and when it occurs, will be that the electric power grids go down and never come back up.

I first presented the Olduvai Theory at an engineering conference entitled, "Science, Technology, and Society" (Duncan, 1989). My paper was well received and a lengthy discussion followed — even though I had no data to support it at the time. A few years later I had gathered eight (8) historical data points to backup the theory (Duncan, 1993). Three years after that I showed that it held up against the world energy and population data from 1950 to 1995 (Duncan, 1996). Next tested in 2000, the theory was supported by data from 1920 to 1999 (Duncan, 2000, 2001). The third goal of this paper is to extend this series of tests by using data from 1850 through 2003.

The fourth goal is twofold: 1) detail and describe the Olduvai Theory from 1930 to 2030, and 2) document that a growing number of studies concur with Postulate 4.

Three Scouts

> *There is no comprehensive substitute for oil in its high-energy density, ease of handling, myriad end-uses, and in the volumes in which we now use it. The peak of world oil production and then its irreversible decline will be a turning point in Earth history with worldwide impact beyond anything previously seen. And that event will surely occur within the lifetimes of most people living today.* (Youngquist, 2004)

An Olduvai scenario of industrial society was envisioned by historian Henry Adams in 1893, quantified by architect Frederick Ackerman in 1932, and graphed by geophysicist King Hubbert in 1949. A summary follows.

HENRY ADAMS, Historian (1838-1918) – great grandson of the second President and grandson of the sixth: I first became aware of Henry Adams' work in 2002 while reading David E. Nye's masterpiece *Electrifying America.*

Henry Adams defined energy broadly to include not only steam engines or electricity but also any force capable of organizing and directing people.

> *Adams concluded that electrification was part of a larger process of historical acceleration, which would lead to an inevitable social decline. … It seemed probable that the ultimate result of exploiting new energy systems would be the apocalyptic end of history itself.* (Nye, 1990, p. 142-3)

Adams' goal was to discover a succinct law of history as outlined in his book *The Education of Henry Adams* (Adams, 1907). It was at the Chicago World's Fair in 1893 where he first theorized that "forces totally new" – especially electric power and incandescent lighting – would "accelerate society into chaos and ruin."

> *The new American – the child of incalculable coal-power, chemical power, electric power, and radiating energy, as well as of new forces yet undetermined – must be a sort of god compared with any former creation of nature. … The new forces would educate. … The law of acceleration was definite … No scheme could be suggested to the new American, and no fault needed to be found, or complaint made; but the next great influx of new forces seemed near at hand, and its style of education promised to be violently coercive.* (Adams, 1907, Chap. 34)

Ernest Samuels (1973) edited Adams' book and forcefully summed it up.

> *Even in his own day he saw the eighteenth century American dream of unlimited opportunity and indefinite progress turning into a waking nightmare of the moral dilemmas of a capitalist society. He saw too that though science was indeed making tremendous advances in the conquest of Nature, winning every battle in that age-old contest, the odds were growing that a dehumanized mankind might lose the war.* (p. vii)

Henry Adams' farsightedness was and is amazing. He is buried in Rock Creek Cemetery in Washington, DC and his ideas are now resonating worldwide – but not yet in the U.S. capital.

FREDERICK LEE ACKERMAN, Architect (1878-1950): In 1919, Ackerman was a founding member of the Technical Alliance (later Technocracy Inc.). The group consisted of a broad spectrum of eminent professionals. In 1932 Ackerman published his seminal paper "The Technologist Looks at the Depression" wherein he – like Henry Adams before – observed that new energies were accelerating social change.

From about 4000 B.C.E. to 1750 C.E., Ackerman noted, the common welfare was limited to the work that man could do with his hands and a few crude tools.

Whence the Name 'Olduvai'?

Olduvai Gorge is an archaeological site in the eastern Serengeti Plains in northern Tanzania. The gorge is a very steep-sided ravine roughly 30 miles long and 295 ft. deep. Exposed deposits show rich fossil fauna, many hominid remains and items belonging to one of the oldest stone tool technologies, called Olduwan. The objects recovered date from 2,100,000 to 15,000 years ago.

The name of this premier site for studying the Stone Age has been taken to label the theory that industrial civilization will soon collapse and send humankind into precipitous decline.

Olduvai Gorge is best known as the site where, in 1959, the discoveries of Mary and Louis Leakey changed paleontology to focus on Africa, rather than Asia, as the region of human origins.

The Oxford Dictionary of Scientists (Oxford University Press, 1999) states: "Leakey's work has not only provided evidence for the greater age of humans but suggests that Africa, and not as was previously thought, Asia, may have been the original center of human evolution."

Social change, he concluded, involves a change in the techniques whereby people live.

> *We shall define as a "social steady state" any society in which the quantity [of energy expended] per capita ... shows no appreciable change as a function of time. ... On the other hand a society wherein ... the average quantity of energy expended per capita undergoes appreciable change as a function of time is said to exhibit "social change." ... Upon this basis we can measure quantitatively the physical status of any given social system. ... The energy per capita [equals the] the total amount [of energy] expended divided by the population.* (Ackerman, 1932, p. 18-19)

Ackerman's Law is expressed by the ratio: e = Energy/Population.

It is important to acknowledge that in 1943 anthropologist Leslie A. White independently discovered what is now properly designated Ackerman's Law.[2]

M. KING HUBBERT, Geophysicist (1903-1989): In 1949 King Hubbert noted that world energy consumption per capita, e, after historically rising very gradually from about 2,000 to 10,000 kilogram calories per day, then increased to a much higher level in the 19th century. Further, he believed it possible for global society to maintain a high level of e indefinitely (later he labeled this "Course I"). But he also realized that society could permanently collapse back to "the agrarian level of existence" (later he labeled this "Course III").

Hubbert published sketches of Course III (overshoot and collapse) many times after 1949. And, although he kept the general shape of the curves the same, he successively decreased his estimate of when the peak of e would occur. Namely: In his original paper he put the peak of e in 2400 C.E. (Hubbert, 1949); in his next version he put the peak in 2360 C.E. (Hubbert, 1962); and in his final version he put the peak in 2150 C.E. (Hubbert, 1976). Thus between 1949 and 1976 Hubbert's "most dismal Course III" became successively bleaker by some 250 years.

The historical data through 2003 (shown later as curve 2, Figure 2) now rules out Hubbert's most optimistic Course I. This leaves global society with only two feasible futures: Course II (an orderly decline of e to a medium steady state) and Course III (collapse to the agrarian level of existence).

Linking the "scouts" together: Henry Adams in about 1915 gave the copyright to his book *Mont-San-Michele and Chartres* to the American Institute of Architects whereon they published it. At that time Frederick Ackerman was a distinguished member of the Institute. Further, both Frederick Ackerman and King Hubbert were close friends and prominent members of Technocracy Inc. Thus the intellectual chain linking Adams to Ackerman to Hubbert is complete.

Electromagnetic Civilization

> *For systems theorists the first message of their eerily smooth distribution curves is clear: big blackouts are a natural product of the power grid. The culprits that get blamed for each blackout – lax tree trimming, operators who make bad decisions – are actors in a bigger drama, their failings mere triggers for disasters that in some strange ways are predestined. In this systems-level view, massive blackouts are just as inevitable as the mega quake that will one day level much of Tokyo.* (Fairley, 2004)

This section stresses that 1) affordable electric power is crucial for modern living (all agree); 2) big blackouts are inevitable (power system engineers agree); 3) permanent blackouts are coming ("unthinkable").

1) King Kilowatt

Electricity is the most versatile and convenient end-use energy ever put to use by humanity. But one catch is that electricity is "everywhere and nowhere." Think of all the energized switches, outlets, and wires in an "empty" room plus the electromagnetic waves that pervade it at the speed of light (AM, FM, TV, cell phone, etc.). Then there is the vastly greater expanse of man-made electromagnetic energy that envelops the planet and radiates out into the Galaxy.[3]

Every power plant generates electromagnetic waves. From there they follow countless miles of high-voltage wave guides (commonly called "wires" or "lines") at near the speed of light to numerous customer loads: heaters, motors, telephones, lights, antennas, radios, televisions, fiber-optic systems, the

Internet, etc. We constantly "swim" through this sea of electromagnetic energy just as fishes swim through water. And, like water to fishes, this ethereal energy is vital to modern civilization.

By tallying the amount of primary energy used to generate electric power we find that electricity wins hands down as our most important end-use energy. To wit: I estimate that 7% of the world's oil is consumed by the electric power sector, 20% of the world's natural gas, 88% of the coal, and 100% each for nuclear and hydroelectric power. The result is that electric power accounts for 43% of the world's end-use energy compared to oil's 35%.

The critical role that electricity plays in the United States is likewise telling. Out of the total end-use energy consumed in each of the social sectors in 2003:

1) 0.2% was electricity in the Transportation sector,
2) 33.3% in the Industrial sector,
3) 65.9% in the Residential sector, and
4) 76.2% in the Commercial sector (EIA, 2004).

2) Big Blackouts Are Inevitable

The second catch is that electricity is generated, transmitted, and distributed by a complex, far-flung, costly, and fragile infrastructure.

The electric power networks are the largest, most complex machines ever constructed. They have been built, rebuilt, and interconnected over many decades with a baffling variety of hardware, software, standards, and regulations. The ravenous input nodes must be continuously fed with immense amounts of primary energy and then the output nodes deliver electromagnetic energy to myriad customer loads.

Between the input and output nodes are power plants, substations, and transmission and distribution lines and towers.

Inevitably the old equipment wears out or becomes obsolete so highly educated and skilled personnel are needed to maintain the grids.

Then there are power control centers that monitor and manage the generation, transmission, and distribution of electric power over local, regional, and super-regional areas. Each control center has numerous computers, databases, and special software to monitor and control the flow of power. Thoroughly trained and dedicated operators are essential to keep the grids going 24/7/365.

Much faster response times are provided by "protective relays" that instantly trip for abnormal conditions, such as short circuits on high-voltage power lines.

Thus, except for lightning strikes and tornadoes, it might seem that the power networks would always operate reliably, thus completely avoiding big blackouts.

But that is false. Power control specialists J. Apt and L. B. Lave (2004) have warned:

> *Data for the last four decades show that blackouts occur more frequently than theory predicts, and they suggest that it will become increasing expensive to prevent these low-probability, high-consequence events. The various proposed "fixes" are expensive and could even be counterproductive, causing future failures because of some unanticipated interaction.*

3) Permanent Blackouts Are Coming

The third catch, according to the Olduvai Theory, is that sooner or later the power grids will go down and never come back up.[4] The reasons are many.

The International Energy Agency (IEA, 2004) estimates that the cumulative worldwide energy investment funds required from 2003 to 2030 would be about $15.32 trillion (T, US 2000 $) allocated as follows:

1. Coal: $0.29T (1.9% of the total),
2. Oil: $2.69T (17.6%),
3. Gas: $2.69T (17.6%),
4. Electricity: $9.66T (63.1%).

Thus the IEA projects that the worldwide investment funds essential for electricity will be 3.7 times the amount needed for oil alone, and much greater than all of that required for oil, gas, and coal combined.

The OT says that the already debt-ridden nations, cities, and corporations will not be able to raise the $15.32 trillion in investment funds required by 2030 for world energy. (Not to mention the vastly greater investment funds required for agriculture, roads, streets, schools, railroads, water resources, sewer systems, and so forth.)

Furthermore, because of the rapidly rising cost of

electricity, the increasingly impoverished customers won't be able to pay their electric bills. Worse yet, the really desperate ones will illegally wire directly to the low-voltage power lines, so without a wattmeter to record their usage they won't even have any bills to pay.

We will return to this pivotal topic later, but first I will use the most recent data now available to test OT Postulates 1 and 2.

World Energy and Population: the Basis

During the last two centuries we have known nothing but exponential growth and in parallel we have evolved what amounts to an exponential-growth culture, a culture so heavily dependent upon the continuance of exponential growth for its stability that it is incapable of reckoning with problems of no growth. (M. King Hubbert, 1976, p. 84)

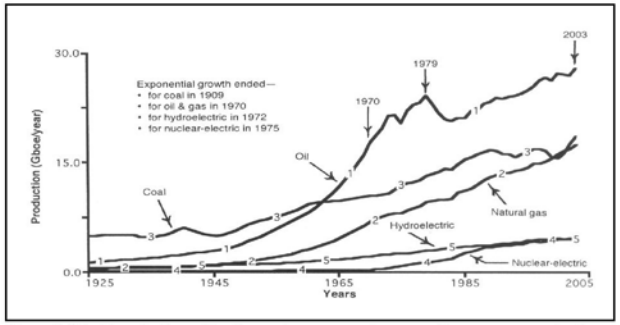

Figure 1. World production of the five major sources of energy. All curves are scaled in 'billion barrels of oil equivalent' (Gboe). Data sources: Romer (1985) for 1850-1964; British Petroleum (2004) for 1965-2003.

The Olduvai Theory is based on time-series data of world energy production and population; all data are freely available on the Internet. The data are arrays of discrete numbers year-on-year, not continuous functions of time. Hence the difference calculus must be used, not the infinitesimal calculus. Postulates 1 and 2 require that we distinguish intervals of linear growth from those of exponential growth.[5, 6]

Five Major Sources of Energy

Our energy database for testing the OT ranges from 1850 through 2003 (Romer, 1985; British Petroleum, 2004). However it is more effective to focus on the years from 1925 through 2003 for world oil, natural gas, coal, nuclear, and hydroelectric energy production – Figure 1.[7]

Commercial oil production was underway before 1833 in the Chechen Republic (using shovel-dug wells; Iastratov, 2004). Hence, if we assume that it began in 1833 and grew exponentially up to 1850, then world oil production grew exponentially at an average of 8.8%/y during the 137-year interval from 1833 to 1970. After that production slowed to various linear rates of growth and decline from 1970 to 2003 (curve 1).

World natural gas production began in about 1880 and grew exponentially at 6.8%/y during the 90-year interval from 1880 to 1970. Thereafter it grew at a 2.7%/y linear rate from 1970 to 2003 (curve 2).

Coal was burned for cooking and space heating ever since the 12th Century, but it was not used for mechanical work until about 1700 (Savery's steam engine). Thus if we assume that it began in 1700 and grew exponentially up to 1850, then coal production grew exponentially at about 4.3%/y during the 209-year interval from 1700 to 1909. This was followed by several intervals of linear growth and decline from 1909 to 2003 (curve 3).

Nuclear-electric energy production began in 1955 (in Britain) and grew exponentially at 29.7%/y from 1955 to 1975. This was succeeded by three intervals of linear growth and decline from 1975 to 2003 (curve 4).

Hydroelectric energy production began in about 1890 (at Niagara Falls, USA) and grew exponentially at 15.4%/y from 1890 to 1912, followed by exponential growth at 3.6%/y from 1912 to 1972. Next came linear growth from 1972 to 2000 and decline from 2000 to 2003 (curve 5).

Testing Postulate 1 is facilitated by ranking the five sources of energy production by the duration of their intervals of exponential growth:

1. Coal grew exponentially for 209 years: 1700-1909.

2. Oil grew exponentially for 137 years: 1833-1970.

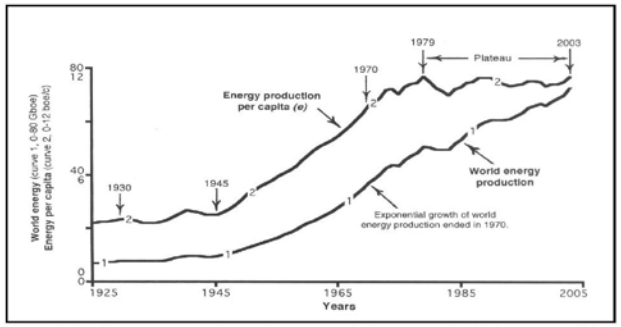

Figure 2. World energy production and energy production per capita. Data sources: 1) for energy – Romer (1985) for 1850-1964 and British Petroleum (2004) for 1965-2003; 2) for population – UN (2004) for 1850-1949 and USCB (2004) for 1950-2003.

3. Natural gas grew exponentially for 90 years: 1880-1970.

4. Hydroelectric energy grew exponentially for 82 years: 1890-1972.

5. Nuclear-electric energy grew exponentially for 20 years: 1955-1975.

Note well that none of the five sources of primary energy production grew exponentially after 1975. *Postulate 1 is partly verified (continued below).*

Q: So is exponential growth passé on this planet? My response: There is, I recognize, the possibility that world coal and/or nuclear-electric energy production could grow exponentially for very brief periods in the future, but that option does not exist for oil, natural gas, or hydroelectric energy production.

World Total Energy Production and Energy Production per Capita

By combining world oil, natural gas, coal, nuclear, and hydroelectric energy production (discussed above), we get the world total energy production. The portion from 1925 through 2003 is shown by curve 1, Figure 2.

World total energy production grew exponentially at about 4.6%/y from 1700 to 1909. Next it grew linearly at 2.2%/y from 1909 to 1930 and 1.5%/y from 1930 to 1945. Subsequently it surged exponentially at 5.5%/y from 1945 to 1970. This was followed by linear growth at 3.5%/y from 1970 to 1979. Thereafter world total energy production slowed to linear growth of about 1.5%/y from 1979 to 2003. *Postulate 1 is verified.*

World population is the essential other half of the energy-population matrix, but it is omitted from Figure 2 to avoid clutter. Described in numbers: World population grew linearly at an average of 0.5%/y from 1850 to 1909; 0.8%/y from 1909 to 1930; 1.0%/y from 1930 to 1945; 1.7%/y from 1945 to 1970; 1.8%/y from 1970 to 1979; and 1.5%/y from 1979 to 2003 (UN, 2004; USCB, 2004).

Comparing the foregoing numbers: World total energy production easily outpaced world population growth from 1700 to 1979, but then from 1979 through 2003 total energy production and population growth went dead even at 1.5%/y each.

World total energy production per capita, *e,* grew exponentially at 3.9%/y from 1700 to 1909. Thereafter it grew at linear rates of 1.4%/y from 1909 to 1930; 0.5%/y from 1930 to 1945; 3.7%/y from 1945 to 1970; 1.7%/y from 1970 to 1979; and 0.0%/y (i.e., zero net growth, called the 'Plateau') from 1979 to 2003 – curve 2, Figure 2.

Observe in Figure 2 that average *e* did not grow at all from 1979 to 2003. *Postulate 2 is confirmed from 1979 to 2003.*

The Olduvai Theory

Many industrialized nations are now growing rapidly and placing ever-greater demands on world resources. Many of those resources come from the presently underdeveloped countries. What will happen when the resource-supplying countries begin to withhold resources because they foresee the day when their own demand will require the available supplies? Will the developed nations stand by and let their economies decline while resources still exist in other parts of the world? Will a new era of international conflict grow out of pressures from resource shortage? (Forrester, 1971, p. 70)

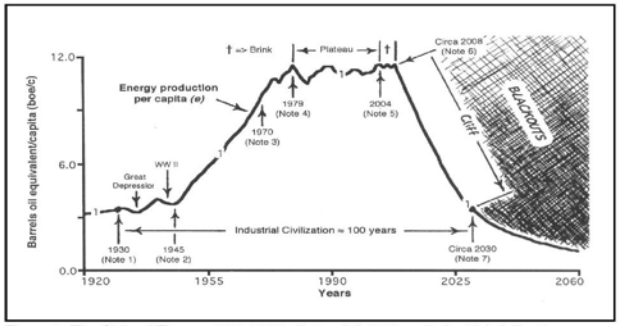

Figure 3. The Olduvai Theory: 1930-2030. Notes: (1) 1930 => Industrial civilization begins; (2) 1945 => Very strong growth begins; (3) 1970 => Growth begins to slow; (4) 1979 => The no-growth "Plateau" begins; (5) 2004 => The "Brink" begins; (6) Circa 2008 => The "Cliff" begins; and (7) Circa 2030 => Industrial civilization ends. Data sources: 1) for energy – Romer (1985) for 1850-1964, British Petroleum (2004) for 1965-2003, and Duncan (this paper) for 2004-2060; 2) for population—UN (2004) for 1850-1949, USCB (2004) for 1950-2004, and Duncan (this paper) for 2005-2060.

The Olduvai Theory states that the life expectancy of industrial civilization is approximately 100 years: circa 1930-2030. Ackerman's ("White's") Law defines it: e = *Energy/Population*. The duration of industrial civilization is measured by the time in years from when e reaches 30% of its maximum value to the time when e falls back to that value. The OT is illustrated in Figure 3.

Seven events: The 1st event in 1930 (Note 1, Figure 3) marks the beginning of industrial civilization where e first reached 30% of its maximum value. The 2nd event in 1945 (Note 2) marks the beginning of very fast growth. The 3rd event in 1970 (Note 3) marks the beginning of slower growth. The 4th event in 1979 (Note 4) marks the start of a rough *Plateau* of no growth. The 5th event in 2004 (Note 5) marks the beginning of the *Brink*. The 6th event circa 2008 (2006-2012, Note 6) marks the edge of the *Cliff* where e begins a precipitous decline. The 7th event circa 2030 (Note 7) is the "lagging 30% point" when e falls back to 30% of its maximum value. This puts the duration of industrial civilization at approximately 100 years.

Seven intervals: 1) From 1930 to 1945 e shows irregular growth during the Great Depression and World War II.[8] 2) The strong growth from 1945 to 1970 correlates with the strong growth in world oil and natural gas production. 3) The slowing growth of e from 1970 to 1979 reflects slackening oil production. 4) The rugged *Plateau* from 1979 to 2003 shows that energy production ran neck-in-neck with population growth. 5) The *Brink* from 2004 to circa 2008 represents the energy industry's struggle to keep up with rising demand. 6) The *Olduvai Cliff* from circa 2008 to 2030 correlates with a spreading epidemic of permanent blackouts. 7) From 2030 onward society approaches the agrarian level of existence.

The most reliable leading indicator of the OT Cliff event, if and when it happens, will be brownouts and rolling blackouts.

World Population Scenarios

The resource wars will run their courses, and populations will crash. The journey back to 'natural' levels of world population will not be a joyous one. Have policy-makers begun to grasp the scale of the problem that confronts

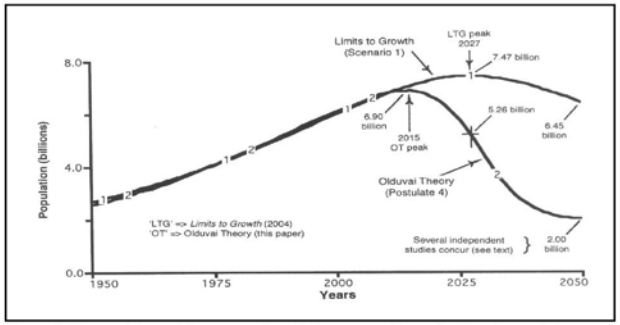

Figure 4. Two world population scenarios. Data sources: Curve 1—Meadows et al. (2004); Curve 2 – USCB (2004) for 1950-2004, and Duncan (this paper) for 2005-2050.

them? Are they still dazzled by the contention that rates of increase are slowing, not grasping that all the time the numbers are mounting up? (Stanton, 2003)

Two scenarios of world population are illustrated in Figure 4.[9] The first is based on a system dynamics model that was recently updated and tested with many alternative policies.[10] The second is based on some of my previous studies including nine forecasts of world oil production. Details follow.

1. Limits to Growth: The 30-Year Update (2004)

In 1970 The Club of Rome sponsored Phase One of the "Project on the Predicament of Mankind." Dr. Dennis Meadows of MIT directed a team of 17 scholars that worked for two years to complete it. "The study examined the five basic factors that determine, and therefore, ultimately limit, growth on this planet – population, agricultural production, natural resources, industrial production, and pollution."

Phase One of the study was published in *The Limits to Growth* (Meadows et al., 1972). That study was updated and published in *Beyond the Limits* (Meadows et al., 1992). In turn, the 1992 study was updated in 2002 and published in *Limits to Growth: The 30-Year Update* (Meadows et al., 2004).

The 30-year update is coded in 241 system dynamics equations. The main output of the model depicts 10 scenarios, and the key variables for each are plotted out over time. Depending on the assumptions, the LTG model can produce many different scenarios ranging from the deep impoverishment of society to a high level of human welfare extending far into the future.

Meadows et al. (2004) describe their reference scenario:

> *The world society proceeds in a traditional manner without any major deviation from the policies pursued during most of the twentieth century. Population and production increase until growth is halted by increasingly inaccessible nonrenewable resources. Ever more investment is required to maintain resource flows. Finally, lack of investment funds in the other sectors of the economy leads to declining output of both industrial goods and services. As they fall, food and health services are reduced, decreasing life expectancy and raising average death rates.* (p. 168-69; emphasis added)

The peak of world population in the LTG scenario occurs in 2027 at 7.47 billion people – curve 1, Figure 4. Note well that the "lack of investment funds" is cited as one of the primary causes of collapse.

Bottom line: The tone of *Limits to Growth: The 30-Year Update* is cautiously optimistic. The authors maintained in 2002 that there was still time for the world to achieve sustainability, but the course of society would have to be quickly changed. However by 2022 it will be too late. The 20-year delay in moving toward sustainability sends the world "on a turbulent, and ultimately unsuccessful path. Policies that were once adequate are no longer sufficient."

2. The Olduvai Theory and World Population

> *[As a result of permanent blackouts of electric power] the industries of all civilized countries would stop working, so that, with millions unemployed and with a total cut in the production of goods,*

> *unprecedented and incurable misery would occur, killing perhaps three-quarters of the population, and leaving the rest in a deplorable state.* (Thirring, 1956, p. 135)

The data for testing OT Postulate 3 are not available at this writing. For the sake of discussion, however, I reserve Postulate 3 for later, and show that Postulate 4 (the Olduvai scenario for world population) is consistent with a growing number of autonomous studies.

The peak of world population in the OT scenario occurs in 2015 at 6.90 billion – curve 2, Figure 4. Notice that the OT scenario closely matches the LTG scenario up to 2012. Thereafter, however, the OT scenario diverges downward. Thus when the LTG scenario peaks in 2027 at 7.47 billion, the population in the Olduvai scenario has declined to 5.26 billion – the same value it had in 1990.

The differences increase over time. Namely: When the LTG scenario shows the world population at 6.45 billion in 2050, population in the OT scenario has fallen to 2.00 billion – the same value it had in 1925.

The differences between the LTG scenario and the OT scenario, I reason, occur mainly because the *Limits to Growth* model does not explicitly include world energy production, whereas the Olduvai Theory does (Duncan, 1989, 1993, 1996, 2000, 2001, 2003, 2004; Duncan & Youngquist, 1999).

Moreover, the Olduvai Theory specifies that permanent blackouts – each happening one-by-one, region-by-region, and spreading worldwide over time – will be the *proximate (direct, immediate)* cause of the collapse of industrial civilization. In contrast, the *Limits to Growth* model identifies many *ultimate (indirect, delayed)* causes of the collapse – especially the "lack of investment funds for industrial goods and services." Hence the LTG and OT scenarios are consistent and complementary.

The Olduvai scenario was neither first nor is it unique in projecting that world population could quickly decline to its pre-industrial level. Five examples follow.

In 1949 King Hubbert realized that the human population could collapse back to "the agrarian level of existence" ("Scenario III", discussed previously).

Austrian physicist Hans Thirring (1956) was, as far as I can tell, the first to recognize that the rapidly growing world population was increasingly vulnerable to the loss of electric power. His scenario (quoted above) suggests that permanent blackouts might kill "perhaps three-quarters of the [world's] population." Thus the widespread loss of electric power might cause the OT peak population of 6.90 billion in 2015 to fall to 1.73 billion in 2050.

According to Professor David Pimentel of Cornell University the world will have to adjust to lesser supplies of energy and food by a commensurate decrease in population. D. Pimentel and M. Pimentel (1996) state, "…the nations of the world must develop a plan to reduce the global population from near 6 billion to about 2 billion. If humans do not control their numbers, nature will."

Professor Richard Heinberg of the New College of California anticipates that oil and gas depletion will send prices of these fuels – along with the hydrocarbon-dependent fertilizers, pesticides, and herbicides – soaring. Hence without cheap energy, industrial agriculture will be able to feed only a fraction of the people it does now – perhaps less than two billion, roughly its pre-industrial level (reported by J. Attarian, 2003).

After reviewing an early draft of this paper, geologist Walter Youngquist (2004) wrote, "I doubt if population will be reduced to 2 billion or less by 2030 – you might want to modify that as the Third World will still have a lot living on a subsistence basis. I would move the 2 billion or so ultimate figure to year 2050 perhaps. By the way, the 2 billion is what others say is probably the limit in terms of a renewable natural resource economy – and the living is not likely to be as high as it is now."

To extend our survey, four widely circulated scenarios to 2050 tend to put the world population far above those mentioned above. Specifically, the US Census Bureau puts the world population in 2050 at 9.2 billion (USCB, 2004). In addition, the United Nations offers three population scenarios for 2050:10.6 billion [high], 8.9 billion [medium], and 7.4 [low] (UN, 2004).

All population scenarios – we point up – are speculation. Only time will tell.

History gives no precedent for the collapse of industrial (electromagnetic) civilization, but the consequences of the policy of exponential brinkmanship are clear (White, 1943; Thirring, 1956;

Youngquist, 1997, 1999; Stanton, 2003; and Bartlett et al., 2004).

The overshoot and collapse of industrial civilization was assured once humanity became dependent on the rapid exploitation of nonrenewable resources on a finite planet. Moreover our insatiable appetite for electric power has accelerated the collapse and steepened the decline (Adams, 1907; Duncan, 2000, 2001).

The Olduvai Theory is extensively discussed on the worldwide web – pro, con, and more. Search for "olduvai theory" to access the various sites and forums.

Conclusions

The Olduvai Theory states that the life expectancy of industrial civilization is approximately 100 years: circa 1930-2030. Ackerman's ("White's") Law defines it: $e = Energy/Population$. Four postulates follow:

1. The exponential growth of world energy production ended in 1970.

2. Average *e* will show no growth from 1979 to circa 2008.

3. The rate of change of *e* will go steeply negative circa 2008.

4. World population will decline proximate with *e*.

Henry Adams in 1893 envisioned that electric power would accelerate society into chaos and ruin. Frederick Ackerman in 1932 showed that social change could be quantified by *e*. King Hubbert graphed the shape of the *e* curve in 1949. Thus an Olduvai scenario existed before 1950.

None of the world's five major sources of primary energy has grown exponentially since 1975 (Figure 1). World total energy production has not grown exponentially since 1970 (curve 1, Figure 2). *Postulate 1 is verified.*

The average rate of growth of world energy production per capita *(e)* was zero from 1979 to 2003 (curve 2, Figure 2). *Postulate 2 is confirmed through 2003.*

Seventy-four (74) out of the approximately 100 years of the Olduvai Theory are now history (Figure 3). All of the data needed to test it are freely available on the worldwide web and updated annually. Rigorous tests are welcome.

The Olduvai scenario for world population peaks at 6.9 billion circa 2015 (curve 2, Figure 4). Thereafter the population declines to 2.0 billion in 2050 (Postulate 4). A growing number of independent studies concur (see text). ■

ACKNOWLEDGMENTS

Walter Youngquist has bestowed wise guidance and much scientific information over many years. Robert Hickerson, Alistair McCrone, John Attarian, David Pimentel, Virginia Abernethy, and David Burghardt have helped out in many ways. Colin Campbell, Ali Samsam Bakhtiari, Alan Hammaker, and Francis de Winter have provided valuable perspectives on diverse subjects. Richard Pelto's "Third Place Academy" has extended my horizons. Marvin Gregory has passed along a constant stream of useful information. Patrick McNally's keen questions have been very helpful. Ronald Angel has stressed computational rigor. John Greer has fostered localized rural communities. The web sites of Jay Hanson, Ronald Swenson, and Tom Robertson have bought forth many useful discussions and suggestions from around the world.

ENDNOTES

1. Hydrocarbons, of course, are the crucial source of primary energy for industrial civilization – as it now exists. However *if* we had abundant and affordable electric power from other sources, *then* civilization – in some form and at some population level – could continue indefinitely sans hydrocarbons.

2. "We have, in the above generalizations *the* law of cultural evolution: *Culture develops when the amount of energy harnessed by man per capita per year is increased; or the efficiency of the technological means of putting this energy to work is increased; or, as both factors are simultaneously increased*" (White, 1943). But as far as I know no one has ever quantified how world total energy efficiency has changed over time.

3. Engineers usually represent electromagnetic energy as waves. Physicists often represent it as particles. A coherent theory is lacking.

4. The OT says that permanent blackouts will be the instantaneous (direct) cause of collapse of industrial civilization. In contrast, the deeper causality will be a complex matrix of delayed feedback interactions, including: depletion of nonrenewable resources, lack of capital and operational investment funds, soil erosion, declining industrial and agricultural production, Peak Oil, global warming, pollution, deforestation, falling aquifers, unemployment, resource wars, and pandemic diseases – to name just a few.

5. For exponential growth the year-on-year incremental changes must be positive and exponential; for exponential decline they must be negative and exponential.

6. The exponential doubling time ('DT' in years) is approximately equal to *69.3/PctG* where *'PctG'* is the average percent growth per year (Bartlett et al., 2004, p. 396).

7. One boe = 5.46 million Btu (heat value).

8. Worthy of note in Figure 3 is how clearly the plot of Ackerman's Law *(e)* reveals the Great Depression and World War II.

9. By definition, all scenario curves, dates, and scales are approximate.

10. System dynamics is a methodology for studying, testing, and managing complex, nonlinear, feedback systems, such as one finds in business and other social systems. See: www.albany.edu/cpr/sds.

DEFINITIONS

"Scenario" means an outline for any series of events – real, imagined, or tutorial. "Circa" indicates an approximate year. "Oil" means crude oil and natural gas liquids. "Total energy" means the world's five major sources of commercial energy combined: oil, natural gas, coal, hydroelectricity, and nuclear-electricity. "*e*" means energy production per capita. Energy "production" and "consumption" mean the same thing. (Although energy is neither produced nor consumed, these terms are common in the industry.) "%/y" means percent per year. "b" means barrels of oil. "boe" means barrels of oil equivalent. "G" means billion (10^9). "T" means trillion (10^{12}). "Industrial civilization," "electromagnetic civilization," and "modern civilization" all mean the same thing. "C.E." means Common Era; "B.C.E." means Before Common Era. "Brinkmanship" means the policy of pursuing a hazardous course to the brink of catastrophe.

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CONGRESS OF THE UNITED STATES

For Immediate Release: Contact: (Bartlett) Lisa Wright at 202-225-2721

March 29, 2007 (T. Udall) Marissa Padilla 202-225-6190

New GAO Peak Oil Report Provides Urgent Call to Action: U.S. Vulnerable and the Government Unprepared for Unacceptably High Risks of Oil Supply Shock

Washington, DC - Congressmen Roscoe Bartlett (R-MD) and Tom Udall (D-NM), co-chairmen of the Congressional Peak Oil Caucus, held a Capitol Hill news conference with Mark E. Gaffigan of the U.S. Government Accountability Office (GAO) on Thursday, March 29, 2007 to discuss the release of an embargoed GAO report that revealed the United States is *particularly vulnerable* and the United States federal government is *unprepared* to respond to severe consequences from increasing and unacceptable risks of significant disruptions to oil supplies from peak oil and other above ground political and economic factors. "CRUDE OIL - Uncertainty about Future Oil Supply Makes It Important to Develop a Strategy for Addressing a Peak and Decline in Oil Production," (GAO-07-283) is now available for downloading from the GAO website: www.gao.gov.

The report reaffirmed that peak oil is inevitable. It is the point of maximum oil production followed by irreversible declines for oil fields, regions, countries and eventually the world. The report found most experts project a peak and subsequent decline in world oil production could occur ***without warning*** any time between now and 2040. The quality and availability of data concerning oil reserves and production capabilities makes projections uncertain. In addition, significant above ground political and economic risks to increasing world production are detailed affecting a large majority of world reserves. Coupled with rising demand, these factors show increasing risks of significant disruption to oil supplies. The report found no focus, coordination or plans by the federal government to prepare for peak oil or other potential supply disruptions.

Congressman Roscoe Bartlett said, "This GAO peak oil report is a clarion call for leadership at the highest level of our country to avert an energy crisis unlike any the world has ever before experienced and one that we know could happen at any time. Only the President can rally the country to take the urgent steps necessary. Potential alternatives to oil are extremely limited. Technology won't save us without time and money to develop and scale them up."

Congressman Tom Udall said, "Today's report once again emphasizes our need to prepare for peak oil by implementing forward-thinking approaches and advance initiatives that will move our nation toward greater energy stability and independence. Practical legislation coupled with a concerted focus on conservation, higher fuel efficiency standards, energy saving buildings and appliances, revival of passenger and freight rail, expanded research into and use of biofuels will make the difference. I wholeheartedly believe in the ingenuity and intelligence of our countrymen and women to achieve these ambitious goals."

Projecting future oil supplies is highly uncertain, in part, because the Organization of Petroleum Exporting Countries (OPEC) controls most of the estimated world oil reserves, but its estimates of reserves are not verified by independent auditors. In addition, four countries—Iran, Iraq, Nigeria, and Venezuela hold one-third of proven oil reserves and are considered at high risk for political disruption.. Countries with medium or high levels of political risk contained 63 percent of proven worldwide oil reserves. According to GAO's analysis, "85 percent of the world's proven oil reserves are in countries with medium-to-high investment risk or where foreign investment is prohibited."

"A number of studies [GAO] reviewed indicate that most of the U.S. recessions in the post-World War II era were preceded by oil supply shocks and the associated sudden rise in oil prices. Ultimately, however, the consequences of a peak and permanent decline in oil production could be even more prolonged and severe than those of past oil supply shocks. Because the decline would be neither temporary nor reversible, the effects would continue until alternative transportation technologies to displace oil became available in sufficient quantities at comparable costs."

The United States and the transportation sector are identified as particularly vulnerable to disruptions and dislocations from peak oil. "In the United States, alternative transportation technologies have limited potential to mitigate the consequences of a peak and decline in oil production, at least in the near term, because they face many challenges that will take time and effort to overcome… Development and widespread adoption of the seven alternative fuels and advanced vehicle technologies [GAO] examined will take time, and significant challenges will have to be overcome, according to DOE."

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From: Speelman, Harry [mailto:SpeelmH@wsdot.wa.gov]
Sent: Thursday, September 15, 2011 11:46 AM
To: Columbia River Crossing
Subject: FEIS email notification

P-091-001 Why do you not drop the light rail component of the project?

HARRY SPEELMAN,CPPB
SW REGION PURCHASING MANAGER
PHONE: (360)905-2286
FAX: (360)905-2292
E-MAIL: SPEELMH@WSDOT.WA.GOV

P-091-001

Light rail is an integral part of the CRC project. Light rail has been endorsed by every local Sponsoring Agency (Vancouver City Council, C-TRAN, RTC, Portland City Council, TriMet, and Metro), whose boards include elected leadership from throughout the area.

Annual light rail passenger trips crossing the I-5 bridge in 2030 are projected to be 6.1 million, with daily ridership around 18,700. The travel time for the morning commute by light rail between downtown Vancouver and Pioneer Square in downtown Portland will be approximately 34 minutes. Light rail would travel on a dedicated right-of-way, with more reliable travel times than auto drivers dealing with unpredictable road conditions, traffic congestion, and parking challenges.

The CRC project planning for light rail incorporates and supports the principles of Vancouver's City Center Vision Plan. Downtown Vancouver has seen recent growth in higher density mixed use projects from three to 12 stories in height. In addition, another 4,000 downtown condominiums are proposed or pending as part of new developments. The core of Vancouver has, along with many of the larger corridors such as Fourth Plain Blvd, medium to high density residential development and an urban mix of uses. Transit demand in these areas is quite high, and ridership will increase with the introduction of light rail.

Hines, Maurice

From: stevescare@aol.com
Sent: Friday, October 21, 2011 7:10 AM
To: Columbia River Crossing
Subject: voting abolished

P-092-001

There is absolutely no way this project should move forward without voter approval.

The level of controversy and potential scandal involded make it mandatory.

Worst yet is the obvious public opposition to light rail being extended to Vancouver.
Made more obvious by the deliberate prohibition of voting by public officials who know the outcome.

With the economy in total flux and all things in a new economy of desperation we cannot afford to allow officials to act as nothing is new.

P-092-001

There will not be a public vote on construction of the various CRC project elements. However, as a public project, it must be approved and funded by the decisions of elected officials who are themselves directly elected by voters. Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on pursuing a public vote.

Hines, Maurice

From: rswaren2002@comcast.net
Sent: Monday, October 24, 2011 3:35 PM
To: Columbia River Crossing
Subject: CRC project

P-093-001 I don't think the CRC project is, at all, appropriate, for our region for the following reasons

1. The claim for 25-30,000 jobs is wildly inflated having worked in heavy construction for most of my career I would wager that a lot of jobs will go to out of state contractors and to their regular workforces which are looking for new jobs. Furthermore, even in the spinoff there would not be anything close to 25,000 and those would be TEMPORARY.

P-093-002 2. The CRC project, by removing businesses presently in its path will TAKE AWAY several hundred PERMANENT FULL TIME JOBS.

P-093-003 3. The long term financing for this project is very unclear. What impact will tolling have on the local economy? What will tolls actually cost before the project is paid off! Will local government intend to use future tolls for other projects?

P-093-004 4. When all is said and done, we still only have two access routes across the Columbia. Meanwhile we are in the middle of a growing transportation corridor, the Interstate 5 system. Other cities and states rely on the I-5 for their own economy and people and goods must move through here on their way elsewhere.. Trying to limit Columbia crossings to only two is economically RISKY. The only similar analogy is in Memphis TN which has two crossings of the Mississippi River, yet a suburb only one tenth the size of Clark Co. Washington.

OVERALL, THE CRC IS A VERY BAD PLAN.

Ron Swaren

P-093-001

The job estimations were developed using standard methodologies, which were reviewed by staff in all sponsoring agencies.

P-093-002

The LPA will displace businesses, as addressed in FEIS Section 3.3 Property Acquisitions and Displacement, and in the Property Acquisitions and Displacement Technical Report. These displacements will affect businesses with employees, as addressed in FEIS Section 3.4 Land Use and Economics, and in the Economics Technical Report. However, the displacement of businesses and jobs will be offset to some degree by the project creating or sustaining jobs over the life of the project.

P-093-003

The issue of economic impacts was addressed as part of the economics analysis and is described in detail in the Economics Technical Report. This report, and Chapter 3 (Section 3.4) of the FEIS, note that the increased costs incurred because of tolls would generally be offset by the improved travel options and travel times. Under existing and No Build Alternative conditions, congestion delays and high crash rates have significant costs for local businesses and travelers; improving these conditions is one of the purposes of the project.

Tolls could discourage home-based shopping trips from Clark County to points in northern Oregon, such as Hayden Island and Airport Way. However, the variable-rate toll structure that was evaluated in the DEIS allows for different rates to be charged by time of day. Therefore, discretionary trips, such as those between Oregon and Washington for retail purposes, could be taken in off-peak hours when toll rates are at their lowest, reducing the effect of the tolls on these types of trips. Also, CRC would provide improved transit connections between Clark County and Oregon, offering travelers a toll-free alternative for reaching destinations across the river.

Tolling I-205 or any other facility is not part of this project, but could be implemented separately. With few exceptions, federal statutes do not permit tolling of an existing interstate highway without associated improvements. FHWA does have pilot programs that allow state departments of transportation to apply for approval to toll a facility. Local and State governments are struggling to fund needed infrastructure improvements and maintenance. Tolls, user fees, and other systems that require "users" to pay additional costs are likely to become increasingly common.

P-093-004

While a third crossing would provide some benefits, and several new crossing options were considered in the CRC alternatives analysis and screening, none of them would adequately address the fundamental needs that have been identified for this project, as discussed in Chapter 2 of the FEIS.

Hines, Maurice

From: Michael Szporluk [mszporluk@yahoo.com]
Sent: Monday, October 24, 2011 6:32 PM
To: Columbia River Crossing
Subject: CRC feedback

To whom it may concern,

P-094-001 I understand that residents have until midnight tonight to provide feedback on the CRC as part of the EIS process.

I am an Portland Oregon resident who strongly opposes the CRC construction project as outlined by the project team.

There are environmental and financial reasons for my opposition.

First, even if constructed, it would not resolve the problem it is intended to resolve. it will encourage more use of the freeway, thereby shifting congestion into the rose quarter.

P-094-002 Second, by encouraging more use of the freeway, we will raise emissions, rendering it more difficult if not impossible to meet our climate goals.

P-094-003 Third, the financing isn't in place to complete the project, and given the state of the economy, it is unlikely that the Feds will have the funds the states of Oregon and Washington are relying on.

P-094-004 Fourth, there are significantly cheaper and better alternatives that have not been explored sufficiently.

I'm a registered voter and tax payer -- and do not want to see my money to go to such a project. Its time to put the CRC project to rest. If you go forward with the project, you're only setting the residents of Oregon and Washington back.

regards,

Michael Szporluk
Portland, Oregon

P-094-001

The proposed new add/drop lanes (i.e., lanes that connect two or more interchanges) are used to alleviate safety issues associated with the closely spaced interchanges in the project area and are not designed to increase capacity generally on I-5. 68% to 75% of I-5 traffic in the project area enters and/or exits I-5 within the CRC project area, and these add/drop lanes provide space for this traffic to do so without disrupting cars and trucks traveling to destinations further north and south of the project area. The project does not propose to add lanes north or south of the project limits.

The DEIS evaluation found that the project, with a toll and light rail, would actually reduce the total daily volume of traffic using the I-5 and I-205 river crossings by approximately 3%. The FEIS analysis of the project has been updated to include an evaluation of how the CRC project would affect Vehicle Miles Traveled (VMT) (see Chapter 3, Section 3.1). Rather than inducing sprawl, the CRC project will likely reinforce the region's goals of concentrating development in regional centers, reinforcing existing corridors, and promoting transit and pedestrian friendly development and development patterns. In 2010, Metro ran the MetroScope model (an integrated land use and transportation model) to forecast growth associated with transportation improvements of a 12-lane river crossing and light rail to Clark College. The model showed only minimal changes in employment location and housing demand compared to the No-Build. For more information see FEIS Chapter 3, Section 3.4.

P-094-002

Based on modeling and analysis, the CRC LPA is expected to significantly increase transit ridership and reduce the number of vehicles crossing the river. This shift toward transit, reduction in auto crossings, reduced congestion, removal of bridge lifts, and lower accident rates are all factors that contribute to lower CO_2 emissions with the project than

without it.

These factors will also make it easier for the region to meet goals for reducing greenhouse gas (GHG) emissions. Chapter 3 (Section 3.19) of the FEIS summarizes the results of GHG emissions and climate change analysis conducted for the alternatives.

P-094-003

A project almost never has the funds for construction during the decision making process and environmental analysis. It is the Record of Decision that completes the environmental phase and positions the project to receive funding for construction. Please refer to Chapter 4 of the FEIS for a description of the current plans for funding construction and operation of the LPA. This discussion provides an updated assessment of likely funding sources for this project, though it is not common practice to receive funding commitments prior to completion of the alternative selection process. As described in the FEIS, project funding is expected to come from a variety of local, state, and federal sources, with federal funding and tolls providing substantial revenue for the construction.

P-094-004

The alternatives evaluation and screening process, described in Chapter 2 of the FEIS, considered a wide range of alternatives. Proposals that arose after the DEIS was developed were also considered. The rationale for the Selected Alternative is described in the ROD and in Chapter 2 of the FEIS.

Hines, Maurice

From: Savannah Teller-Brown [savannahteller@gmail.com]
Sent: Monday, October 24, 2011 8:23 PM
To: Columbia River Crossing
Subject: oppose

P-095-001

i am writing to express my opposition to the columbia river crossing.
it just doesn't make sense environmentally or financially.

thank you,

savannah teller brown
NE portland

P-095-001

Significant work has gone into developing the CRC project, including an ongoing public involvement effort. The public involvement program includes numerous advisory groups to ensure that the values and interests of the community are reflected in project decisions. These groups include representatives of public agencies, businesses, civic organizations, neighborhoods, and freight, commuter, and environmental groups. Feedback from the general public and advisory groups has been generally supportive of the project, including support for the transit, bicycle, pedestrian, highway, interchange, and financing elements of the project. See Chapter 2 (Section 2.7) of the FEIS for more discussion on the process used to develop project alternatives and select a Locally Preferred Alternative.

Hines, Maurice

From: Richard Thomas [rtcouv@gmail.com]
Sent: Monday, October 24, 2011 5:20 PM
To: Columbia River Crossing
Subject: CRC

To whom it may concern:

P-096-001

I have lived on both sides of the Columbia and in east and west Portland metro for about 30 years and have a front row seat to the efforts to handle mass transit. What we have devolved to today is a huge industry in this area devoted to massive projects totally isolated from the realities of public opinion and fiscal prudence.

The heart of the CRC project is the unilateral DEMAND from Portland to include light rail. Once again, the people of Vancouver and Clark County have said no. Metro Portland voters said NO-- twice.

P-096-002

But you know all of this, as well as the dismal financial performance of the existing system. You have ignored facts and statistics that refute the value of such a huge proposal. To date, the CRC syndicate has spent well over $100 million in an attempt to force the issue. No independent analysis will ever justify the existing plans, but onward you go.

P-096-003

Of the many unintended consequences from the current plan is the loss of revenue to Portland area businesses. Put a toll on these bridges and many people will factor that in to whether to shop in Oregon. The savings on sales tax will not be enough to breach the physic barrier created by a toll.

P-096-004

WE the People, don't want it, can't afford and won't stand for it. You cannot cram this monstrosity down our throats.

Richard Thomas
Vancouver, WA

360-241-5228

--
Richard Thomas

P-096-001

Light rail has been endorsed by every local Sponsoring Agency (Vancouver City Council, C-TRAN, RTC, Portland City Council, TriMet, and Metro), whose boards include elected officials from throughout the area.

Annual light rail passenger trips crossing the I-5 bridge in 2030 are projected to be 6.1 million, with daily ridership around 18,700. The travel time for the morning commute by light rail between downtown Vancouver and Pioneer Square in downtown Portland will be approximately 34 minutes. Light rail would travel on a dedicated right-of-way, with more reliable travel times than auto drivers dealing with unpredictable road conditions, traffic congestion, and parking challenges.

The CRC project planning for light rail incorporates and supports the principles of Vancouver's City Center Vision Plan. Downtown Vancouver has seen recent growth in higher density mixed use projects from three to 12 stories in height. In addition, another 4,000 downtown condominiums are proposed or pending as part of new developments. The core of Vancouver has, along with many of the larger corridors such as Fourth Plain Blvd, medium to high density residential development and an urban mix of uses. Transit demand in these areas is quite high, and ridership will increase with the introduction of light rail.

Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on having a public vote.

P-096-002

All specific comments and criticisms received have been considered. The FEIS analysis and findings show benefits from the selected alternative, as well as adverse impacts. Independent analysis was provided on many topics, as discussed in the FEIS.

P-096-003

This issue was addressed as part of the economics analysis and is described in detail in the Economics Technical Report. This report, and Chapter 3 (Section 3.4) of the DEIS, note that the increased costs incurred because of tolls would generally be offset by the improved travel options and travel times. Under existing and No-Build Alternative conditions, congestion delays and high crash rates have significant costs for local businesses and travelers; improving these conditions is one of the purposes of the project.

Tolls could discourage home-based shopping trips from Clark County to points in northern Oregon, such as Hayden Island and Airport Way. However, the variable-rate toll structure that was evaluated in the DEIS allows for different rates to be charged by time of day. Therefore, discretionary trips, such as those between Oregon and Washington for retail purposes, could be taken in off-peak hours when toll rates are at their lowest, reducing the effect of the tolls on these types of trips. Also, CRC would provide improved transit connections between Clark County and Oregon, offering travelers a toll-free alternative for reaching destinations across the river.

P-096-004

Significant work has gone into developing the CRC project, including an ongoing public involvement effort. The public involvement program includes numerous advisory groups to ensure that the values and interests of the community are reflected in project decisions. These groups include representatives of public agencies, businesses, civic organizations, neighborhoods, and freight, commuter, and environmental groups. Feedback from the general public and advisory groups has been generally supportive of the project, including support for the transit, bicycle, pedestrian, highway, interchange, and financing elements of the project. See Chapter 2 (Section 2.7) of the FEIS for more discussion on

the process used to develop project alternatives and select a Locally Preferred Alternative.

From: Robert Tice [mailto:robtice2@gmail.com]
Sent: Sunday, September 25, 2011 7:05 PM
To: Columbia River Crossing
Subject: Final Environmental Impact Statement.

P-097-001

Please advise as the authority for a charge of $60 for a written copy of the statement.

Please promptly forward the profered C.D. of the Columbia River Crossing Final Environmental Impact Statement AND, if allows, an Executive Summary of same to:

Robert Tice
515 West 21st Street
Vancouver, Wa. 98660

Thank you,

Robert L. Tice

P-097-001

A response and these materials were provided on the 28th of September.

Hines, Maurice

From: Stephanie Turlay [bsturlay@comcast.net]
Sent: Monday, October 24, 2011 11:56 AM
To: Columbia River Crossing
Subject: CRC

P-098-001 With so many discrepancies in the CRC project, some critical, why has no one from the CRC owned any of them? Corrected them? Explained them?

Stephanie Turlay
bsturlay@comcast.net

P-098-001

Multiple methods have been used to engage the public so as to address the needs of a wide variety of people in the project decision-making process. Public feedback has helped guide the outreach effort. Examples include workshops with facilitated small-group discussions, open houses where participants can talk one-on-one with staff, public hearings, presentations and discussions at community and neighborhood-sponsored meetings (often at the group's request), and advisory group meetings where CRC seeks recommendations from a citizen committee. These events and meetings have taken place at a variety of locations, days of the week, and times of the day to meet the needs of the entire community. For more information on the project's public outreach, please see Appendix B (Public Involvement) of the FEIS.

Hines, Maurice

From: Tweet [tweetfamily@comcast.net]
Sent: Monday, October 24, 2011 10:54 PM
To: Columbia River Crossing
Subject: Feedback on the proposed Columbia River Crossing project, please confirm you got this message by reply

P-099-001

I am against the CRC project as currently planned. I am a Ph.D. physicist working in industrial research for over 20 years with 75 US patents and over 75 technical publications. So, I know something about math, logic, and reasoning.

1) **No Need for Light Rail.** The numbers and case made for the CRC makes no sense to me whatsoever. In particular, the demand that ¼ of the cost be spent on light rail is completely absurd. I have spent 9 years of my life living in Japan. I know what high density conditions are like, where a train system is a necessity. We have nothing like that here in the Vancouver area, and we are unlikely to have anything remotely approaching a need for light rail in the next 100 years. Indeed, at least two of the local public officials who are cheerleaders for this project have admitted in writing or public meetings that light rail is a want, not a need, and probably won't be a need for 20-30 years. We have far more important and useful ways to spend our tax money (or not spend it, since we are simply borrowing it from our great-grand children).

P-099-002

2) **False Projections**. The projections used by the CRC to justify this project have already been proven to be false. In particular, traffic projections made in 2006 have already found to be significantly overestimated. But the lie is perpetuated, since these same false projections are being used in the EIS to continue to justify the CRC plan with light rail! This is a blatantly dishonest practice! If I did this in my job, I would justifiably fired on the spot! It seems only the government can get away with this! Bernie Madoff would be proud! If they can't predict 5 years in the future, how are we to believe their projections 30 years into the future?

P-099-003

3) **Light Rail is the Most Inflexible and Expensive "Solution" to Traffic Problems**. I find this obsession with light rail to be completely illogical. To spend ¼ of the cost on a totally inflexible and exorbitantly expensive system that serves only 2 to 3% of the commuters makes no sense at all. Why go with the most expensive solution? Buses are far cheaper and vastly more flexible than trains. HOV lanes are nearly free and can be extremely effective. There are much easier solutions.

P-099-004

4) **Trains are Old Technology**. One of the areas I work on is renewable energy, including solar and batteries. This last May I was at a research conference on electric vehicles held at Pacific Northwest National Lab in Richland Washington. Famous scientists and engineers from all over the world were there describing the amazing progress being made in new battery technology. Prof Yet-Ming Chang of MIT showed some particularly impressive work with his new "ooze" battery, and had formed a company, M24, to commercialize it. Prof. Chang has already successfully commercialized other battery technologies with his company, A123 Systems. My point is that, in 20 to 30 years we may all be driving electric vehicles. We may also be driving vehicles that practically drive themselves, so that rush hour traffic can be much denser, yet safer. Some of this technology is already coming to market. So, why lock ourselves into trains running on fixed tracks, a 19th century technology, when we live in the 21st? After all, 20 years ago, the Prius wasn't even on Toyota's drawing board yet!

P-099-001

Light rail has been endorsed by every local Sponsoring Agency (Vancouver City Council, C-TRAN, RTC, Portland City Council, TriMet, and Metro), whose boards include elected leadership from throughout the area.

Annual light rail passenger trips crossing the I-5 bridge in 2030 are projected to be 6.1 million, with daily ridership around 18,700. The travel time for the morning commute by light rail between downtown Vancouver and Pioneer Square in downtown Portland will be approximately 34 minutes. Light rail would travel on a dedicated right-of-way, with more reliable travel times than auto drivers dealing with unpredictable road conditions, traffic congestion, and parking challenges.

The CRC project planning for light rail incorporates and supports the principles of Vancouver's City Center Vision Plan. Downtown Vancouver has seen recent growth in higher density mixed use projects from three to 12 stories in height. In addition, another 4,000 downtown condominiums are proposed or pending as part of new developments. The core of Vancouver has, along with many of the larger corridors such as Fourth Plain Boulevard, medium to high density residential development and an urban mix of uses. Transit demand in these areas is quite high, and ridership will increase with the introduction of light rail.

Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on having a public vote.

P-099-002

Traffic forecasts reported in the DEIS and used to inform decisions on a locally preferred alternative were derived from adopted regional employment and population forecasts, and from state-of-the-art modeling and evaluation conducted by Metro, RTC, and the project team. These

P-099-005

5) **No Trust in Management of Project.** The gross mismanagement of this project by the CRC, along with the arrogance and obscene over-charging of taxpayers by the primary vendor, Dave Evans and Associates is enough to justify cancelling the project and starting completely over with a totally new cast of characters. This is detailed in the excellent reports by the Forensic Auditor, Tiffany Couch. Dave Evans and Associates is even suing to keep from having to explain how they have spent millions of dollars they have gotten from Washington State taxpayers. That alone should be reason enough to ban them from bidding on any more government projects.

P-099-006

6) **Demand for County-Wide Vote.** Before this project is settled, all voters in Clark County (and perhaps surrounding counties) who will be forced to pay for this farce must be allowed to vote on it, at the very least whether light rail should be included. To do otherwise is to force this down our throats and is unconscionable, and should be illegal, if it isn't already.

Sincerely,

Douglas J. Tweet, Ph.D.
2715 NW 34th Circle
Camas, WA 98607

traffic forecasts were reviewed by all project sponsor agencies as well as FTA and FHWA.

An independent panel of traffic modeling experts was convened in October 2008 to review the modeling methods and findings. These experts concluded that the project's approach to estimating future travel demand was reasonable and that it relied on accepted practices employed in metropolitan regions throughout the country. These findings are summarized in the "Columbia River Crossing Travel Demand Model Review Report" (November 25, 2008). This independent review confirmed the CRC modeling approach used to address multiple variables that can affect travel demand, including gasoline prices, tolling, travel demand measures, and induced development.

The number of trips on I-5 across the river is projected to reach 184,000 in 2030. Even if this level of traffic did not occur until 2050, the facility would still need to accommodate it. And the facility is intended to have decades of functional service.

P-099-003

As illustrated in the DEIS, and summarized in Exhibit 29 (page S-33) of the Executive Summary, light rail would better serve transit riders than bus rapid transit (BRT) within the CRC project area. Light rail would carry more passengers across the river during the PM peak, result in more people choosing to take transit, faster travel times through the project area, fewer potential noise impacts, and lower costs per incremental rider than BRT. Additionally, light rail is more likely to attract desirable development on Hayden Island and in downtown Vancouver, which is consistent with local land use plans.

High occupancy vehicle (HOV) lanes work when they are part of a network, and could potentially be a useful tool in the CRC area if employed as part of a regional plan. The five-mile CRC project by itself is

too short in length to provide the true benefits of HOV lanes, but should the region adopt and develop an HOV system, lanes within the bridge influence area could potentially be designated as part of the network.

The CRC project team has looked at HOV lanes and freight lanes, which are typically located on the inside freeway lane next to the barrier, as part of its technical analysis. Because about 70 percent of the vehicles enter and/or exit I-5 within the five mile study area, access to and from a HOV lane or freight lane could create traffic operational problems by increasing lane changes (for example, HOVs entering the freeway and needing to merge all the way to the inside lane). The results of this analysis are described in more detail in Section 3.1 of the DEIS.

P-099-004

Changing technology, peak oil, and other projections of future conditions have been considered. While automated personal vehicles could eventually dramatically increase interstate capacity, it is not likely to eliminate or significantly diminish the demand for public transit, particularly in the foreseeable future. Mode choice depends on much more than just the volume-to-capacity ratio of interstate links. For example, parking capacity and cost are also significant factors in mode choice. See the CRC Traffic Technical Report for further discussion of factors that affect mode choice.

P-099-005

Past financial performance is an important issue but is not relevant to the NEPA review process. The Record of Decision concludes the NEPA analysis. It indicates which alternative has been selected by the federal government, and allows for the continued design, eligibility for federal funding and permitting, and eventual construction of that alternative. The Locally Preferred Alternative is supported by local, regional, state, and federal agencies and has been selected following an exhaustive analysis and public involvement program.

The project takes the issues of financial management very seriously. The project is currently developing new financial reporting mechanisms and has started providing monthly reports on the internet. The project will continue to work with the public to improve transparency and an understanding of the resources required for an undertaking of this scale.

P-099-006

There will not be a public vote on construction of the various CRC project elements. However, as a public project, it must be approved and funded by the decisions of elected officials who are themselves directly elected by voters. Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on pursuing a public vote.

Hines, Maurice

From: Tweet [tweetfamily@comcast.net]
Sent: Monday, October 24, 2011 11:32 PM
To: Columbia River Crossing
Subject: CRC feedback. please confirm receipt.

CRC- feedback

P-100-001

1)The proposed replacement bridge adds no thru lanes, only merging lanes. An earlier phase of the project did include an added thru lane in each direction, and no reasonable justification is given for cutting that out. To rebuild the bridge without any added thru capacity will not help traffic flow.

P-100-002

2)"According to the Regional Transportation Council, the bridge carries about 3,300 transit trips per day. That means only 2.4 percent of all trips that cross the bridge are on public transit. Adding light rail to the bridge would increase costs by about $1.17 billion. This means local officials want to spend 40 percent more in order to serve 2.4 percent of total bridge crossings." click link

3) Local officials have noted that light rail in Clark County is a want, not a need. Supposedly, it may become more practical in 20-30 years. Yet the CRC insists on building it ASAP. Population and traffic projections used by the CRC are now considered highly inflated and cost estimates are understated based upon outside expert review. When or if population and job density will be high enough to support light rail remains to be seen. Today, job losses and foreclosures dominate the outlook, and growth remains uncertain. Meanwhile, CRC racks up $$MILLIONS in charges with insufficient explanation of how public $$are spent. A forensic accountant has analyzed the financial documents.
"*She found that the CRC was unable to adequately account for how it spent $108 million in public funds between July 2005 and February 2011. Oddities included invoices totaling $15 million lacking vendor names and invoices worth $38 million that lacked codes to identify services rendered*" The general contractor has since filed in court to keep financial records from public scrutiny. Follow the $$$link

4)What will transportation technology be like in 20 years? Why spend $$we don't have today for something we may not need in 20 years? With rapidly changing technology, closer timing to reaching true need insures the best options available are selected.
What is higher priority? Roads that serve all, or light rail that serves only passengers travelling to limited destinations? Roads carry freight that stocks stores, medical centers and businesses, specialized service vehicles and trucks , and emergency vehicles. Roads provide flexibile routes to more destinations for buses, vanpools, or carpools that serve public transit needs.
Light rail is limited to fixed routes and still requires time consuming transfers to bus for many destinations. On the Oregon side, light rail doesn't come near enough to the businesses to make it practical. Transfer to a bus is needed, so that starting out on a bus is less time consuming in the long run.

5)What is more cost effective? Light Rail costs of $237 million/ mile in Seattle and $204 million/ mile in Portland far exceed the cost of building and maintaining roadways.
Why light rail? Mass transit options like light rail and bus rapid transit have been eligible for federal pots of gold, creating incentives to build regardless of the cost. Those connected to the light rail business are some of the strongest proponents for it.

P-100-003

5)Locally Preferred Alternative?
The following cities have a representative on the Ctran board.
Battleground, Ridgefield/Yacolt, and Camas/Washougal. The same is true for the Regional Transportation Council, RTC.
The representatives for the RTC and Ctran voted on the "locally preferred alternative" of light rail and a replacement I-5 bridge in some cases without the city council members knowing about the vote beforehand. Citizens were not informed of the upcoming vote through a local public hearing on a preferred alternative in any of these cities. Neither did any of these city councils vote to give their C-tran or RTC representative direction in how to vote on the "locally preferred alternative".
Some C-tran representatives explained that they spoke with some of the council about the decision, and it's unclear how much if any of this discussion took place in an open public meeting.

1

P-100-001

Following the selection of the LPA in July of 2008, the CRC Project Sponsors Council (PSC) was developed to provide recommendations to the project on a variety of issues, including the number of add/drop lanes over the river crossing. Over the course of several months, PSC was provided with operational characteristics and potential environmental impacts of 8-, 10-, and 12-lane options. These technical evaluation criteria included, but were not limited to, traffic safety, congestion, traffic diversion onto local streets and I-205, regional vehicle miles travelled, transit ridership, regional economic impact, effects to neighborhoods, and protected species and habitats. In additional to the technical information, PSC received input from CRC advisory groups and reviewed public comment submitted to the project and obtained during two public Q&A sessions in January 2009 regarding the number of lanes decision, as well as hearings conducted by Portland City Council and by Metro Council. In August 2010, the PSC voted unanimously to recommend that the replacement bridges be constructed with 10 lanes and full shoulders, see Chapter 2 (Section 2.7) of the FEIS.

The proposed new lanes are add/drop lanes (i.e., lanes that connect two or more interchanges), which are used to alleviate safety issues associated with the closely spaced interchanges in the project area, and accommodate the 68% to 75% of traffic that enters and/or exits I-5 within two miles of the Columbia River.

P-100-002

As described in Chapter 3 (Section 3.4) of the DEIS and FEIS, and in the Indirect Effects Technical Report, highway capacity improvements and access improvements can induce development in suburban and rural areas that were not previously served, or were greatly underserved, by highway access. The DEIS outlines a comprehensive analysis of the potential induced growth effects that could be expected from the CRC project. A review of national research on induced growth indicates that

P-100-003

In contrast, other cities in Washington openly discuss transportation at meetings and adopt formal motions to give their transit representative direction on how to vote for the city. When I asked about the lack of local public hearings for the approximately $4-8.7 Billion CRC "Locally Preferred Alternative", the response from Camas City Councilor Dietzman and Washougal Mayor Guard was that the law does not require a public hearing. Councilor Dietzman further explained at a Ward meeting that other boards, such as the mosquito board, rarely hold public hearings as a justification for not holding a local public hearing on the CRC "Locally Preferred Alternative".
Nevertheless, it is good practice and open government to hold a local public hearing and take a council vote in each city on such a large regional transportation project. It will impact I-205 bridge traffic from I-5 traffic diverting to avoid the toll. (Which could lead to tolling the I-205 bridge to even out traffic, make it fair, etc). Careful scrutiny is necessary prior to such a building project to insure it best meets our local needs in the most cost effective and efficient manner possible. The best means to find out what the locals prefer is to hold the planned light rail vote, which has been delayed. The vote should be held PRIOR to a final decision to bring light rail in to Clark County.

Will the C-tran board allow Camas and Washougal citizens to vote on light rail and bus rapid transit in 2012? There is no guarantee. If the light rail vote had been held this November as planned, Camas and Washougal voters would have automatically had a vote. However, our C-Tran representative and the CTRAN board voted to delay the promised light rail vote. A law was put in place to allow for a subdistrict vote starting in July 2012, that could cut out Camas and Washougal, and north county voters at the will of the C-Tran board. I believe the C-tran light rail/high capacity transit vote should be district-wide to include all cities in the district since all are taxed for public transportation and all will be impacted if costly light rail is introduced. Regardless of where one lives in the county, all
End up paying the C-tran sales tax when they shop in the larger urban areas where most of the stores are located.

P-100-004

What happened to the 3rd bridge port to port connection that would better handle more traffic?
This option was eliminated without the same serious study the light rail and I-5 bridge replacement was give.
This makes more sense because it connects 2 industrial areas and freight traffic, and alleviates traffic with a new corridor.
From the fairs I attended this summer near the 3rd bridge now booth, it seems it is the "locally Preferred Alternative"
of many as it opens up 2-3 new lanes in each direction for traffic AND freight.

The process is broken. Only one bid from one contractor for one bridge, no local public hearings or votes in the cities supposedly "represented" on the C-Tran or RTC boards, no accounting for $ Millions.

A new crossing should be considered before wasting our transportation $ and consuming the potential for other transportation improvements in our area.

Thank you for your consideration.

Margaret Tweet
2715 NW 34th Circle
Camas, WA 98607

there are six factors that tend to be associated with highway projects that induce sprawl. These are discussed in the Indirect Effects Technical Report. Based on the CRC project team's comparison of those national research findings to CRC's travel demand modeling, Metro's 2001 land use / transportation modeling, and a review of Clark County, City of Vancouver, City of Portland and Metro land use planning and growth management regulations, the DEIS and the FEIS conclude that the likelihood of substantial induced sprawl from the CRC project is very low. In fact, the CRC project will likely support the region's goals of concentrating development in regional centers, reinforcing existing corridors, and promoting transit and pedestrian friendly development and development patterns. The region's goals are reinforced by the project's location in an already urbanized area, the inclusion of new tolls that manage demand, the inclusion of new light rail, and the active regulation of growth management in the region.

In October, 2008, the project convened a panel of national experts to review the travel demand model methodology and conclusions, including a land use evaluation. The panel unanimously concluded that CRC's methods and the conclusions were valid and reasonable. Specifically, the panel noted that CRC would "have a low impact to induce growth… because the project is located in a mature urban area," and that it would "contribute to a better jobs housing balance in Clark County… a positive outcome of the project". These results are summarizes in the "Columbia River Crossing Travel Demand Model Review Report" (November 25, 2008). In 2010, Metro ran the MetroScope model (an integrated land use and transportation model) to forecast growth associated with transportation improvements of a 12-lane river crossing and light rail to Clark College. Even with a 12-lane river crossing, the model showed only minimal changes in employment location and housing demand compared to the No-Build Alternative. For a more detailed discussion regarding potential indirect land use changes as a result of the CRC project, including the likely land use changes associated with the

introduction of light rail, please see Chapter 3 (Section 3.4) of the FEIS.

By 2030, the region's population is expected to increase by one million people. This increase will result in more people needing to travel between home, work, school, recreation, etc. In 2005, 135,000 vehicles crossed the Columbia River on the Interstate Bridge, which led to 4-6 hours of congestion each weekday. By 2030, 184,000 are predicted to cross the river, which would lead to 15 hours of daily congestion if no action is taken. Congestion occurs when vehicle demand is greater than a transportation system's capacity. It results in slower speeds and increased travel times. CRC defines congestion as vehicles traveling less than 30 mph. The Columbia River Crossing project uses information gathered from Metro's nationally-recognized travel demand models to determine the project's effect on congestion. These models predict trip frequency, types or modes of transportation, destination, and time of day. Transportation planners use these models to analyze the effects of such factors as increased population and employment, transportation improvements, and new developments on the transportation system.

Traffic volumes fluctuate and did decrease during some years. Traffic volumes obtained from the Oregon Department of Transportation's automatic traffic recorder (ATR) monitoring sites show that traffic volumes have, in fact, been increasing in the last few years. Whether the traffic volumes forecast for year 2030 will actually be achieved in that year should not be the only consideration. In its July 27, 2010 report, the Independent Review Panel (IRP) expressed concerns about a longer horizon. The IRP commented "The desirability of living in the Portland/Vancouver region is not going to diminish, so populations will continue to grow…. [T]he IRP believes the greatest risk in the decision-making process is not over-sizing the bridges but not building enough capacity for the next 100 years." [1]

Past financial performance is an important issue but is not relevant to the

NEPA review process. The Record of Decision concludes the NEPA analysis. It indicates which alternative has been selected by the federal government, and allows for the continued design, eligibility for federal funding and permitting, and eventual construction of that alternative. The Locally Preferred Alternative is supported by local, regional, state, and federal agencies and has been selected following exhaustive analysis and public involvement program.

The project takes the issues of financial management very seriously. The project is currently developing new financial reporting mechanisms and has started providing monthly reports on the internet. The project will continue to work with the public to improve transparency and an understanding of the resources required for an undertaking of this scale.

Following the close of the 60-day DEIS public comment period in July 2008, the CRC project's six local sponsor agencies selected light rail to Clark College as the project's preferred transit mode. These sponsor agencies, which include the Vancouver City Council, Portland City Council, C-TRAN Board, TriMet Board, RTC Board and Metro Council considered the DEIS analysis, public comment, and a recommendation from the CRC Task Force (a broad group of stakeholders representative of the range of interests affected by the project - see the DEIS Public Involvement Appendix for more information regarding the CRC Task Force) before voting on the LPA.

As illustrated in the DEIS, and summarized in Exhibit 29 (page S-33) of the Executive Summary, light rail would better serve transit riders than bus rapid transit (BRT) within the CRC project area. Light rail would carry more passengers across the river during the PM peak, result in more people choosing to take transit, faster travel times through the project area, fewer potential noise impacts, and lower costs per incremental rider than BRT. Additionally, light rail is more likely to attract desirable development on Hayden Island and in downtown Vancouver, which is

consistent with local land use plans.

[1] Warne, Thomas (2010). I-5 Columbia River Crossing Project, Independent Review Panel, Final Report. Independent Review Panel, Olympia, July 27, 2010.

P-100-003

Over the course of the CRC project, a public involvement program has been used to educate and involve stakeholders and the public in order for them to become active participants in shaping the CRC project. At the time of DEIS publication, the project team had participated in over 350 public events, giving over 10,000 people a face-to-face opportunity to learn about the project and provide meaningful input. In order to encourage the highest levels of attendance as possible, most meetings scheduled by the project team were on weekday evenings or weekends during the day. Meetings have been held primarily within the project area to ensure proximity to those potentially most affected by the project. In addition to public events, the program also enabled significant involvement for those who are unable to attend meetings through the project's website and project update notifications.

Prior to publication of the DEIS, property owners potentially affected by project alternatives were notified directly via mail, and six meetings specifically focused on potential right-of-way needs were held in September of 2007. Extensive outreach has been conducted through distribution of written information in hard copy and electronic form, including comment forms, the creation of a project website, and outreach to local and regional media.

When the DEIS was published, the project's database had grown to over 3,000 e-mail addresses and over 10,000 postal mailing addresses. The database was used to encourage participation in public events and involve the broader community. Through implementation of the public

involvement program, over 3,000 public comments were received before publication of the DEIS and over 1,600 comments were received during the 60-day DEIS comment period. In addition, since the DEIS comment period there have been numerous community meetings, open houses, and public hearings by project sponsors, providing more opportunities for public input and comment.

Please see Appendix B of the FEIS for a broader discussion of the public involvement program, including a list of public involvement events that have occurred related to this project. There will not be a public vote on construction of the various CRC project elements. However, as a public project, it must be approved and funded by the decisions of elected officials who are themselves directly elected by voters. Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on pursuing a public vote.

P-100-004

The 3rd bridge port to port crossing idea was evaluated and removed from consideration, as discussed in Chapter 2 of the FEIS. No additional analysis was required to know that it did not address the identified needs for the CRC project. Other locations for a new crossing were also considered and removed from consideration because they could not adequately meet the purpose and need.

The C-TRAN board and Regional Transportation Council both voted on and approved the locally preferred alternative.

Victor F. Viets
421 N. Tomahawk Island Drive
Portland, Oregon 97217

Nancy Boyd
Director
Columbia River Crossing
700 Washington Street, Suite 300
Vancouver, WA 98660

October 22, 2011

Subject: FEIS Comments

Dear Ms. Boyd

P-101-001

I'm a supporter of the Columbia River Crossing Project but I'm a passionate supporter of protecting and improving the quality of livability for Hayden Island residents. My attached comments on the CRC FEIS identify a number of unresolved conflicts between the CRC Project and the quality of future livability on the Island.

My main concern is that there are several instances where the CRC seems to be backing away from commitments made previously to the Hayden Island Community. For example, I believe both the IPS and the Project Sponsors Council voted unanimously, after months of work with the community, to include the local multimodal bridge in the LPA Hayden Island Interchange, but now we learn it is only an option and that the earlier design is still being considered. Also, the Portland Working Group and CRC consultants worked for months to develop innovative designs for the Hayden Island LRT Station, but now those designs aren't mentioned and a minimal standard station design is shown in the FEIS.

There is also some new information that has never been discussed with the Island community. For instance, there are several newly disclosed business displacements, including the Island's only gas station, along North Jantzen Drive in an area where Island residents have worked with CRC and ODOT staff to reduce the roadway footprint enough to save those businesses.

I do not expect my concerns to be resolved before the ROD but I would appreciate written responses to my FEIS comments from the CRC and a reconfirmation that the CRC will honor its previous commitments to the community and will work openly with the community to find solutions to the remaining conflicts before final design commitments are made.

Respectively

Victor Viets

NEW Columbia River Crossing FEIS Issues for Hayden Island

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P-101-001

Option A, which includes the local multimodal bridge to the island is a firm commitment of the project. The Record of Decision will be based on Option A, including the bridge. And though the Hayden Island station design has evolved, the project remains committed to an innovative design which is based on community input. The design of the station has changed over time because the main roadway and structural designs have changed on the island.

The Portland Working Group (PWG) was formed in May 2009 to advise the project on transit related issues for the Oregon side of the project, using the LPA and Hayden Island Plan as the basis for discussion. Beginning in September 2009, the PWG held a series of three interactive design workshops with CRC project, TriMet, the City of Portland staff and the general public to develop a set of design principles. The design principles capture the community's values while remaining broad enough to apply to the future station design regardless of CRC project decisions that may affect the position of I-5, local road circulation, and land development patterns.

The resulting Hayden Island Light Rail Station Conceptual Design Report (CDR), published January 2010, provides guidance to the CRC project, TriMet, and the City of Portland regarding the Hayden Island station design. PWG members reviewed and approved the report. The CDR solidified the Hayden Island Light Rail Design Principles. CRC is committed to work with the community to advance the station design. Station design work will take place during final design. The Hayden Island LRT station cross section illustrations in the FEIS shows a conceptual design with place holders for station elements. The illustration shows the Hayden Island LRT station as an elevated station with a center platform. Again, the project will continue to work with the Hayden Island community to refine the station area design.

		--Victor Viets 10/13/11
	Topic **FEIS Reference**	**Comment** **Recommendation**
P-101-002	LPA Option A & Option B Ch.2 Pg 2-9	How did the local multimodal bridge become an option without public discussion when it was unanimously approved by the Integrated Project Staff (IPS) and the Project Sponsors Council? Also, the East Side Multi-Use Path (MUP) is now an option in combination with the local bridge. These are the only options in the entire project. No basis for the final decision about which option to build is provided. Recommendation: Delete Option B
P-101-003	"New" Business Displacements and cumulative community impacts Ch. 3 Pg 3-86 – 3-88	Project will now displace 39 island businesses serving primarily local clientele at a loss of $62.7 million in annual sales and 643 local jobs. "New" business displacements announced in the FEIS include the Chevron station (the only gas station on the Island), the car wash, Taco Bell and the Wells Fargo Bank (one of only two banks on the Island). These "new" displacements have not been discussed with the community even though the Island circulation plan and street widths have been discussed extensively in the last two years with CRC and ODOT. During that time, the Island community was assured by the ODOT Director that local concerns would be considered and that on-island interchange access streets would be downed-sized where-ever possible to reduce impacts to the community. Instead, more businesses have been displaced. Also, the ODOT Interchange Area Management Plan has not been developed for the HI Interchange so the public has had no opportunity to review the on-island traffic circulation, access changes to businesses, and justification for permanent business displacements. The LPA now displaces virtually every local business on the Island but the FEIS does not recognize that as major impact on community livability. Recommendation: Follow Oregon DOT rules and prepare an IAMP with public input. Honor previous commitments to the community and reduce width of new streets to reduce displacements. Provide community planning and financial assistance to replace lost local retail service businesses.
P-101-004	Hayden Island LRT	The HI LRT Station is now shown as a standard TriMet design

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As with the light rail station, displacements on the island have changed as the designs have advanced. And, when project staff have found access and other impacts to properties, which have as yet unknown ramifications for the businesses, these businesses have been identified as displacements. Thereby, project staff have potentially overestimated the number of displacements, and is eager to work with individual businesses to retain their operations on the island. This is particularly the case for some of the businesses east of the Interstate, where only small portions of the property may need to be acquired.

P-101-002

The Record of Decision is based on Option A. Although Option B was carried into the FEIS, it is not the design that will be constructed. There will be a local multimodal access provided to the island.

P-101-003

Refinements and new information resulted in additional displacements. We do not expect that all the businesses assumed to be displaced will necessarily have to be displaced, but it is prudent to be conservative about impacts in the NEPA process. Also, some of the displacements would be affected only by diminished access, not by demolition. It is possible that some of these properties and buildings could be re-occupied by other businesses that would not be so affected by the changes in access.

As the design is advanced there may be ways to avoid some displacements, through modification of the proposed new streets. However, it is also important to provide new streets that satisfy the City's requirements and those of the Hayden Island Plan. There should be adequate sidewalks, travel lanes, and other elements to the islands new, "complete" streets.

P-101-004	station design Ch. 2 Pg 2-25	without a station shelter. The earlier designs that were developed by the CRC PWG with a renowned consultant and with extensive community input are not included. The elevated HI LRT station is in a cold and windy location and needs a station shelter to protect riders. The station design is supposed to be an attractive focal point for the community and an iconic entry point for Oregon. There is no discussion of local handicapped parking at the LRT station and no mention of planned closure of the existing park and ride at Expo station. Many in the community will be forced to drive to Delta Park to use the LRT because there will be no station parking and no local bus service. There is no discussion of an east-west shuttle bus service to help Island residents get to a LRT station or to any regional bus stop during construction or operation. Recommendation: Reinstate the attractive LRT station designs. Add a handicapped parking lot or a local permit-required parking lot to the HI LRT station for Island residents. Provide east-west shuttle bus service on the Island at least through the construction period.
P-101-005	Location of Stormwater Treatment Facilities on Hayden Island Pg 2-16 and 2-17, various other sections.	Stormwater Treatment Wetlands now occupy the entire site of the future local retail center shown in the HI Island Plan but this is NOT identified as an impact to the community. Also, one of the Treatment Wetlands is located on the Columbia River shoreline in a future shoreline park. Again, this is in conflict with the Island Plan and not identified as a community impact. We have repeatedly asked CRC to move these treatment facilities to comply with the Island Plan. The answer from the CRC has always been don't worry, these locations are only placeholders until we get to design. Now it's design time, the stormwater facilities still violate the Island Plan, and the FEIS says, in effect, don't worry, there are more studies to be done before a final decision. In the mean time, the treatment method has changed from small infiltration basins to treatment wetlands which take up over twice the area of the basins. Once they are memorialized in the FEIR and ROD, what are the chances of a change in treatment method or location? Recommendation: Relocate the Stormwater facilities to avoid violations of the Island Plan. The open areas within the new Marine Drive Interchange appear to be a viable location. On-bridge treatment could significantly reduce the on-shore acreage.

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P-101-004

Please see the response to P-101-001 regarding the Hayden Island Light Rail Station Conceptual Design Report. The Hayden Island Light Rail Design Principles are:

- Create a station environment that is safe, attractive, and inviting for transit users, visitors, and island residents
- Provide circulation paths that allow clear connections to or through the station area for users of all modes with varied abilities
- Develop a station area that embraces and engages its surroundings with transparency and activity
- Design a station that protects transit users from freeway noise and the natural elements, while providing light, views, and clear way-finding
- Design a station that includes features referencing historical or cultural values unique to Hayden Island

CRC is committed to work with the community to advance the station design. Station design work will take place during final design.

The Hayden Island LRT station cross section illustrations in the FEIS shows a conceptual design with place holders for station elements. The illustration shows the Hayden Island LRT station as an elevated station with a center platform. Again, the project will continue to work with the Hayden Island community to refine the station area design.

At the December 2010 PWG meeting, TriMet representatives discussed bus service. TriMet will work closely with the contractors during CRC construction to ensure that Line 6 continues service to Hayden Island. When developing a bus service plan along a new light rail line, TriMet re-evaluates all bus service within the vicinity of the new line with the intention of maximizing ridership and limiting service duplications. As part of this process, TriMet conducts ridership, cost, and operational

P-101-006	Stormwater Treatment Methods and Impacts Ch. 3, Pg. 3- 342 to 3-350	Stormwater Treatment Wetlands on Hayden Island will have adverse impacts on the Island that have not been evaluated. As discussed above, the locations of the constructed wetlands are in direct conflict with the Island Plan but they also significantly increase the footprint of the CRC project. The permanent standing water in the wetlands will undoubtedly create a breeding ground for mosquitoes and the vegetated shorelines may be used by nutria and other nuisance wildlife. Since the wetlands will be trapping contaminants from the stormwater in the sediments and vegetation, I assume the facilities will be closed to the public and may be fenced. They do not seem to be appropriate facilities for a developed urban area. Stormwater entering the treatment wetlands does not fully infiltrate into the groundwater but rather is discharged back to the Columbia River. No information is provided to evaluate the quality of these discharges but it seems obvious that at least the discharge temperature will be elevated and dissolved oxygen will be lowered so the discharge may not meet ambient water quality standards. Other treatment methods are available that could reduce impacts on Hayden Island. Proprietary systems using filtration canisters require much less space and could be located on the bridges or in a below grade structure near the bridge landing. <u>Recommendation:</u> Revise the stormwater treatment facilities to avoid adverse impacts on the Island community.
P-101-007	CRC Impact on HI future parks and shoreline access Ch. 3, Pg. 3-189, 3-207 & 3-208	The future waterfront park areas under the CRC landings that were identified in the Island Plan are not discussed in the FEIS. The CRC project makes no provisions for these public facilities even though the community has repeatedly asked that right-of-way lands under the landings of the existing and new bridges be made available for shoreline access and park use. This failure to provide public access is not identified as an impact on the community and is in violation of the Island Plan. We have repeatedly asked for this CRC project land to be made available for public use. In stark contrast, on the Vancouver side of the river, the CRC project has worked with the City of Vancouver to create park areas at the bridge landing and has indicated they will donate surplus land for park use.

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analyses. TriMet seeks input from the following community groups:

- Customers and operators
- Neighborhood associations
- Business groups
- Social service agencies and organizations serving seniors and people with disabilities
- Citizen advisory committees
- Jurisdictional leaders and staff

The project will work with TriMet and the Hayden Island community to develop a bus service plan during construction and after light rail opens in 2019. A circulator service, perhaps with shuttles, will be developed during the bus service planning public process that will begin two years prior to the start of light rail.

On-street parking is shown in the current roadway designs for Tomahawk Island Drive. The project will work with the City of Portland and the Hayden Island community to refine the parking designations near the LRT station. Delta Park will serve as the nearest park and ride to the Hayden Island light rail station, a distance of 1.17 miles from the Hayden Island light rail station. The distance between the park and ride lots at Expo Center and Delta Park is 0.69 miles.

P-101-005

The stormwater facilities shown in the FEIS will continue to be refined as design work progresses. Under the terms of the biological opinion (BO), the CRC project must treat stormwater runoff using bioretention, bioslopes, infiltration ponds, porous pavement, constructed wetlands, and vegetated and soil amended swales designed for infiltration. Based on the information we have on file, stormwater runoff is currently not treated before being released to North Portland Harbor or the Columbia River.

P-101-007		Recommendation: Provide for public access and park use for the existing and new Columbia River and North Portland Harbor Bridge landing areas. Donate surplus Doubletree property for park use after project construction is completed. This donation would be as partial mitigation for community impacts.
P-101-008	No Mitigation for Community Livability Impacts Chapter 3	The FEIS makes a case that: 1. final design will be consistent with the Island Plan; and 2. The Island will experience only long-term "general" impacts on community livability(What is a general impact???). These claims have not been demonstrated given the facts: ----The island will be cut in half by a very un-neighborly concrete barrier that will extend across the entire island and will be 4-6 stories high and several city blocks wide. This will be a major visual and physical divider of the community---much more-so than the current ground-level freeway. ----The project will displace virtually all of the locally oriented retail businesses with a loss of 643 local jobs. The losses will include the only grocery store providing full service bakery, meat, and fresh produce departments; the only gas station; the car wash, one of the two banks, and virtually all the local restaurants. The FEIS offers only mitigation by buyouts of business owners who can then leave the Island. No mitigation is offered to island residents who have lost a large percentage of their local service businesses, other than a suggestion that we buy a bus ticket to take us off the island for shopping for the next 7-10 years. Similarly, the business owners get a fair market buy-out but their 643 employees get no mitigation other than a suggestion that they might qualify for temporary CRC construction jobs. Some unknown portion of these lost jobs is held by Island residents so they may have to move to find work. -----The project will preclude future development of the neighborhood retail center called for in the Island Plan and appears to deny public use of the state-owned-lands for planned shoreline parks. These were key pieces of the Hayden Island Plan because they provided a basis for local business recovery and long term livability

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The Hayden Island Redevelopment Plan states that runoff from local streets will be treated in roadside planters and that CRC stormwater will be managed in a "green, state-of-the-art manner." Although the Hayden Island Plan map did not show the constructed wetlands, these are a "green" concept for stormwater treatment, and have been shown in project designs as early as May 2009. The stormwater treatment proposed in the FEIS does include the "green streets" approach proposed in the Hayden Island Redevelopment Plan to the extent feasible. This approach to stormwater treatment is not suitable for streets located under bridges (where it will be difficult to establish plants) or where streets are at or below the seasonal high groundwater table. We will continue to review the developing design to determine whether additional streets lend themselves to this method of runoff treatment. Regardless, the project still needs to manage runoff from almost 28 acres of impervious area consisting of I-5 pavement across Hayden island, associated ramps, the elevated transit guideway, and structures.

P-101-006

The Hayden Island Redevelopment Plan map does not show any specific locations to manage and treat stormwater runoff from the CRC project or the impact that it will have on the land available on the island for redevelopment; the Plan simply states that stormwater will be managed in a "green, state-of-the-art manner." The current proposed water quality facilities fulfill that requirement. In addition, care was taken to ensure that the facilities are located on land that is either currently owned by ODOT or would need to be acquired for CRC construction, independent of stormwater management. While wetlands are typically permanent bodies of water, they are not stagnant. Water flows through them during the frequent rainfall events producing conditions that are not conducive to mosquito larval development. As stated above, a constructed wetland is one of the BMPs listed by NMFS in its BO as providing the level of treatment necessary to protect endangered species

P-101-008		improvements. The FEIS doesn't recognize these violations of the Island Plan as impacts so there is no mitigation offered. ----The project will permanently displace numerous floating home residents. The only mitigation offered is a fair market buyout, but the floating homes are unique and moorages for them are not available anywhere else in Oregon. The CRC was asked to mitigate these impacts by assisting in the development of a replacement moorage near-by in the North Portland Harbor area. CRC's FEIS response is that permitting a replacement moorage might be too difficult for them (even though CRC has the resources to permit a $3-4 Billion river crossing?). Recommendation: The FEIS should accurately reflect the real and significant impacts on the Hayden Island Community. The CRC should re-open communications with the Community and work with them to reduce impacts and provide community assistance where major impacts can not be avoided.
P-101-009	Potential Impacts of Project Phasing on Hayden Island Livability.	The FEIS only considers phasing of some SR 500 features and some Marine Drive ramps. Completion of those components has been delayed indefinitely. It seems obvious that delay of full funding may delay construction of some other project components for an indefinite number of years. The community impacts of these likely(?) delays have not been identified or mitigated. What components might be delayed on Hayden Island?—The local multimodal bridge? ---The Tomahawk Island Drive extension under the new freeway?---The entire interchange? Hayden Island will already experience the longest construction impact period of anywhere else in the project area (2+ years of property acquisitions/displacements followed by 5-1/2 years of construction). Any delays by project funding would greatly increase the impacts on livability. Recommendation: Provide assurances that Island components will not be delayed more than any other CRC project components or work with the community to

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found in the Columbia River. As such, the discharges are considered by the agency to meet its stringent requirements. We will be further evaluating the potential for infiltration.

P-101-007

The proposed transfer of 0.4 acre of surplus right of way to the City of Vancouver is mitigation for the project's direct impact on the City's Waterfront Park, an existing public park and a Section 4(f) resource. The project has no impact to public parks on Hayden Island and no land that is subject to Section 4(f) protection, and therefore no need for such mitigation. The CRC project does not currently propose to convert the existing Thunderbird site on Hayden Island into a public park, but it also does not preclude it from becoming a public park in the future. Decisions regarding the disposal of surplus property after project construction will be made at a later date. The City of Portland has also noted their interest in that parcel following construction and the project has committed to continue coordinating with them on it.

P-101-008

Project refinements and new information resulted in additional displacements since the early planning phases of the project. We do not expect that all the businesses assumed to be displaced will necessarily have to be displaced, but it is prudent to be conservative about impacts in the NEPA process. Also, some of the displacements would be affected only by diminished access, not by demolition. It is possible that some of these properties and buildings could be re-occupied by other businesses that would not be so affected by the changes in access.

The character of central Hayden Island is changing, and the project will contribute to further changes. The project is consistent with the direction embodied in the Hayden Island Plan. The multi-million dollar improvements that result from the project will help facilitate redevelopment on the island. The redeveloped commercial areas will, if

P-101-009		develop contingency plans and mitigation measures.
P-101-010	Transportation Impacts on Hayden Island during Construction Ch. 3 Transportation	The FEIS discusses impacts and mitigation for pedestrians, bicycles, handicap scooters and other non-vehicle movements in a north-south direction along the freeway corridor but not in an east-west direction across the corridor. East-west movements are particularly important on Hayden Island because there in no way around the project construction area. Also, there are no existing adequately sized or safe sidewalks, bike lanes or ADA-compliant pathways across the existing freeway so temporary facilities will have to be built before any construction can begin on the Island. Recommendation: Work with the Island community to plan and construct safe non-motorized crossings for east-west movements, as well as north-south movements during construct. Implement an east-west shuttle bus service on the Island to minimize risks to Island residents trying to cross the freeway construction zone.

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consistent with the Hayden Island Plan, better serve local residents than the regional commercial/ big-box uses there now.

P-101-009

The project will seek funding for the construction of the LPA in its entirety. And although there are limited funding opportunities and limited available funding, this project is recognized by our federal partners as having national significance. We are optimistic that being designated one of a few Corridors of the Future will assist us in obtaining the necessary funding.

The project will be built in stages. These stages will be dictated by the variety of contracting mechanisms that will be used, the in water work window, and available funding. Chapter 2 of the FEIS shows how the work will most likely progress. In the event that portions of the project need to be phased, the decision on which portions would include public input and a formalized process. NEPA allows for a sequenced progression of construction. However, if portions of the project were to be significantly delayed, NEPA reevaluations would likely be required.

P-101-010

The project will be developing a shuttle bus system to mitigate mobility impacts on the Island during construction. There will also be plans to protect east-west mobility on the Island during construction for vehicles, bikes, and pedestrians.

P-101-011

FEIS does not meet NEPA requirements for evaluation of bridge type alternatives Appendix O	The CRC hired a panel of internationally renowned bridge architects and engineers to develop new bridge type alternatives to replace the non-viable bridge type that had been the LPA for several years. The panel developed three alternatives including two that exceeded the previously used bridge height criteria. After reviewing the height criteria, the expert panel concluded the taller structures could be permitted and constructed. The three alternatives were then presented in public meetings, discussed in the press, and discussed extensively among public stakeholder groups, politicians, and the CRC. At some point, the CRC terminated their evaluation and selected their own version of the deck truss bridge type without revealing their decision to the public. The CRC deck truss version was curved while the expert panel's version was straight. As a result, the CRC deck truss version has more bridge piers in the Columbia River than any of the panel's three alternatives and the CRC's version is the only option that impacts the environmentally sensitive shallow water habitat on both shorelines. This process was flawed for several reasons: --The CRC did not do an adequate NEPA-based evaluation of the alternatives and did not include their selected design in the evaluations. --The FEIS does not include documentation of the bridge-type alternatives and their environmental or economic comparisons. --The DEIS and FEIS continue to rely on a flawed height criteria decision made in 2006, before the DEIS, that eliminated tall cable-stayed, suspension, and steel bridge types that are commonly used throughout the country. It appears that a major reason for the height criteria was for the convenience of the CRC so they could avoid FAA permitting relative to Pearson Airfield. Pearson Airfield officials and the Pilot Organization that uses the Airfield have recently said that a tall bridge would not be a major issue for them because they have an agreement with Portland International Airport that prevents them from flying over the River where they could interfere with aircraft using PDX. Thus, they don't fly over or near the I-5 Bridge. --While the public discussions of the panel's alternatives were going on, the CRC asked the FTA and FHWA if the CRC's change to a curved deck truss would require a

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P-101-011

Many basic bridge concepts (low, medium and high) as well as tunnels, were considered in the early alternatives analysis prior to the DEIS. A medium level, fixed span bridge emerged as the best choice for meeting the purpose and need and minimizing impacts and costs, and that was carried forward into the DEIS, as discussed in Chapter 2 of the FEIS. The DEIS did not define a specific bridge type; it evaluated bridge-related impacts based on a definition of vertical clearances above and below it, horizontal alignment, capacity, and a pier configuration concept. This allowed for multiple types of bridges, including the open web box that emerged through the UDAG group sessions and the composite deck truss that eventually became the preferred type following the Bridge Expert Review Panel (BERP) proceedings and the decisions by both governors.

FHWA and FTA were fully aware of the BERP activities and report. An FHWA engineer was among the members of the BERP. The straight alignments were straight across most of the water but had curves at either end to reconnect with the I-5 alignment. While the straight alignments were originally believed to have potentially lower costs and possibly fewer piers, it was clear after further analysis that this would not be the case. The straight alignment would not be expected to reduce costs or environmental impacts. The BERP report recommended that the project adopt any one of three bridge types. One of those types (composite deck truss) was selected, with a curved alignment across the river. This bridge type was selected because it met the purpose and need, would have lower environmental impacts, and would likely be lower cost and carry less risk than the other bridge types recommended by the BERP.

See the discussion of the Bridge Review Panel, evaluation of bridge types and final bridge type recommendation on pages 2-80 and 2-81 of the FEIS.

P-101-011

	Supplemental EIS. Their written submittal did not mention that there were other new bridge types being considered and that some of those alternatives might have less impact on key environmental resources. Comparing only the CRC's curved deck truss with the curved LPA, the Agencies concluded that the change in bridge type would not require a Supplemental EIS. The CRC then justified their selection based on their statement that it was the only option that would not require a Supplemental EIS. Of course, the Agencies did not receive information about the other alternatives so it was not appropriate for the CRC to conclude that they would all require Supplemental EIS's. Furthermore, the CRC did not ask the Agencies a more critical question----did the CRC's decision to use their own secret curved deck truss design without a full environmental comparison or public review of the panel's three alternatives meet NEPA requirements or did that decision require Supplemental EIS review? I believe the CRC erred and did not meet NEPA requirements for consideration of alternatives that may have fewer environmental impacts. <u>Recommendation:</u> Correct the FEIS or begin preparation of a Supplemental EIS to reconsider the bridge type decision after the ROD.

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Hines, Maurice

From: Mike Wentzel [ml-wentzel@comcast.net]
Sent: Monday, October 24, 2011 8:48 PM
To: Columbia River Crossing
Subject: The CRC project

P-102-001

I have said over and over again that the citizens of Vancouver should have the right to vote this boondoggle down. We don't want light rail, we don't need a replacement bridge that does nothing for transportation there still is congestion in the rose quarter and north of there. It does nothing except to help a few local commuters from Vancouver to Jantzen beach and back.

It doesn't take a rocket science to figure that one out. Please do the right thing stop this project before we waste the est. 10b dollars for the project.!!!!

Sent from Mike's iPhone

P-102-001

There will not be a public vote on construction of the various CRC project elements. However, as a public project, it must be approved and funded by the decisions of elected officials who are themselves directly elected by voters. Long-term operation and maintenance of the new light rail line will be funded through C-TRAN and TriMet. For its share of the operations and maintenance funding, C-TRAN plans on pursuing a public vote.

Hines, Maurice

From: Pressentin, Anne
Sent: Tuesday, October 25, 2011 5:18 PM
To: Columbia River Crossing; Wills, Heather
Cc: Chisholm, Derek; Harrison, Michael
Subject: Verbal comment from James Marsh

On Monday, Oct. 24, 2011, I received the following comment from James Marsh. I also spoke with him on Oct. 5, 2011. This is a summary of his comments.

Contact information:
James Marsh
2380 NW Hummingbird Drive
Corvallis, OR 97330
Phone: 541-738-0377
(No easy access to web.)

P-103-001 Mr. Marsh said the Hayden Island interchange was designed to provide instant gratification to people who want to get anywhere at 80 mph. He said people should be told to slow down and to reduce the speed limit to 40 mph or even install a stop light at the interchange. He said the current design is luxurious. CRC is trying to cram too much in too small a space. He said planners should "get real and tone it down." It's unfortunate that there are displacements, he said. When the Port of Portland property on West Hayden Island is developed there will be boatloads of trucks. He said a Hayden Island interchange may not be necessary.

P-103-002 Mr. Marsh's previous comments on Oct. 5 centered around the cost to date and called the $100 million expended a "double cross." He said don't build access to Hayden Island and that the Port should be responsible for providing access to West Hayden Island. He questioned the justification for a 450 wide interchange with 18 to 21 lanes that wipes out businesses. He said just put in light rail from Corvallis to Portland. It would be easier to maintain than high speed rail, he said.

Follow up:
Send project area map and fact sheets (completed on Oct. 6, 2011)
Confirm that he is on the project mailing list.

Let me know if you have questions.

Anne Pressentin | **Communications and Public Outreach**

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P-103-001

The design speed of the bridge is 60 mph transitioning to 70 mph slightly south of the bridge; the posted speed is expected to be 60 mph or less. A stop light on Interstate 5 would be inappropriate and unsafe. The proposed West Hayden Island development would not be expected to eliminate the need for a Hayden Island interchange.

P-103-002

By 2030, the region's population is expected to increase by one million people. This increase will result in more people needing to travel between home, work, school, recreation, etc. In 2005, 135,000 vehicles crossed the Columbia River on the Interstate Bridge, which led to 4-6 hours of congestion each weekday. By 2030, 184,000 vehicles are predicted to cross the river annually, which would lead to 15 hours of daily congestion if no action is taken. And while the project will encourage light rail ridership, light rain on its own will not meet the project's purpose and need.

Congestion occurs when vehicle demand is greater than a transportation system's capacity. It results in slower speeds and increased travel times. CRC defines congestion as vehicles traveling less than 30 mph. The Columbia River Crossing project uses information gathered from Metro's nationally-recognized travel demand models to determine the project's effect on congestion. These models predict trip frequency, types or modes of transportation, destination, and time of day. Transportation planners use these models to analyze the effects of such factors as increased population and employment, transportation improvements, and new developments on the transportation system.

Based on the Metro model's past ability to predict transportation effects, the CRC project is confident in the data received from Metro and uses it to determine what impact the project will have on congestion. The improvements proposed by the project to the highway and the

Hayden Island interchange will help better accommodate increased future vehicle traffic. New auxiliary lanes and longer on/off ramps will allow safer and more efficient merging and weaving when entering or exiting the freeway. Narrow lanes and shoulders will be widened to current standards. Shoulders will be added where they are currently missing. All of these changes will improve the flow of traffic in the bottleneck area of the Interstate Bridge.

Hines, Maurice

From:	Harbor Walter [walter@harbor-properties.com]
Sent:	Wednesday, October 26, 2011 8:36 AM
To:	Boyd, Nancy; Strickler, Kris; McCaig, Patricia; Garrett, Matt; Hammond, Paula; McFarlane, Neil; Hewitt, Henry; Horenstein, Steve; Oldfield, Meghan; Liles, Casey; Witter, Steven; Wagner, Don
Subject:	CRC - Portland Impacted Neighborhoods FEIS Comments
Attachments:	CRC-Portland Impacted Neighborhoods FEIS Comments.pdf; ATT14091882.htm

Message from the Portland Neighborhoods to the Leader of our Region about the CRC

To: Ginny Burdick <sen.ginnyburdick@state.or.us>, Tobias Read <rep.tobiasread@state.or.us>, Matt Wand <rep.mattwand@state.or.us>, Chuck Thomsen <sen.chuckthomsen@state.or.us>, Nancy Nathanson <rep.nancynathanson@state.or.us>, Lew Fredrick <rep.lewfrederick@state.or.us>, Lee Beyer <sen.leebeyer@state.or.us>, Cliff Bentz <rep.cliffbentz@state.or.us>, Margaret Doherty <rep.margaretdoherty@state.or.us>, Katie Brewer <rep.katieeyrebrewer@state.or.us>, Frank Morse <sen.frankmorse@state.or.us>
Subject: CRC - Portland Impacted Neighborhoods FEIS Comments

To the Legislative Oversight Committee for the Columbia River Crossing Project

P-104-001

This is the set of FEIS comments from the Portland Neighborhoods *directly impacted* by the Columbia River Crossing.

If you only have a little time - please read the first page of this document.
It provides the overview of our comments.

For those who want to get into specific details -
please read of the letters from each of the neighborhood associations
and each of the citizens who have taken time and care to review and comment on the FEIS for the CRC.

Respectfully,

Submitted for the Citizens of Hayden Island, Bridgeton and East Columbia Neighborhoods
by Walter Valenta 503-880-0181

*** eSafe scanned this email for malicious content ***
*** IMPORTANT: Do not open attachments from unrecognized senders ***

P-104-001

Project staff have read and reviewed the entirety of every comment submitted on the FEIS, including the comments forwarded by Mr. Valenta. The comments forwarded by Mr. Valenta and the responses to them are included as their own individual items within this folder.

Jay McCaulley
1555 N Jantzen Avenue
Portland, OR 97217
(503) 735-9526
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October 24, 2010

RECEIVED
OCT 24 2011
Columbia River Crossing

Nancy Boyd
Director
Columbia River Crossing
700 Washington Street, Suite 300
Vancouver, WA 98660

RE: COMMENTS FOR THE PUBLIC RECORD REGARDING THE FEIS AND MARINA STUDY DOCUMENT

HAND DELIVERED

P-105-001

Preface: I submit these comments as a member of the Jantzen Beach Moorage, Inc. I live on "A" Row, directly in the alignment of the CRC project. Professionally I am a marine consultant specializing exclusively in local, state and federal policy regarding marine development. Additionally, my work has allowed me to serve in this capacity in jurisdictions throughout the states of Oregon and Washington.

Dear Director Boyd:

The marina study compiled by CRC staff does not really address many substantive issues in regard to the displacement of the floating homes in the vicinity nor the project sponsors responsibilities under the Uniform Real Estate Acquisition and Relocation Act of 1971; rather it is more of a "primer" on the permit process *"by private developers."* The study, specifically does not even attempt to address the legal issues required under the act, or Final Environmental Impact Statement requirements, let alone provide any sort of financial analysis needed for project budgetary planning as required by the Federal Highway Act. Additionally, the study does not address those subject "to temporary displacement," such as D and possibly C rows, as described in the EIS.

Rather than address acquisition and relocation under the act, this study appears to consider relocation only as it pertains to floating homes. In fact the author erroneously refers to the "Uniform Relocation Act" throughout the document. In the case of the Jantzen Beach Moorage, the floating home owners are also members of the homeowners association and as such are entitled to compensation for impact to

P-105-001

Mr. McCaulley has provided an assessment of the project's Marina Study, conducted to assess the likelihood of a new marina being developed in time to aid in the relocation of displaced floating homes. The main purpose of the Marina Study was to compile information and study issues related to the establishment of new marinas or additional slips by private developers. The project maintains that it is unlikely there would be significant development of additional marinas or floating home slips in the foreseeable future and especially in the 12 to 18 month window when the project is likely to displace the floating homes.

Although Mr. McCaulley has suggested that permitting for a new marina could take place within a single year, the project's estimation also included time for the preparation of the plans and studies required for permit applications, and have estimated that potentially four years would be needed for permitting, feasibility studies, financing, bidding and construction. Mr. McCauley's critique points out several items he believes are factual errors or errors of interpretation. The project acknowledges Mr. McCauley's authority on these matters and will make the factual corrections he suggests. However, the basic conclusion remains the same - it is unlikely that a developer would be able to design, develop, permit and construct a marina, even with the support of coordinated agencies, in time to provide slips for displaced floating homes.

The marina study was not intended to address compensation and relocation benefits provided for by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 U.S.C. 4601 et seq.) (Uniform Act).

As stated in the Final Environmental Impact Statement (FEIS), all property owners will be offered Just Compensation for any ownership interests in parcels acquired for the project; and displaced occupants of

P-105-001

their portion of the DSL leasehold interest and moorage infrastructure, including docks, pilings, common areas and upland.

Interestingly, this report was referred to in the FEIS at Chapter 3.81-82, but not included in FEIS list of study documents as an appendix to the FEIS, nor was the author listed in appendix H, list of preparers. Additionally, the study is not published on the CRC web-site

The stated purpose of the study was:

> *This memorandum compiles information regarding requirements and issues related to the establishment of new floating home marinas in the Portland area by private developers.*
>
> *"Marina development is totally a private entrepreneurial effort by individuals or corporations interested in developing a property for profit."*

Given this limited assumption, it is not surprising that they conclude in the FEIS Acquisition Section (Chapter 3) that:

> *"(T)he project is not pursing(sic) the construction of a new floating home marina."*

However, with this said, the report admits that it may not meet legal scrutiny as a result.

> *This memo does not address the legal issues related to the relocation of floating homes by the Columbia River Crossing project under the Uniform Relocation Act.*

This fundamental issue is troublesome in that the purpose of the FEIS and Environmental Justice process, as well as the Uniform Act are clearly required to vet such issues. In short, their role is not to look at this from the standpoint of a "*private entrepreneurial effort... for profit;*" their role is to fulfill their legal responsibilities and adhere to the regulations in favor of those impacted by this government project, under eminent domain, for valid public purposes.

It is also interesting to note that the alternative site analysis did not include any government owned property or actual study of integration of the displacements into existing moorages. In North Portland Harbor roughly half of the upland property is owned by the Port Of Portland or Metro (considering West Hayden Island and the area along Marine Drive). While I am not suggesting that looking at relocation to theses sites is something that the displaced homes or Janzen Beach Moorage would be interested in or would even consider to be desirable; I do believe that the study is incomplete because they were not considered and therefore does not fulfill the requirements for moving forward under the Congressional Acts mention above.

said parcels will be offered all relocation benefits for which they are entitled under the Uniform Act.

Floating homes will be treated as real property unless it is determined there are sufficient replacement sites to which the floating homes can be economically relocated. If a Relocation Study determines that sufficient replacement sites are not available, the floating homes will be purchased at fair market value and the occupants will be provided relocation assistance which may include payments, if necessary, to acquire decent, safe and sanitary replacement housing.

P-105-001

For example, during the late 1990's, the open space opposite JBMI on the mainland side (across Marine Drive from EXPO) was successfully leased by Metro (a project sponsor) to a private developer for development of a marina indicating that it could be, and certainly should be considered as a potential site. Additionally, the Port of Portland faced similar circumstances when they undertook their runway realignment project; specifically relocation or demolition of floating homes under eminent domain based on federal transportation regulations. This effort resulted in agreeing to build the Islands Moorage rather than opt for demolition. Based on the zoning of Port property on North Portland Harbor, there are no justifiable reasons for not considering relocation of the displaced floating homes to portions of their vacant land, especially as they are just now considering development options for significant areas on West Hayden Island.

For the purposes of this analysis I have followed the author's format. The italicized sections are taken directly from the study.

I. THE MARINA DEVELOPMENT PROCESS:

The study author stresses the difficulties of marine development. JBMI can attest to some of the difficulties obtaining permits based on our own construction projects over the recent past.

> *Marina development is totally a private entrepreneurial effort by individuals or corporations interested in developing a property for profit. There are no known incentives or subsidies for developing a floating home marina. Developer's primary interest is making a profit for their efforts; a profit from the sale or rental of developed slips significant enough to reward the principals in the development for the work and capital investment over a number of years before profits can be realized.*
>
> *The development process is complicated and subject to protracted delay as the many agencies consider the submitted development plans and environmental material. It is estimated it would take a minimum of four years to advance a project through permitting to completion when it is ready for occupancy.*

Having specialized in marine development permitting throughout my professional career, I believe I am in a position to say that the author has not considered many reasons for engaging in such a difficult task in both the public and private sectors; "*...totally a private entrepreneurial effort by individuals or corporations interested in developing a property for profit.*" Several moorages in the Portland area, including Jantzen Beach Moorage Inc. are owned by not-for-profit home owner associations, and further, many marinas in Oregon and Washington are publicly owned.

As described above, the Port of Portland found with their runway realignment project that building a new moorage suited their purposes based on feasibility and they constructed the Islands Moorage. While we do not disagree with the finding that marine development can be difficult and time consuming; as a consultant exclusively permitting

P-105-001

such projects in many jurisdictions; public marine projects, although subject to the same regulations as a private developer would face have several advantages when undertaking such.

While I can cite cases where private sector projects have taken as long as four years to permit and develop, in my experience this would be rather unusual depending on the jurisdiction. Most projects can be permitted in about one year. It would be highly unusual for a public project to take nearly that long, especially considering the significance and magnitude of the CRC project as the driving force. The author does not provide documentation as to the "estimated" minimum four years to advance a project of this nature. I will detail some of the expected time-lines for permitting in the next section.

In this case, the cause for displacement is based solely on a substantial "public need" of regional, interstate, and national significance that the permitting agencies certainly consider when evaluating an application, especially from a sister agency. Also in this case, the project has garnered the full political and professional support from the local project partners (local jurisdictions), Oregon and Washington States, the respective Departments of Transportation, including in-house professional staff from both agencies, as well as consulting teams from several disciplines, significant funding, and strong, well publicized support from both Governors.

If the scope of the study even considered the public nature of the project and the fact that the CRC project must adhere to the legal issues of eminent domain as a result, the study findings would properly be found to be significantly different than described. Certainly, building a freeway bridge over the Columbia River between Oregon and Washington, through several jurisdictions and layers of agency review, can not be less daunting of an undertaking, as this study implies, than permitting and construction of a moorage for those that will be displaced, or even considering, as required, by state and federal policy, alternative sites and proper analysis.

II. THE PERMITTING PROCESS:

One of the first steps in commencement of the permitting process would be a consultation with DSL and the Corps. DSL and the Corps have a joint permit application process. A pre-application meeting will be arranged with the applicant's consultants and agency technical staff, biologists and others to assist the applicant in determining the plans and reports that will be needed in considering the effects of the project and any limitations and requirements that may be needed for approval. The following are the primary players in the permitting process:

> *At statehood in 1859, the federal government gave Oregon the ownership of submerged and submersible land underlying navigable waterways... The State Land Board is charged with managing this land on behalf of all Oregonians. The Department of State Lands (DSL), the Land*

P-105-001

Board's administrative arm, is responsible for the day-to-day management of these publicly owned resources.

Application for DSL leases: *Any new use of submerged lands under DSL jurisdiction requires a lease. The DSL's application requires an application form accompanied by detailed maps and plans for the proposed facility. DSL staff distributes the application and the plans to a mailing list which includes nearby owners, municipal jurisdictions, and resource agencies. DSL staff receives comments on the proposed project and refers any objections it deems substantive to the applicant for resolution. It is up to the applicant to resolve issues raised in the comment period. If the applicant is unable to resolve issues deemed substantive by DSL, it may not be approved.*

In addition to the recipients listed above several private individuals and organizations are included on DSL's mailing list, specifically tribes and environmental groups who routinely weigh-in on project proposals. DSL weighs the nature of the comments, as well as who is making the comments prior to moving forward with their decision to issue a lease or not. For example, comments from the Oregon Department of Fish and Wildlife tend to carry more weight than comments from certain organizations that appear to oppose every project as a matter of routine. DSL exercises significant discretion when considering each comment. While they indeed may not issue a lease based on a comment, they are typically not obligated to resolve or condition approval in every case, nor is the applicant.

The proceeds from the Waterway Leasing Program inure to the Common School Trust Fund for distribution to school districts throughout the state. With this in mind, DSL weighs the principles of "sound management" of the natural resources of the State, as well as their contribution to schools when making their decision as to issuance or not. Given these circumstance, leases are generally issued unless the project plan is found to be significantly flawed or detrimental to our environmental policies. Most planning consultants in the public and private sectors are well versed in what will work and what will not work when designing a project for DSL scrutiny. In short is relatively rare for DSL to simply deny a lease authorization as implied.

Once an application is deemed complete, usually within 30 days, the DSL puts the application out for the 30 day comment period. DSL at that time can issue a lease or provide conditions for approval or deny the application. Typically a lease is issued in 4 to 6 months.

Leasing Procedures: *All moorages, marinas and docks in this area are subject to DSL administrative rules and must be leased from DSL. DSL will not approve a lease until it is satisfied that all applicable rules and permits have been issued. A commercial marina may select one of three ways of determining their annual rent:*

P-105-001 Interestingly, not all moorage projects require a DSL lease as stated and quite specifically in the North Portland Harbor area. At the time of statehood, the "Oregon Slough" as it was known then did not go all the way through in many water conditions. An act of Congress in 1912 authorized the Corps of Engineers to dredge a commercial channel so the entire length of Hayden Island could be utilized for marine transportation. Therefore, much of the east end of the Hayden Island channel bed is fee title property, not subject to DSL lease; rather it is owned by the riparian owners along the shoreline and along Bridgeton Road.

Area "D" described later in the CRC study as *"the most likely site on the river for development of a new marina"* is one of these properties not subject to DSL lease.

There are also categorical exemptions pursuant to DSL Waterway Leasing Administrative Rules such as private wharves and certain government facilities.

As mentioned above, the reviewing agencies including DSL, naturally tend to consider projects presented to them by another government agency with some degree of deference; in addition ODOT has full time professional staff assigned to liaise exclusively with DSL on ODOT projects (I applied for the position at the time it was first offered). Based on my experience, I could not anticipate a situation where DSL would deny authorization to ODOT for construction of a floating home moorage to replace those displaced by the CRC project. Further DSL reports directly to the Land Board, made up by the Governor, Secretary of State and State Treasurer; all of whom have announced publicly, strong support for the CRC project. I can not imagine a scenario where DSL staff would consider "bucking' the Land Board by denying a lease to the CRC should the project determine that a replacement moorage was an alternative to displacement.... It would probably be approved in record time.

> ***B. Corps of Engineers:*** *The DSL application is a joint application with the Corps, which is responsible for permitting construction and dredging in public waterways, such as the Columbia River. It is the Corps' responsibility to:*
>
> > *evaluate permit applications for proposed activities in waters of the United States (including wetlands) throughout Oregon, under the authorities of the Marine Protection, Research and Sanctuaries Act, Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.*
>
> *In evaluating an application, the Corps requests a biological opinion (BO) from the National Marine Fisheries Service (NMFS). The BO contains an assessment of the potential impact of the construction and operation of an in-water facility to fish species and to critical fish habitat. If it is determined that the project impacts are acceptable, the BO will contain terms and conditions that are deemed necessary to minimize the potential harm to protected species. These conditions can include restrictions on in-water work, specific construction techniques and construction materials. NMFS requires that the*

P-105-001

Corps include these restrictions in their permits and that the project be monitored to assure the permittee complies.

A review of NMFS biological opinions (BO) over the last nine years for the Columbia and Willamette River systems, for Oregon and Washington shows there have not been any opinions issued on floating home marinas. So it is difficult to judge current agency opinion. However, BO's for other in-water installations, such as boat docks, highlight agency concern regarding over-water shading. Below are excerpts from a relatively recent BO.

> *Light plays an important role in defense from predation. Prey species are better able to see predators under high light intensity, thus providing the prey species with an advantage...*
>
> *An effect of over-water structures is the creation of a light/dark interface that allows ambush predators to remain in a darkened area (barely visible to prey) and watch for prey to swim by against a bright background (high visibility). Prey species moving around the structure are unable to see predators in the dark area under the structure and are more susceptible to predation. The incorporation of grating into all of the docks allows for more light penetration and diffuses the light/dark interface. This will minimize the susceptibility of juvenile salmonids to piscivorous predation resulting from this project.*

Shading is a permanent effect that could not be readily mitigated for a floating home marina. A minimum size floating home marina of about 40 homes would create about an acre of shade. Unlike other overwater features, it would not be possible to add transparent or translucent features to a house that would alleviate shading. Floating docks can utilize metal grating and boat houses can have translucent roof panels and doors to transmit light, but floating homes do not have the same opportunities. There is no certainty how NMFS would consider the issue, and whether there could be acceptable mitigation. Conversations with marina developers indicate the shading issue is known to developers and creates investment uncertainty, a significant issue.

Over the past few years the Corps of Engineers review process has probably become the most time consuming aspect of permitting, to a large degree because of the required consultation with Nation Marine Fisheries.

Contrary to the author's assertion however, and contradicted by his own foot notes and comments, several biological opinions have been conducted for floating home moorages in the past 9 years; some very recently and some in the immediate area of North Portland Harbor. For example, his foot note on page 3 of the report.

P-105-001

5 NMFS Biological Opinion for Hayden Island Marina. 2004. https://pcts.nmfs.noaa.gov/pls/pctspub/sxn7.pcts_upload.download?p_file=F31284/ 200300787_Hayden_Island_final_1-23-2004.pdf. Page 10-11. Retrieved 1/31/2011.

The Rocky Point Marina expansion approved earlier this year and mentioned on page 5 of the report, required consultation and a biological opinion, as did the reconstruction of the Jantzen Beach Moorage, to name a few. Even modest modifications to existing structures can cause a need for such consultations; as such, these considerations are a routine component of every marine project.

With this said however, NMFS has several avenues to pursue regarding mitigation and minimizing impacts, typically included in the conditions of approval. Light penetration is only one consideration of many that we integrate into every project proposal. Mitigation also comes in many appropriate forms depending on the nature of the impact.

Acceptable forms of mitigation used in circumstances such as described when an impact can not be avoided is on-sit or off-sit habitat creation and enhancement, payment in-lieu of mitigation, as well as other conditions of approval NMFS deems appropriate.

> *Shading is a permanent effect that could not be readily mitigated for a floating home marina... ...There is no certainty how NMFS would consider the issue, and whether there could be acceptable mitigation.*

While every project consultation is analyzed on its own merits, NMFS is quite knowledgeable in minimizing impacts and has made no secret of what they expect and methods to limit impacts to acceptable levels. They have published dozens of BO's, as well as study and guidance documents providing industry professionals with appropriate methods for project design and engineering to minimize, mitigate or avoid adverse impacts. The author is simply wrong when he says "(t)*here is no certainty how NMFS would consider the issue, and whether there could be acceptable mitigation.*"

Further, in my experience NMFS also considers existing structures differently than new construction and reconstruction, again depending on the nature of the impact. For example, a recent client wanted to install a new dock in a location that did not have a dock; he purchased an existing concrete dock section that could not effectively be retro-fitted with light penetrating panels for installation at the new site (specifically in an are deemed to be essential habitat, an even higher hurdle, unlike this portion of the Columbia River and North Portland Harbor). NMFS found that because it was an existing structure, and that there would be no net increase in surface area or shading, the impact was "de minimis" and no further mitigations was required.

P-105-001

In this particular case (CRC), the displaced floating homes and moorage infrastructure already exist. Whether relocated, rebuilt or reconfigured, the net surface area impacted would not change appreciably, if at all. While consultation and BI-OP would still be required; a new, relocated or reconfigured moorage is without a doubt more feasible than indicated by the study.

These considerations are at the very heart of the FEIS and NEPA process. CRC project staff are certainly well aware of these issues and nuances in-that the bridge project faces exactly the same considerations, however on a much larger scale and significantly greater impact. As such, I believe the FEIS fails to meet the minimum threshold for moving forward toward acceptance based on the Uniform Real Estate Acquisition and Relocation Act.

III. ZONING

Zoning is an important factor in determining the feasibility of a potential floating home marina development. There are four jurisdictions on the Columbia which determine allowable land use: the City of Portland, Multnomah County, the City of Gresham, and the City of Fairview. The City of Portland has jurisdiction upstream from the mouth of the Willamette River, past Hayden Island to about 185th Drive.
Upstream from that point there is approx. one mile of Columbia River frontage in the City limits of Gresham. The next 1.5 miles is in the City of Fairview, and the final stretch, to a point near the Sandy River, lies within Multnomah County. The Columbia River downstream from the mouth of the Willamette, as well as the Multnomah Channel, are in Multnomah County jurisdiction.

A. City of Portland:

All of the North Portland Harbor and most of the existing marinas are within the City limits. Except for a few small areas, Portland's zoning along the Columbia River frontage is industrial and commercial. The commercial zone is along Hayden Island, on the north side of North Portland Harbor. The industrial zone extends along the south bank of the Columbia from the mouth of the Willamette upstream to the city limits, approximately at 185th Drive. In addition, there are three overlay zones that restrict uses along the Columbia River, a conservation overlay and two airport related overlays. Those portions of the riverfront that are in public ownership are zoned for open space.

Several of these statements are in error. The northwestern half of North Portland Harbor is not within the City of Portland city limits, the entire western half of Hayden Island is within the jurisdiction of Multnomah County and zoned MUA-20, not industrial or commercial or open space as stated. MUA-20 zoning specifically lists floating home moorages as a conditional use. On Portland maps the Port of Portland property is listed as residential-farming.

P-105-001

Significantly, none of the North Portland Harbor riverfront property "in public ownership" is zoned for open space except one very small park west of I-5 on Hayden Island (Lotus Isle), adjacent to a house boat moorage. In fact, the park is the riparian upland lot. Further, the park's shoreline walkway bisects the entrance to the moorage from the upland parking area for the moorage.

> ***Floating Structures in the Zoning Code**: The City of Portland Zoning Code, Chapter 33.236, Floating Structures, addresses the requirements for floating homes and marinas. "This chapter adapts the existing upland regulations for use with floating structures." This chapter specifies that "All uses in floating structures must be an allowed use on the upland lot they are attached to and must comply with all use regulations applying to the upland lot." Also, a houseboat moorage is considered a multi-dwelling use, so a houseboat moorage would only be allowed where multi-family is permitted.*
>
> ***Summary of Applicable Zoning Codes:***
> ***CGhcx**. This general commercial code allows houseboat moorages as a permitted use.*
>
> ***IG**. This industrial general zone also allows multi-dwelling uses, which includes houseboat moorages.*

The study is a bit misleading in that the zoning regulations in the area in question are not limited to multi-dwelling use zones only. Plainly put; floating home moorages are allowed in all of the zones in question. While "house boat moorages" are indeed considered a multi-dwelling use, they are also designated as a commercial uses and allowed in the IG2 zone as well.

> ***c = Environmental Conservation zone**. For proposed developments that do not meet all standards for this zone, an environmental review is required and a mitigation plan must be submitted which shows that "all significant detrimental impacts on resources and functional values will be compensated for." The mitigation plan must also demonstrate there is a public need for the proposed use or development.*

Almost by definition; the cause for displacement of the floating homes is based solely on a substantial "public need" of regional, interstate, and national significance. As one of the local partner jurisdictions, the City of Portland understands the significance of this project and that public need.

With this said the "c" zone review is not an impediment to development of a floating home moorage, rather it is a guideline used throughout the design and engineering process to assure compliance and responsible development. All considerations of the code section can be met and/or "*all significant detrimental impacts on resources and functional values will be compensated for.*"

P-105-001

*h = **Aircraft Landing zone**. This zone limits construction height to avoid conflicts with the nearby Portland Airport. However, floating homes are well below the effects of any height restriction and would not be affected by this zone.*

This is not an issue.

*x = **PDX Noise zone**. The x overlay designates the PDX Noise zone. It designates areas where new residential construction is prohibited due to high noise levels and other areas that permit residential construction but require additional noise insulation in new and reconstructed residences. The Ldn 65 dBA noise contour (decibels), as shown in the 1990 Portland International Airport Noise Abatement Plan Update is the boundary for the PDX Noise zone. All land within that noise contour, including lands within a higher contour, is in the PDX Noise zone. All new structures must be constructed with sound insulation or other means to achieve a day/night average interior noise level of 45 dBA. New residential uses are prohibited within the Ldn 68 or higher noise contour.*

The noise zone overlay is not an issue that would preclude floating home development in the immediate area of North Portland Harbor or alternative sites being considered. The Ldn 68 contour prohibition areas do not overlap any of the potential site alternatives. All of the alternative sites being considered can be mitigated for noise by utilizing proper construction methods and materials.

This is a non-issue in regard to permitting.

B. ***Multnomah County Zoning:***
Along the Multnomah Channel there are areas of undeveloped waterfront with abundant upland area. However, it may be difficult to create additional marinas in these areas based on zoning. The north bank of the Multnomah Channel, Sauvie Island, is zoned exclusive farm use (EFU) which does not allow non-agricultural development. New or expanded marinas would not be allowed. The south bank is zoned for multiple use agriculture (MUA-20). This zoning is intended to allow agricultural lands not suited for commercial farming to be put to compatible uses such as low density residential, forestry, and other uses compatible with the natural resource base. Houseboats and houseboat moorages are a conditional use in this zone.

During the mid and late 1990's, representing the Waterfront Owners and Operators Organization, I actively participated in the Sauvie Island/Multnomah Channel Rural Area Plan rule promulgation, the ordinance was adopted in 1997.

The Multnomah County Comprehensive Plan Framework (Policy 26- Sauvie Island/Multnomah Channel Rural Area Plan) actually designates the MUA 20 zone as

P-105-001

the appropriate zoning area for floating homes and moorages within this plan and specifically includes the following areas as the appropriate sites for such.

Following is the actual verbiage of Multnomah Policy 26:

The following areas are designated as suitable for houseboats:

1. Multnomah Channel (west side).
    a. From Rocky Point Moorage, or from an area 1650 feet north of the southern boundary of Section 36, T3N, R2W, known as Rocky Point, north to the Columbia County boundary.
    b. From the City of Portland corporate limits north to 1/2 mile north of the Sauvie Island Bridge.
    c. Area occupied by Happy Rock Moorage, Sauvie Island Moorage, Parker Moorage, and Mayfair Moorage.
    (Added by Policy 10, No. 2, "Sauvie Island/Multnomah Channel Rural Area Plan," Adopted October 30, 1997, Ordinance No. 887).
2. Oregon Slough.
    a. the south shore of Tomahawk Island.
    b. any other areas identified as suitable for houseboats by the Hayden Island Plan.
3. Columbia River (near 185th Avenue).
    a. From the northwest corner, George B. Pullen D.L.C., To the northeast corner, Pullen D.L.C.

Houseboats and moorages existing outside these areas shall be limited to existing sites and levels of development.

No houseboats shall be located on the Columbia River east of the Sandy River, or in violation of Federal Aviation Administration Clear Zone Standards, or in violation of any other applicable federal, state or local standards.

Please note: The Official name of the North Portland Harbor is "the Oregon Slough." Although the City of Portland had already annexed the eastern half of Hayden Island, the western half is still in the jurisdiction Multnomah County planning and zoned MUA 20; appropriate for house boat development. The south shore of Tomahawk Island is the location of one of the sites mentioned in this study; the property in question is in fee title (not subject to DSL lease) and properly zoned for a floating home moorage. Similarly, the Hayden Island plan allows moorages in all other zones bordering the North Portland Harbor.

P-105-001

> *All of the Multnomah Channel is subject to the Willamette River Greenway (WRG) overlay. This overlay is designed to protect the natural qualities of the waterway. It does not directly prohibit developments such as marinas. However, the WRG overlay emphasizes preservation of vegetation, wetlands, and flood plains in their natural state which could make development of upland improvements, e.g. parking or septic, to support a new marina difficult.*

The author's concerns regarding the WRG overlay are overstated in-that flood plain improvements, including parking and septic are routine design and engineering features that are necessary considerations for every marine development project.

> *Additionally, all of the Multnomah Channel is rurally zoned and outside the urban growth boundary (see Multnomah County Base Zoning Designations - West Hills and Sauvie Island Rural Plan Areas). Construction of a new marina outside the UGB would require an exception to its urban growth boundary and is subject to review by the State Department of Land Conservation and Development.*

Simply put; marina development is not precluded by the Urban Growth Boundary as this study states. The Multnomah County Comp plan and Chapter 34 ordinance have already been scrutinized and accepted by DSCL; they remain in force. Goal exceptions are not required under these circumstances.

> *In order to deal with the many floating home marinas along the Multnomah Channel, the County inventoried the marinas to determine the number of floating homes, boat houses, boat slips and other uses for each marina. The inventory was conducted in mid-1995 and was subsequently adopted by the County to establish the number of grandfathered units allowed for each existing marina. A recent Multnomah County staff report on a request to add 23 floating home slips to the existing Rocky Pointe Marina recommended to deny additional floating home moorages beyond those previously grandfathered.*

The underlined portion of the study document is simply not true.

During the period the regulations were being promulgated, my testimony lead directly to the inventory described above as well as inventories by DSL on a statewide basis. The inventory was actually conducted in 1997 and 1998.

The author simply misinterprets the purpose and significance of the inventory. While the inventory was used to "grandfather" certain moorages as non-conforming uses; these were developments and structures, many of which had bee built with incomplete permitting or constructed before moorages were regulated the way they are now; the underlying purpose was simply to get a baseline for future development limitations and moorage expansions. As an example; the City of Portland was the first

P-105-001

jurisdiction in the state to create a "Floating Structure Code" (Title 28-implemented November 1991), prior to this, normal building codes did not apply.

Also part of the County rule changes was creation of a "Special Plan Area" to allowing existing moorages and new moorages with appropriate zoning a method to increase density beyond the standard density of 1 floating home for every 50 feet of water frontage; not to preclude expansion. Interestingly, although the "SPA" enabling legislation passed into law, the Multnomah County Planning Department, has not established rules for implementation. This is simply a density issue, not a preclusion for expansion.

In regard to the Rocky Point Marina expansion; while staff recommended denial of the SPA, they did recommend houseboat expansion to the standard density:

> Staff recommends the Planning Commission **deny** the request to establish a Special Plan Area because, as outlined in this report, the applicant has failed to establish that the project conforms to the approval criteria outlined in Policy 15 of the County's Sauvie Island/Multnomah Channel Rural Area Plan, nor have they shown that there is a public need, which is required in order for a zone change to be approved (MCC 37.0705(B)(2)). If the Planning Commission accepts the staff recommendation, the applicant would potentially be able to expand the houseboat moorage at a density of not more than 1 unit for every 50 feet of frontage provided they obtain the required land use permits. This would allow up to 23 new floating homes.

This expansion was approved by the Planning Commission as well as the County Board of Commissioners in 2010.

This section of the study document is particularly troublesome in that the study not only draws an erroneous conclusion, based on misinterpretation of the regulations and purpose of the inventory; it is blatantly untrue.

> ***IV. AVAILABILITY OF FLOATING HOME SLIPS***
> *An important consideration in the need for additional floating home marinas is the availability of vacant slips. The following numbers are based on a count from Google Earth aerial photos. The photos are recent, one to three years old, and represent a good estimate of the availability of vacant slips.*
> - *There are approximately 12 potentially available vacant slips in the North Portland Harbor out of approximately 610 floating homes, which is a vacancy of only 2%. These slips may not all available on the real estate market. Some may be held for future development.*
> - *There are approximately 25 vacant slips in Gresham area marinas, McGuire Pt. to Big Eddy.*
> - *There are approximately 12 vacant slips in Multnomah channel marinas up to Scappoose.*

P-105-001

This section of the study does not adequately address the availability of slips by any standard. Supposed vacant areas do not equate to "available slips" and applying a ratio of vacancies base on non-empirical data carries no weight or value. Using Google Earth does not adequately depict the actual use or availably of a site and certainly can not consider issues such as proximity to the federally established ship channel, zoning densities, zoning restrictions, etc. It must be rejected in its entirety.

Based on my experience and knowledge, I do not believe there are currently 12 available slips in the North Portland Harbor. If there are, I would certainly like to know where they are.

> ***V. SITE AVAILABILITY FOR NEW FLOATING HOME MARINAS***
> *The initial focus for this memo was in the vicinity of the North Portland Harbor, however, because of the shortage of sites in this area, the search was extended upstream to Troutdale, and downstream to the Multnomah Channel at Sauvie Island.*
>
> ***North Portland Harbor West of I-5***
> *West of I-5, there is little opportunity for additional marina development. The area between the railroad bridge and Brown's Marina has very little upland area and is mostly owned by the Port of Portland. On the Hayden Island side, between the railroad bridge and West Hayden Marina there is a potential site, area A. The upland area is already developed with a commercial use, however, it might be feasible to redevelop a portion of the parcel to provide upland facilities for floating home marina use.*

I do not believe the Port of Portland property can or should be excluded by a study of potential sites; either on a willing seller basis or by eminent domain. As one of the proponents and most significant benefactors of the CRC project in regard to increased transportation capabilities it could be in their best interest. With this said however, the study is remiss in that the question was not asked nor were the possibilities explored or even considered.

The site mentioned is a small but potential site on a willing seller basis or by eminent domain. West Hayden Island Moorage was previously purchased, permitted and constructed on a portion of this site.

> *Another potential site is the area between the RR bridge and Class Harbor Marina, which is privately owned, area B. It is zoned industrial and marinas are an allowed use. It appears to have adequate upland area. One problem is that it is directly downstream from the swing span of the railroad bridge, so river traffic would be very close to the marina. There is no information showing a restriction on development at this site, but such use might be restricted for safety purposes. There is also a small parcel between Class Harbor and Suttle Road marina that might be filled in with eight to ten homes.*

P-105-001

These may be potential sites, however the upland sites would require additional study to ascertain if indeed the areas can provide adequate ingress and egress (Marine Drive is a commercial route of significance to the state with limitations on driveway inclusions) and parking. The portion adjacent to the railroad bridge is probably too close to the federally established commercial ship channel (that includes a 75 foot buffer) to be considered.

The rest of the river frontage west of the RR bridge on Hayden Island, and downstream from Suttle Road Marina is owned by the Port of Portland and is unavailable for marina development.

Addressed above.

North Portland Harbor East of I-5

Area C is approximately 1,400 feet of shoreline, along the south bank of the North Portland Harbor between Pier 99 Marina and Blue Frog Landing. Zoned general commercial, this area allows floating home marinas and is within the urban growth boundary. It could be a prime location for future marina expansion. However, the upland areas are being developed for interchange commercial uses. Two of the upland properties have been recently developed with motels. The center parcel may be developed in a similar fashion. If this parcel is developed there will be no upland area to support a new marina.

It is my understanding that the owner of this parcel is considering a moorage in anticipation of the CRC project. However, there are significant difficulties developing this site for a floating home moorage. The vacant upland between Pier 99 and Blue Frog Landing, although in fee title, is the flood control dike with specific limits on development and use. Further, the upland areas on both ends of the undeveloped dike may not support the necessary parking and would probably be precluded by the City of Portland regulations that require floating homes to be within 500 feet of the parking area for fire safety and other considerations.

Another open area that might accommodate additional floating homes would be across the channel from Blue Frog Marina. However, all the adjacent upland has already been developed with homes and a public park. There is no room for parking or other facilities necessary for a new marina. As with area C, a floating home marina is not feasible without adequate upland area.

This area is not a potential site. In addition to the reasons cited; it is the location of the original trolley bridge to Hayden Island, it is extremely shallow (above water level in most conditions due to additional silting), its proximity to the park and no available riparian property rights.

East End of North Portland Harbor

P-105-001

Area D is on Hayden Island east of existing moorages. It has appropriate zoning, readily available utility connections and is within the UGB. This is the most likely site on the river for development of a new marina. It is owned by Columbia Crossings, and has been planned for marina expansion for a long time.

This site is a very likely alternative site. During the early and mid-1990's I was involved in the early planning and permitting of this site. While the permitting was successful, for business reasons un-related to feasibility the project was abandoned. The bed of the channel is in fee title, no DSL lease would be required. And because it was previously permitted it can be presumed that it could be permitable again.

This site can and should be considered on a willing seller or eminent domain basis.

Area E, the south side of channel, east of Portland Yacht Club, is a row of single family residences that could be redeveloped to marina use. The zoning is single family residential, so a marina would be a conditional use. However, homes would need to be demolished. Adequate upland and utilities would be available. Perhaps a ¼ mile of river front could be developed. Beyond that, development would be prohibited by the airport noise overlay.

This would be one of the least developable potential moorage sites mentioned in the study for the reasons given as well as practical considerations because of its exposure to wind and wave conditions.

VI. REDEVELOPMENT AND IN-FILL OF EXISTING MARINAS:
Of all the area reviewed, only these six sites were identified as having a likelihood of development. If there is a demand for additional spaces, new sites could also be created through either the expansion of an existing marina or the conversion of an existing boat marina to floating homes. However, both of these options likely present almost as many challenges as establishing a new marina.

The conversion of a boat marina to floating homes has a number of hurdles. Boat marinas have different designs, dolphin spacing, and utilities than what is needed for boat moorages. Such a retrofit would be expensive and require most of the regulatory permits necessary for a new marina: DSL review for change in use; Corps of Engineers for in-water construction; NMFS for in-water construction and use change; and, zoning and building permits. Investigation and permitting for conversion could take nearly as long as a new marina and eventual approval may not be any more certain.

For myriad reasons mentioned above and throughout my response these conclusion are not supported by the evidence. Expanding or reconfiguring an existing moorage is significantly easier and less time consuming that new construction in every jurisdiction.

P-105-001

In fairness to the author, he simply lacks the specific expertise in this extremely narrow field and complex technical arena; marine development, to make such statements, especially when considering the public nature and significant public need represented by the CRC project.

Remarkably, the statement *If there is a demand for additional spaces"* is particularly revealing. Foremost, while there has clearly been a pent-up demand for slips throughout the area, the bridge project itself is creating additional demand.

> *A good example is the Rocky Pointe marina on the Multnomah Channel. It is in the process of review for an in-fill of twenty three floating home slips as well as additional boat slips. The County Staff recommendation is to approve the expansion of boat slips but to deny additional floating home moorages beyond those previously grandfathered. This demonstrates it may be unlikely to obtain additional floating home slips in the Multnomah Channel beyond the number grandfathered in the mid-1995 survey.*

Not only is this not true as demonstrated above; they did obtain the permits for expansion, and as a matter of public record was approve prior to the completion of this study.

> *The greatest problem with conversion is that economics may not support converting pleasure boat slips to floating homes slips. Marina operators indicate that boat slip rentals are possibly more profitable than floating home moorages, especially in the current market. There is still a reasonably good demand for large boat slips.*

This statement is not supported on any factual basis, nor is it supported by any sort of marketing study. While there has been a relatively steady flow of floating home sales, even during the downturn in the economy; absent as much discretionary income, the boat business has been rather decimated in many areas geographically and by boat class; typical of the historic economic trends. Larger boats have always seemed to fare better in hard economic times.

One exception to the "flow" of sales for floating homes in the immediate vicinity; the CRC project seems to have cast a dark cloud over purchasing floating homes within the impact area, many of which have been on the market for quite some time.

With this said however, this has no relevance to the FEIS or the CRC project.

> ***VII. INVESTOR EXPECTATION***
> *Discussions with real estate professionals indicate that there is a general feeling in the development community that it is virtually impossible to develop a new marina through the process of environmental and building code requirements. An effort of four years or more, plus an investment of hundreds*

P-105-001

> *of thousands of dollars for development plans and environmental studies may be necessary before knowing whether a project is viable. This uncertainty makes it difficult to obtain financial backing for such a speculative venture.*

Again the relevance of "investor expectation" in this very public project and process is suspect at best, and does not fulfill the basic process questions of NEPA, the FEIS, Environmental Justice Act, Federal Highway Act nor the Uniform Real Estate Acquisition and Relocation Act of 1971.

As demonstrated throughout my analysis of this study it is simply not "virtually impossible" to develop a new marina in the private sector and certainly not true for the public sector either, especially given the significance of the CRC project.

I must submit that the study may have interviewed the wrong professionals; real estate professional are typically not as well versed in the intricacies of marine development as those involve directly in permitting such complex projects.

> *The ultimate proof of the difficulty of developing a floating home marina is recent market activity. There have been no new marinas constructed in the past decade, on either the Willamette or Columbia rivers in Oregon. The last new marina was McGuire Point, which was completed approximately twelve years ago.*
>
> *The Columbia Ridge marina still has unsold slips after seven years. Most floating home developments are recreational properties and many are owned as second or weekend homes. Since no new marinas were started in the overheated real estate market prior to 2009, it seems unlikely that there would be activity by private investors in the current market for the foreseeable future. Recreational properties have been the hardest hit in the current real estate market.*

Columbia Ridge indeed has unsold slips; rather than for the conclusions and assumptions offered by this study, an underlying this reasons for this is that the developer appears to have over-priced the slips and has some rather difficult criteria for occupancy.

While I do not disagree with the author that marine development is not difficult; the *"ultimate proof ... There have been no new marinas constructed in the past decade, on either the Willamette or Columbia rivers in Oregon."* remains unsubstantiated and is simply not true.

In addition to the recent and current projects mention above, Pier 99 and Rocky Pointe, and Reflection Bay (the previously permitted project on Hayden Island owned by Columbia Crossing (Area D); Mr. Casselman (who previously permitted and built 3 moorages on Multnomah Channel) has expressed interest in constructing a new moorage on his last remaining vacant property on the channel, specifically in response

P-105-001

to the CRC project; Mr. Hamer (developer of Riversbend Moorage on Multnomah Channel) has express interest in expanding his existing moorage.

And finally, a project I am working on has recently submitted applications for development and expansion of a moorage on Multnomah Channel.

> ***VIII. CONCLUSION:***
> *It is very unlikely there will be a new private floating home marina development in the foreseeable future. Zoning and permitting requirements restrict prospective available sites and make it difficult to determine if a new marina would be allowed on any potentially developable sites. Proof of this conclusion is that no new marinas were constructed during the peak of the real estate market a few years ago, so it is very unlikely one would be started in the current market. In-fills and marina conversions could provide additional slips in the North Portland Harbor area, but such development could be time consuming and expensive and may not be permitted by regulatory agencies.*

This conclusion is mistaken, remains unsubstantiated and is simply not true, and in fact there are other areas within the City of Portland that could feasibly be developed for floating home moorages.
Pursuant to the FEIS at 3.81-82:

> ***North Portland Harbor, Portland, Oregon***
> *The LPA would require the displacement of floating homes in the North Portland Harbor. Information regarding floating home availability in the North Portland Harbor is not provided in the reports that informed the above discussion, although some information can be gleaned from the Regional Multiple Listing Service (RMLS) searchable database. A search of the active listings in April 2011 showed approximately 109 housing units listed for sale in Hayden Island, North Portland Harbor, and North Portland. Of that number, 40 were floating homes, 38 were condos, and 31 were conventional homes. The above numbers do not include private listings.*
>
> *In the course of conversations with potentially affected property owners, CRC staff received inquiries about the potential for constructing a new marina to accommodate displaced floating homes. To better understand new marina permitting and construction, the project conducted research on the development of marinas. This research found that there are some likely challenges to developing a new floating home marina, including: permitting through local jurisdictions and environmental resource agencies, acquisition of property, and eventual sale or lease of marina slips (CRC 2011). The project is not pursing the construction of a new floating home marina.*

Although floating homes and floating home moorages are a rather unique form of housing choices creating a significant difficulty comparing them to normal terrestrial based housing choices (or those who choose live on dirt as I like to say), as well as

P-105-001

limits to the Uniform Real Estate Acquisition and Relocation Act requiring geographic, economic and socially equivalent housing. Simply dismissing this uniqueness is not adequate under the act, nor is simply finding "that the replacement units are decent, safe, and sanitary, and in areas that are at least as desirable as the individual's current neighborhood."

Neither is simply checking the *Multiple Listing Service (RMLS) searchable database. A search of the active listings in April 2011 showed approximately 109 housing units listed for sale in Hayden Island, North Portland Harbor, and North Portland. Of that number, 40 were floating homes, 38 were condos, and 31 were conventional homes*

North Portland is not an adequate comparison geographically, socially or economically when considering the housing diversity on Hayden Island and North Portland Harbor.

In discussion with CRC staff, they seem to focus on relocation and yet dismiss the notion of any responsibility for seeking some rather obvious alternatives, including a replacement or expanded moorage. They have not addressed those that would be "temporarily" displaced at all. Relying on the Oregon tax code that considers floating homes "personal" rather than "real property" is simply not enough. In Oregon, floating homes and manufactured homes are considered the same a conventional homes.

> **310.622 Manufactured structures eligible as homesteads under tax laws of state.** A manufactured structure assessed under the ad valorem tax laws of this state shall be eligible to be a homestead for the purposes of all tax laws of this state giving a right or privilege to a homestead. For those manufactured structures assessed as real property, the manufactured structure homestead includes land and improvements to the same extent that a homestead would be recognized if the manufactured structure were a conventional home. [1971 c.529 §11; 1977 c.884 §16]
>
> (Floating Homes)
>
> **310.623 Floating home eligible as homestead.** A floating home, as defined in ORS 830.700, assessed under the property tax laws of this state shall be eligible to be a homestead for the purposes of all tax laws of this state giving a right or privilege to a homestead. [1977 c.615 §6]

The marina the study referred to above in the FEIS; beyond the inadequacies of the study itself; the FEIS does not adequately address the legal questions raised nor does it not fulfill the basic process questions of NEPA, the FEIS, Environmental Justice Act, Federal Highway Act nor the Uniform Real Estate Acquisition and Relocation Act of 1971.

As demonstrated throughout my analysis of this study it is simply not "virtually impossible" to develop a new marina in the private sector and certainly not true for the public sector either, especially given the significance of the CRC project.

P-105-001

Also as state in Chapter 5 of the FEIS:

> *In preparation for the FEIS analysis, project staff conducted a survey of owners and tenants of residential properties potentially displaced by the LPA. This survey determined the characteristics of the households displaced and how each residence is used. The development and distribution of this survey required coordination with property owners, as well as floating home moorage management and boards. The process by which surveys were developed and distributed, as well as the follow-up activities that were undertaken to encourage a high rate of return, are described in detail in the Environmental Justice Technical Report.*

Although CRC staff has indeed worked with those of us who will be displaced by this vital interstate link; the questionnaire failed to ask probably the most important question to those of us in the way.

How many of you would like to remain on the water?

If the scope of the marina study even considered the public nature of the project and the fact that the CRC project must adhere to the legal issues of eminent domain as a result, the study findings would properly be found to be significantly different than described. Certainly, building a freeway bridge over the Columbia River between Oregon and Washington, through several jurisdictions and layers of agency review, can not be less daunting of an undertaking, as this study implies, than permitting and construction of a moorage for those that will be displaced, or even considering, as required, by state and federal policy, alternative sites and proper analysis.

Out of deference to the author of the marina study, marine development is highly specialized and quite complex; a right of way coordinator can not be expected to know the myriad intricacies of my field of expertise. In the same token, I would probably be just as lost if I were to attempt to challenge him in his field of expertise.

This however, given the clear limitations based on the assumptions and limitations of the study (for example *"Marina development is totally a private entrepreneurial effort by individuals or corporations interested in developing a property for profit."*) must call into question if the scope of work and contract for the study pre-ordained the conclusion.

And;

As stated in the report:

> *This memo does not address the legal issues related to the relocation of floating homes by the Columbia River Crossing project under the Uniform Relocation Act.*

P-105-001 If the study didn't, the FEIS must.

As such the FEIS fails to meet the minimum standards required for moving ahead with approval or acceptance until these issues are resolved and adequate study and standards are followed.

Respectfully,



J. McCaulley

APPENDIX F

BIOLOGICAL OPINION

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to NMFS No:
2010/03196

January 19, 2011

John McAvoy, P.E.
Major Project Manager
Federal Highway Administration
Washington Division
Suite 501, Evergreen Plaza
711 South Capitol Way
Olympia, Washington 98501

R.F. Krochalis
Regional Administrator
Federal Transit Administration
915 Second Avenue, Suite 3142
Seattle, Washington 98174

Re: Endangered Species Act Section 7 Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Conservation Recommendations for the Columbia River Crossing (Federal #: HPP S001(250), Lower Columbia–Clatskanie Rivers (4th field HUC 17080003), Lower Columbia River (4th field HUC 17080006), and Lower Willamette River (4th field HUC 17090012), Oregon and Washington

Dear Messrs. Krochalis and McAvoy:

The enclosed document contains a biological Opinion (Opinion) prepared by the National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act (ESA) on the effects of the Federal Highway Administration (FHWA) and the Federal Transit Authority (FTA) partially funding the proposed Columbia River Crossing (CRC). The proposed CRC includes the replacement of the Interstate 5 freeway bridges across the lower Columbia River between Portland, Oregon and Vancouver, Washington. As co-leads, funding to design and engineer this project originates from the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), under sections 1101, 1701, 1702, and 5309 (23 U.S.C.) (New Starts Program).

In this Opinion, NMFS concluded that the proposed action is not likely to jeopardize the continued existence of Lower Columbia River (LCR) Chinook salmon (*Oncorhynchus tshawytscha*), Upper Willamette River (UWR) Chinook salmon, Upper Columbia River (UCR) spring-run Chinook salmon, Snake River (SR) spring/summer run Chinook salmon, SR fall-run Chinook salmon, Columbia River (CR) chum salmon (*O. keta*), LCR coho salmon (*O. kisutch*), SR sockeye salmon (*O. nerka*), LCR steelhead (*O. mykiss*), UWR steelhead, Middle Columbia River (MCR) steelhead, UCR steelhead, Snake River Basin (SRB) steelhead, southern green

sturgeon (*Acipenser medirostris*), eulachon (*Thaleichthys pacificus*), or eastern Steller sea lion (*Eumetopias jubatus*), or result in the destruction or adverse modification of critical habitats designated for any of the above listed species, except LCR coho salmon, for which critical habitat is not proposed or designated, eulachon, for which critical habitat is proposed but not yet designated, and eastern Steller sea lion, which does not have critical habitat designated in the action area.

In addition, NMFS concurred with the FHWA and FTA's determination that the proposed action is not likely to adversely affect the southern resident killer whale (*Orcinus orca*). The southern resident killer whale does not have critical habitat designated in the action area.

As required by section 7 of the ESA, NMFS is providing an incidental take statement with the Opinion. The incidental take statement describes reasonable and prudent measures NMFS considers necessary or appropriate to minimize the impact of incidental take associated with this action. The take statement sets forth nondiscretionary terms and conditions, including reporting requirements, that the FHWA and FTA must comply with to carry out the reasonable and prudent measures. Incidental take from actions that meet these terms and conditions will be exempt from the ESA's prohibition against the take of listed species considered in this Opinion, except for eastern Steller sea lion.

The NMFS did not include take of eastern Steller sea lions in this exemption because the FHWA and FTA are not authorized to take sea lions under section 101(a)(5) of the Marine Mammal Protection Act. If the FHWA and FTA obtain that authorization, they may request an amendment that will add eastern Steller sea lions to this exemption.

This document also includes the results of our analysis of the action's likely effects on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and includes two conservation recommendations to avoid, minimize, or otherwise offset potential adverse effects on EFH. These conservation recommendations are a subset of the ESA take statement's terms and conditions. Section 305(b)(4)(B) of the MSA requires Federal Agencies to provide a detailed written response to NMFS within 30 days after receiving these recommendations.

If the response is inconsistent with the EFH conservation recommendations, the FHWA and FTA must explain why the recommendations will not be followed, including the justification for any disagreements over the effects of the action and the recommendations. In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, we request that in your statutory reply to the EFH portion of this consultation, you clearly identify the number of conservation recommendations accepted.

If you have questions regarding this consultation, please contact Devin Simmons, Fishery Biologist in the Willamette Basin Habitat Branch of the Oregon State Habitat Office, at 503.231.2313.

Sincerely,

for William W. Stelle, Jr.
Regional Administrator

cc: Jim Brick, ODFW
Frannie Brindle, ODOT
Jaimee Davis, USACE
Anne Friesz, WDFW
Alex Liverman, DEQ
Steve Morrow, CRC
Kathy Roberts, USFWS
Terry Swanson, WDOE
Yvonne Valette, USEPA

Endangered Species Act
Section 7 Biological Opinion

and

Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Conservation Recommendations

for the

Columbia River Crossing (Federal #: HPP S001(250),
Lower Columbia–Clatskanie Rivers (4th field HUC 17080003),
Lower Columbia River (4th field HUC 17080006), and
Lower Willamette River (4th field HUC 17090012),
Oregon and Washington

Lead Action Agencies:	Federal Highway Administration Federal Transit Authority
Consultation Conducted By:	National Marine Fisheries Service Northwest Region
Date Issued:	January 19, 2011
Issued by:	for William W. Stelle, Jr. Regional Administrator
NMFS No.:	**2010/03196**

TABLE OF CONTENTS

INTRODUCTION 1
Background and Consultation History 1
Description of the Proposed Action 3
Columbia River Bridge 4
North Portland Harbor Bridge 8
Roadways 10
Transit 11
Off-site Construction and Staging 12
Stormwater Management 13
Additional Impact Avoidance and Minimization Measures 18
Interrelated and Interdependent Actions 18
Action Area 19
ENDANGERED SPECIES ACT BIOLOGICAL OPINION 21
Status of the Species and Critical Habitat 21
Status of the Species 23
Status of the Critical Habitats 37
Environmental Baseline 46
Species within the Action Area 48
Critical Habitat within the Action Area 54
Effects of the Action 57
Species within the Action Area 60
Effects on Critical Habitat within the Action Area 68
Cumulative Effects 70
Synthesis and Integration of Effects 71
Species at the Population Scale 71
Critical Habitat at the Watershed Scale 74
Conclusion 74
Incidental Take Statement 75
Amount or Extent of Take 75
Reasonable and Prudent Measures 78
Terms and Conditions 78
Conservation Recommendations 86
Reinitiation of Consultation 86
MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT 87
Essential Fish Habitat Conservation Recommendations 87
DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW 88
LITERATURE CITED 90
Appendix A. Southern Resident Killer Whale Determination 110
Appendix B. Run Timing and Presence of Listed Fish in the I-5/CRC 111

LIST OF ABBREVIATIONS

BA	Biological Assessment
BMP	Best Management Practice
CFR	Code of Federal Regulations
CHART	Critical Habitat Analytical Review Team
CIA	Contributing Impervious Area
CRC	Columbia River Crossing
dB	Decibel
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FHWA	Federal Highway Administration
FR	Federal Register
FTA	Federal Transit Authority
HUC	Hydraulic Unit Code
I-5	Interstate Freeway 5
LCR	Lower Columbia River
MCR	Mid Columbia River
MP	Mile Post
MSA	Magnuson Stevens Act
NMFS	National Marine Fisheries Service
ODOT	Oregon Department of Transportation
OHW	Ordinary High Water
PCE	Primary Constituent Element
Re: 1μPa	Reference 1 MicroPascal
RM	River Mile
RMS	Root Mean Squared
ROW	Right of Way
SEL	Sound Exposure Level
SR	Snake River, or State Route
SRB	Snake River Basin
TRT	Technical Review Team
UCR	Upper Columbia River
U.S.C.	United States Code
UWR	Upper Willamette River
VSP	Viable Salmonid Population
WLC	Willamette/Lower Columbia
WDOT	Washington State Department of Transportation

INTRODUCTION

This document contains a biological Opinion (Opinion) that was prepared by the National Marine Fisheries Service (NMFS) in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531, *et seq*.), and implementing regulations at 50 CFR 402.[1] It also contains essential fish habitat (EFH) conservation recommendations prepared by NMFS in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801, *et seq*.) and implementing regulations at 50 CFR 600. The Opinion and EFH conservation recommendations are both in compliance with section 515 of the Treasury and General Government Appropriations Act of 2001 (Data Quality Act) (44 U.S.C. 3504 (d)(1) and 3516), and underwent pre-dissemination review. The administrative record for this consultation is on file at the Oregon State Habitat Office in Portland, Oregon

Background and Consultation History

The Federal Highway Administration (FHWA) and Federal Transit Authority (FTA) propose to use their authority under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), under sections 1101, 1701, 1702, and 5309 (New Starts Program) to complete preliminary engineering and an environmental impact statement (EIS) for the Interstate 5 (I-5) Columbia River Crossing (CRC). The CRC project planning team (CRC Team) consists of staff from the FHWA and FTA and their agents, the Washington Department of Transportation (WDOT) and the Oregon Department of Transportation (ODOT). This Opinion is necessary to complete the EIS.

On August 23-24, 2005, the NMFS began coordination with the CRC Team at an interagency workshop to coordinate development of an EIS.

On February 28, 2006, NMFS agreed to participate in the CRC Interstate Collaborative Environmental (InterCEP) Process Group, a NEPA compliance streamlining effort, by signing the January 25, 2006 InterCEP Agreement (CRCP 2006).

On November 9, 2006, NMFS submitted official technical guidance for use within the draft EIS.

On August 6, 2008, NMFS submitted official comments on the CRC Draft EIS.

On October 20, 2009, NMFS facilitated a CRC Team and Fish Passage Advisory Group (FPAC) coordination meeting to gain the best available fish abundance, presence, and timing data available for the 13 species of Pacific salmon and steelhead species affected by the action.

[1] With respect to designated critical habitat, the following analysis relied only on the statutory provisions of the ESA, and not on the regulatory definition of "destruction or adverse modification" at 50 CFR 402.02.

On June 25, 2010, after an extended period of informal consultation, the FHWA and FTA requested formal consultation under section 7 of the ESA and EFH consultation under the MSA. They concluded that the proposed action is not likely to adversely affect southern resident killer whale (*Orcinus orca*), and is likely to adversely affect the following 16 ESA-listed species and their designated critical habitats (critical habitat has not been designated or proposed for LCR coho salmon or eulachon), and would adversely affect EFH designated for Chinook and coho salmon:

- Lower Columbia River (LCR) Chinook salmon (*Oncorhynchus tschawtscha*),
- Upper Willamette River (UWR) Chinook salmon,
- Upper Columbia River (UCR) spring-run Chinook salmon,
- Snake River (SR) spring/summer run Chinook salmon,
- SR fall-run Chinook salmon,
- Columbia River (CR) chum salmon (*O. keta*),
- LCR coho salmon,
- SR sockeye salmon (*Oncorhynchus nerka*),
- LCR steelhead (*O. mykiss*),
- UWR steelhead,
- MCR steelhead,
- UCR steelhead,
- Snake River Basin (SRB) steelhead
- southern green sturgeon (*Acipenser medirostris*)
- eulachon (*Thaleichthys pacificus*), and
- eastern Steller sea lion (*Eumetopias jubatus*).

On August 11, 2010, NMFS notified the FHWA and FTA that the BA was complete and that NMFS will complete a biological opinion by November 7, 2010.

On September 22, 2010, the CRC Team provides NMFS with the final data summaries of ESA-listed salmon, steelhead, and eulachon of presence, abundance, timing, and calculated hydroacoustic related take estimates for use in formal consultation. This represents a culmination of coordination with NMFS and the FPAC.

On September 23, 2010, the FHWA and FTA submit a draft final stormwater design package for use in the Opinion.

On September 28, 2010, the FHWA and FTA replied to a letter from the NMFS Office of Protected Resources, dated August 12, 2010, regarding the CRC Team's request for a Letter of Authorization for incidental take under the Marine Mammal Protection Act.

On October 4, 2010, the FHWA and FTA submit final details qualifying the September 23, 2010 transmittal. Final engineering will continue as final design of the action occurs.

On October 13, 2010, the FHWA and FTA notified NMFS that service changes to the new North Portland Harbor bridges is likely after the conclusion of consultation. This would add a direct local connection between Hayden Island and North Marine Drive. However, this addition would not change the degree or amount of effects addressed in this Opinion due to using already planned for bridge structure. In addition, the project may be phased due to funding, which could prolong the construction.

On October 19, 2010, the FHWA and FTA provided an additional response to the NMFS Office of Protected Resources. This response included a new analysis of the effects of the proposed CRC on eastern Steller sea lions, and an addendum to BA Appendix K with final calculations of the impacts of underwater noise to fish.

On October 21, 2010, the FHWA and FTA submit final elements of the proposed action, including a test pile program to be completed before CRC construction begins.

On November 17, 2010, the FHWA and FTA submitted a final application for incidental take under the Marine Mammal Protection Act that revised the analysis of effects of the CRC on eastern Steller sea lions.

On December 8, 2010, NMFS, FHWA and FTA concur that the test pile program has separate utility and function from the CRC, and would be consulted on separately (see NMFS 2010).

Description of the Proposed Action

The FHWA and FTA will complete a multimodal transportation improvement project within a 5-mile corridor of I-5 to improve safety; reduce traffic congestion; increase mobility of motorists, freight, bicyclists, and pedestrians from Vancouver, Washington to Portland, Oregon; and to extend the light-rail train (Tri-MET's Yellow Line MAX) from Delta Park, in Portland, Oregon, to Clark College in Vancouver, Washington (Figure 1). Construction will begin in September 2012, and end in December 2020.

The proposed action will include replacement of the current pair of I-5 bridges spanning the lower Columbia River. It will also add three new bridges that cross the North Portland Harbor, and widen the existing I-5 crossing over the harbor as well. Construction of the lower Columbia River bridges would occur from 2013 – 2017, and Harbor bridge construction would occur from 2013-2016. FHW and FTA plan to complete construction below ordinary high water (OHW) for both bridges by April 2017. The in-channel portion of the work will occur within a tidally influenced area that terminates approximately 40 river miles upstream of the project area at Bonneville Dam.



Figure 1. Alignments of the proposed Columbia River Crossing highway improvements, bridges, and light rail features.

Columbia River Bridge

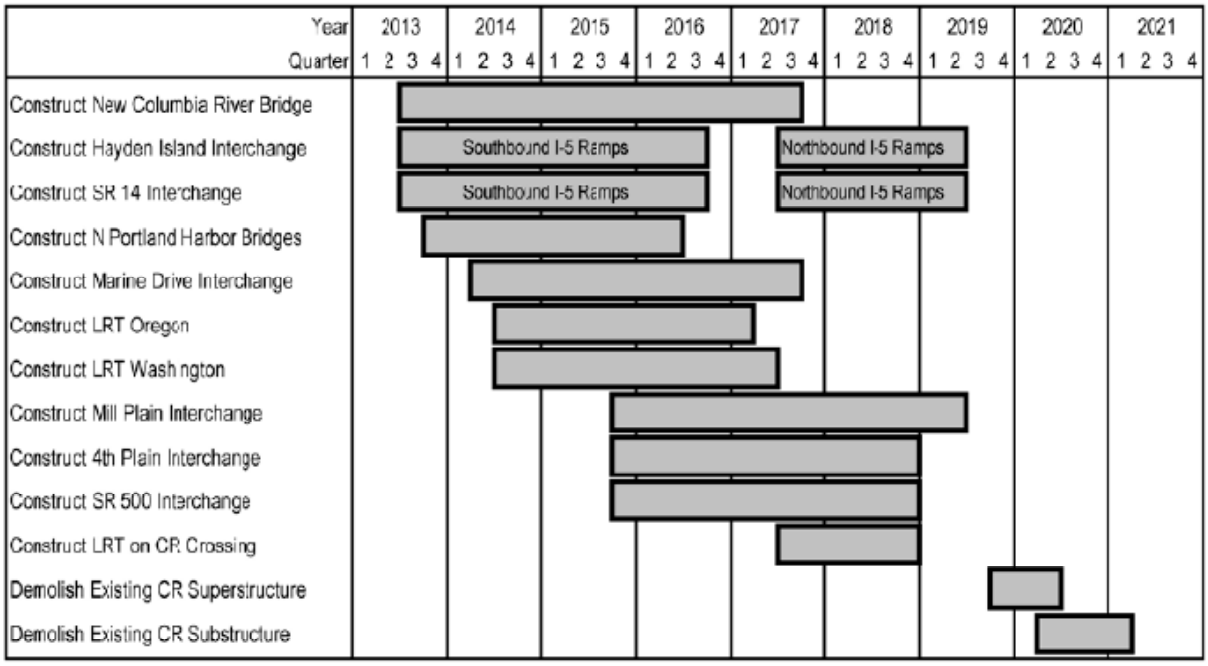
The northbound and southbound replacement structures located at Columbia river mile (RM) 106 will be constructed downstream of the current crossing on a curved alignment to preserve the existing points of landward alignment for ingress and egress of the crossing. These bridges will have a 15 foot gap between them, spanning the lower Columbia River from Vancouver, Washington, to Hayden Island, Portland, Oregon (Table 1):

Table 1. Approximate width, length and clearance of the proposed Columbia River Crossing bridge over the mainstem of the lower Columbia River.

Bridge	I-5 Northbound	I-5 Southbound (with light rail)
Width over water (ft)	Varies: 91-130	Varies: 91-130
Length over water (ft)	2,700	2,650
Bridge Clearance (ft)	Varies: 95	Varies: 95

The bridges' substructure will be supported by eight matched pier sets, 16 piers total, each supported by a complex of up to nine 10 foot diameter columns and a pier cap. These pier sets are numbered 1-8 with the sequence beginning landward on Hayden Island and ending landward in the City of Vancouver. Only sets 2-7 will be built below OHW (*i.e.*, 17.6 feet National Geodetic Vertical Datum) (Corps 2004), and use 88 columns. The FHWA and FTA will construct these columns using a sequential drilled-shaft technique (Table 2).

Table 2. Estimated timeline for construction of the proposed Columbia River Crossing bridge over the mainstem of the lower Columbia River.



CR = Columbia River; LRT = Light Rail Transit; N = North; SR = State Route

Each shaft will be constructed by first advancing a 10 foot diameter steel casing either by use of a vibratory hammer or by using hydraulic rams to oscillate or rotate it through river bottom sediments into the Troutdale Formation, a geologic layer of consolidated aggregate. Advancement would continue several feet into this formation, which may be up to approximately

272 feet below OHW. The casing is then drilled (hollowed) and the tailings removed for disposal, a re-bar cage is dropped into place, and the shaft is filled with concrete. The casing will be removed for re-use. Once all of the columns within a complex are finished then they are joined by poured (in-place) concrete and steel fittings to form a pile-cap. This kind of work is typically contained by a form that is floated into place by barges. The cap and its columns bear the load placed upon the pier that it supports entirely.

To construct the bridge piers, temporary round hollow-steel pile will be installed to create temporary work platforms, work bridges, falsework, and vessel tethers that will support equipment and people necessary to construct the piers and the superstructure of the bridge itself (Table 3). Equipment likely to be supported includes but is not limited to cranes, generators, and hydraulic rams. Load-bearing piles will be installed by first advancing them to a point of refusal using a vibratory hammer, and then using an impact hammer to proof, or test, each pile for a specified vertical load bearing capacity. Non-load bearing piles will be advanced to refusal only.

Table 3. Estimated number of cofferdams and piles necessary to complete the temporary in-water structure for the proposed Columbia River Crossing bridge over the mainstem of the lower Columbia River.

	Count
Cofferdams	2
Pipe Piles	
Load Bearing 18-24 inches	600
Load Bearing 36-48 inches	240
Non-Load Bearing 18-24 inches	384
Total	**1,224**
Support Structures	18
Barges	Up to 12 at a single time

Impact driving will be non-continuous, and within discrete blocks across 31-weeks of in-water work from September 15 through April 15 of each year (Table 4). Pile driving will occur every year for 6-years. The impact driving strike rate is 40-strikes per minute. Daily pile installation includes up to 6-piles, three 18-24 inch piles and three 36-48 inch piles. Impact driving may occur across a 12-hour period each day, but will not include more than 1-hour of actual pile driving activity. Vibratory driving without impact driving will occur year-round, as needed. The total number of days of impact pile driving in the Columbia River will be between 138 and 142 days.

Table 4. Example of sequence of pile driving and removal for the Columbia River Crossing bridges.



FHWA and FTA expect that temporary pile will be advanced 70-140 feet below the channel bottom. Additionally, cofferdams are likely to be installed around the sites of pier sets 2 and 7. These shallow areas may preclude the use of barges, so that temporary work bridges and cofferdams will be constructed to allow equipment and construction worker access.

Above water structures will be fabricated at an off-site location, barged into alignment, and lifted by crane into place for attachment. Off-site locations used for overall construction staging and pre-fabrication of bridge segments are likely to occur at the following locations:

- The Port of Vancouver near Terminal 3 (52 acres)
- The Red Lion at the Quay Hotel (2.6 acres), acquired through right-of-way (ROW).
- The vacant Thunderbird Hotel (5.6 acres), acquired through ROW.

Demolition of the current bridges will occur over approximately 1.5 years, from September 2018 through March 2020. Demolition will commence once the following project components are complete: (1) Construction of the north and southbound replacement bridges; (2) redevelopment of the SR 14 interchange; (3) redevelopment of the Hayden Island interchange; and (4) routing of north and southbound traffic onto the new bridges. Demolition of the superstructure will begin with removal of the counterweights. The contractor will lock the lift-span into place and the counterweights cut into pieces and transferred off-site via truck or barge. Next, the contractor will cut the lift towers into manageable pieces and load them onto barges. Prior to removal of the trusses, the deck will be removed by cutting it into manageable pieces; these pieces will be transported by barge or truck or by using a breaker, in which case debris will be caught on a barge or other containment system below the work area. After contractors demolish the deck, they will lift the trusses onto barges and transfer them to off-site locations for final demolition. Finally, the contractors will use a diamond wire saw to cut the piers into manageable sections before transporting them offsite to complete demolition.

In addition, nine sets of the 11 existing Columbia River bridge piers are below the OHW level and are supported on a total of approximately 1,800 driven timber piles that are assumed to be treated with a creosote wood preservative- direct evidence is not evident nor readily accessible. The FHWA and FTA would remove only those vacant piles that pose a navigation hazard within the navigation channels and protrude above the surface channel bed. These would be removed via vibratory extraction, direct pull, clamshell dredge, or use of an underwater saw to cut below channel bottom. The number of piles is unknown as original spec sheets are not demonstrable of this element. If treated, the removal of piles or containment is of concern due to the presence of polycyclic aromatic hydrocarbons and heavy metals, which are toxic to aquatic life including fish.

North Portland Harbor Bridge

The current I-5 bridge that crosses the North Portland Harbor, a channel of the lower Columbia River, will be widened with the addition of a south-bound automobile ramp. Widening of the existing structure will require the addition of eight, 10-foot diameter drilled shaft columns. Unlike the Columbia River bridges, these columns will connect directly to the superstructure, avoiding the need for a pile-cap. The addition of three new bridge alignments will carry local traffic from Hayden Island to Marine Drive, the I-5 northbound collector distributor ramp, the I-5 southbound collector distributor, and the light rail train and bike/pedestrian path (Figure 2). These alignments diverge from the I-5 alignment on Hayden Island. The first requires five drilled shafts, the second requires five drilled shafts, and the third requires 12 drilled shafts. Construction of the North Portland Harbor bridge will follow the same sequence of pile driving and removal as the Columbia River bridge (Table 4) and require the use of barges and temporary piles (Tables 5 and 6).

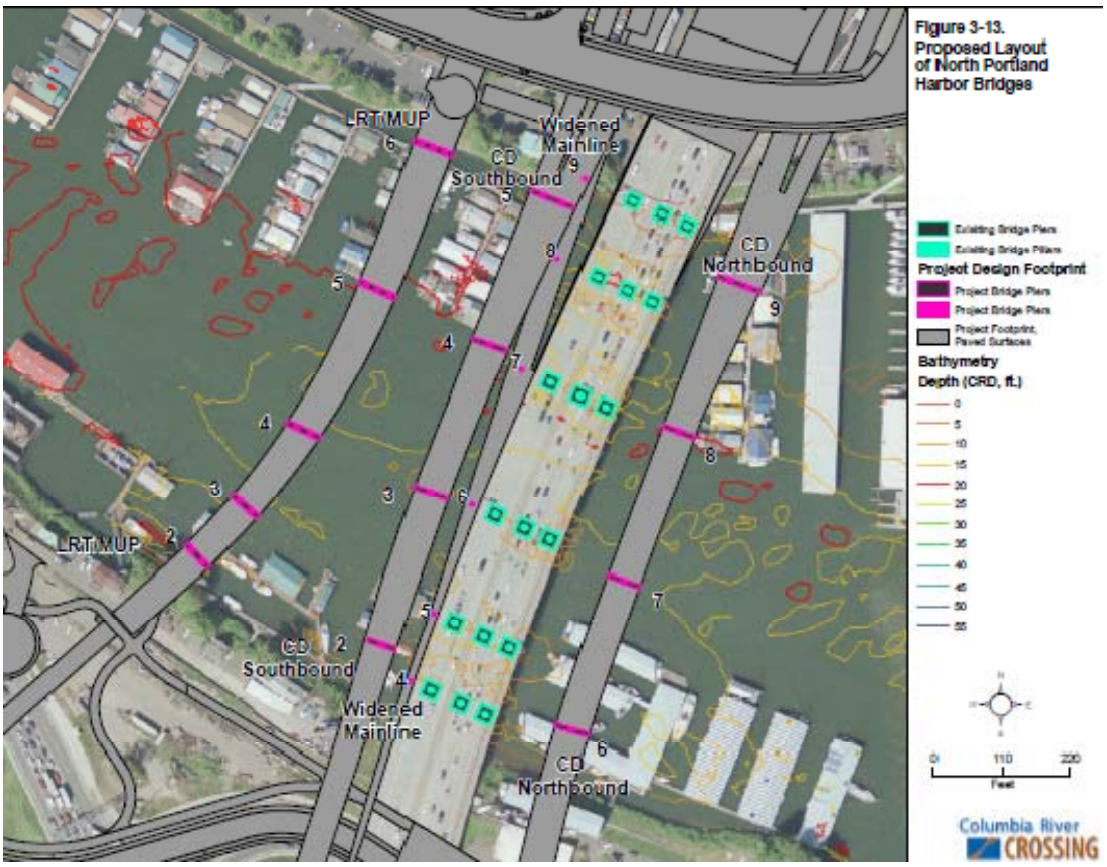


Figure 2. Substructure locations for the proposed Columbia River Crossing bridges over the North Portland Harbor.

Table 5. Estimated number of piles necessary to complete the temporary in-water structure for the proposed Columbia River Crossing bridges over the North Portland Harbor.

	Count
Pipe Piles	
Load Bearing 18-24 inch	600
Load Bearing 36-48 inch	240
Non-Load Bearing 18-24 inch	384
Total	**1,224**
Support Structures	18
Barges	Up to 12 at a single time

Table 6. Approximate length and width of the proposed Columbia River Crossing bridges over the North Portland Harbor.

Bridge	LRT and Bike/Ped Path	I-5 Southbound Collector-Distributor	Widened Mainline	I-5 Northbound Collector-Distributor
Width Over Water	Varies 50-65 ft	Varies 50-82 ft	Varies 162-200 ft	Varies 57-82 ft
Length Over Water	Approx. 875 ft	Approx. 945 ft	Approx. 990 ft	Approx. 1,020 ft

Unlike at the Columbia River mainstem location, cofferdams will not be used in North Portland Harbor, and only those parts of the remnant structure that are in the way of the new structure will be removed. The material is generally at or below grade, and will be removed via a clamshell dredge will be used to minimize material loss into the channel.

Roadways

Improvements will modify the I-5 thoroughfare for the length of the project from Oregon milepost (MP) 305.9 to Washington MP 3.1, approximately 5-miles. Of that, approximately 2.5 miles constitute the landward or non-bridge portions of I-5 itself. Depending on the road segment, modifications will include some combination of lane widening, lane additions, repaving, pavement overlays, shoulder expansion, road-prism elevation increase, and replacement.

Three interchanges in Portland and four in Vancouver will be improved. These include from south to north the Marine Drive, Victory Boulevard, Hayden Island, Washington State Route (SR) 14, Mill Plain Blvd., Fourth Plain Blvd, and the Washington SR 500 interchanges.

In addition to interchange improvements, highway safety and mobility will be improved with a series of auxiliary (add/drop) lanes that will be sequentially added and then dropped at strategic locations through the corridor. The add/drop lanes will allow vehicles to travel between given points without merging into mainline interstate traffic, and will allow vehicles exiting or entering to minimize conflicts with through traffic. From the south end of the project area, I-5 northbound will add one auxiliary lane starting where the Victory Boulevard on-ramp enters I-5. Another auxiliary lane will be added where the Marine Drive on-ramp enters I-5. An optional third auxiliary lane will be added where Hayden Island traffic enters I-5 over the river. One of these lanes will be dropped at the SR 14 off-ramp, and a second will be dropped at the Mill Plain off-ramp. North of the Mill Plain off-ramp, the number of auxiliary lanes will vary between one and three.

Lanes will be added or dropped as the various on-ramps and off-ramps enter or exit I-5 at each subsequent interchange. Southbound I-5 and the associated interchanges and ramps will have a similar series of add/drop lanes. The interchanges and lane improvements will extend roadway improvements to local roadways within the jurisdiction of the cities of Portland and Vancouver.

Transit

Currently light rail train operated by TriMET originates and terminates in Oregon without service to Vancouver. The action would extend TriMet owned light rail train service from Portland to Vancouver northwest through Washington and Broadway Street to and onto W 17th Street northeast until its terminus at Clark College. Three park-and-ride facilities will be constructed in Vancouver: The SR 14 Park and Ride (I-5 and SR 14), Mill District (Washington, East 16th, main, and East 15th Street block), and Clark College (Figure 3). To support this extra capacity expansion of the TriMet Ruby Junction Maintenance Facility in Gresham Oregon will occur. Approximately 5.4 acres of pavement will be added to the site. Bus routes and capacity will changed as well, and will be incorporated into the park-and-ride and light rail train path improvements. As discussed previously, the addition of light rail train will result in the construction of a new bridge across North Portland Harbor, to be incorporated into the CRC bridges, and the addition of a landward ingress/egress path on Hayden Island and within Vancouver.

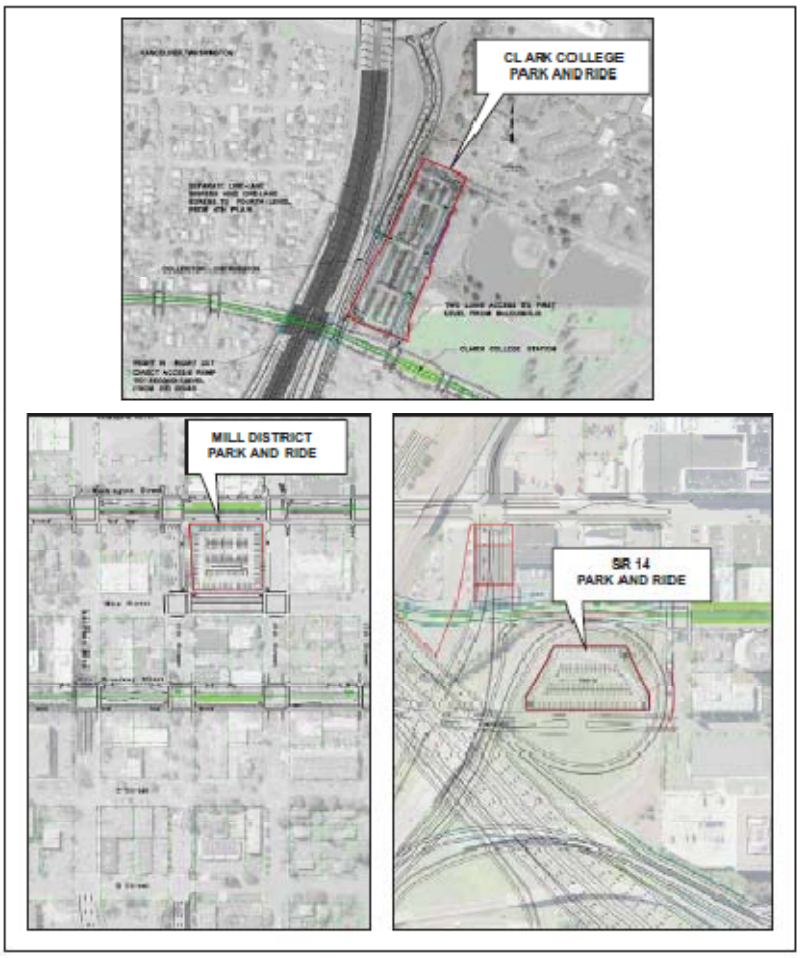


Figure 3. Light rail train Park and Ride facilities for the proposed Columbia River Crossing.

Off-site Construction and Staging

The FHWA and FTA have proposed to use non-CRC corridor locations for use for material and equipment staging, pre-fabrication of bridge elements, and for final demolition of current bridge element. The FHWA and FTA have identified and included sites likely for this use in the action area. They are as follows:

- **Port of Vancouver Staging Area**. This 52-acre site is located along SR 501 near the Port of Vancouver's Terminal 3 North facility. This site is without river frontage, so materials would be transported over land to the construction site. Activities will consist of material storage, material fabrication, equipment storage and repair, and temporary buildings.
- **Alcoa/Evergreen**. This 94.5-acre site would be a major casting/staging yard and is located on the north shore of the lower Columbia River at approximately River Mile

(RM) 102. It is undergoing environmental remediation prior to the anticipated 2013 start date.

- **Red Lion Staging Area.** This is a 2.6-acre site on the north shore of the lower Columbia River, immediately downstream of the existing bridge alignment. Acquisitions would occur through ROW, possibly through purchase. It requires partial demolition of the Red Lion at the Quay Motel. This site would be a staging site for materials and equipment and for fabrication of smaller bridge and roadway components. Temporary buildings, such as trailers or other mobile units would also be included.
- **Thunderbird Staging Area.** This is a 5.6-acre site on Hayden Island on the south shore of the lower Columbia River, immediately downstream of the existing bridge alignment. A large portion of the parcel will be acquired as new ROW for the new bridge alignment. The site is relatively large and it is adjacent to the river and the construction zone. The same types of activities could occur on this site as on the Red Lion Hotel site.
- **Sundial Casting Area.** This 56-acre site lies on the south shore of the lower Columbia River near RM 120.2. This currently serves as an industrial rock product processing facility.

Stormwater Management

The action will include management and treatment for a contributing impervious area (CIA) of approximately 296 acres. The FHWA and FTA have delineated the CIA to be equal to the boundaries of the Columbia River Crossing corridor, which includes I-5 ROW and any work done to local roadways in Portland and Vancouver. The CIA include any terrestrial roadway or bridges, bridge decks that function as the I-5 thoroughfare, ingress and egress ramps, local access, and mass transit/automobile mergers. Stormwater management through treatment will reduce pollutant loads and alter pollutant speciation of stormwater before discharge into ESA-fish bearing watersheds. The CIA consists of from south to north the Columbia Slough basin, the Columbia River basin, and the Burnt Bridge Creek basin (Figures 4 – 6). The FHWA and FTA plan to capture and treat all stormwater runoff from the CIA up to the design storm, although a stormwater management plan for 6.8 acres of CIA is still incomplete (Table 7).

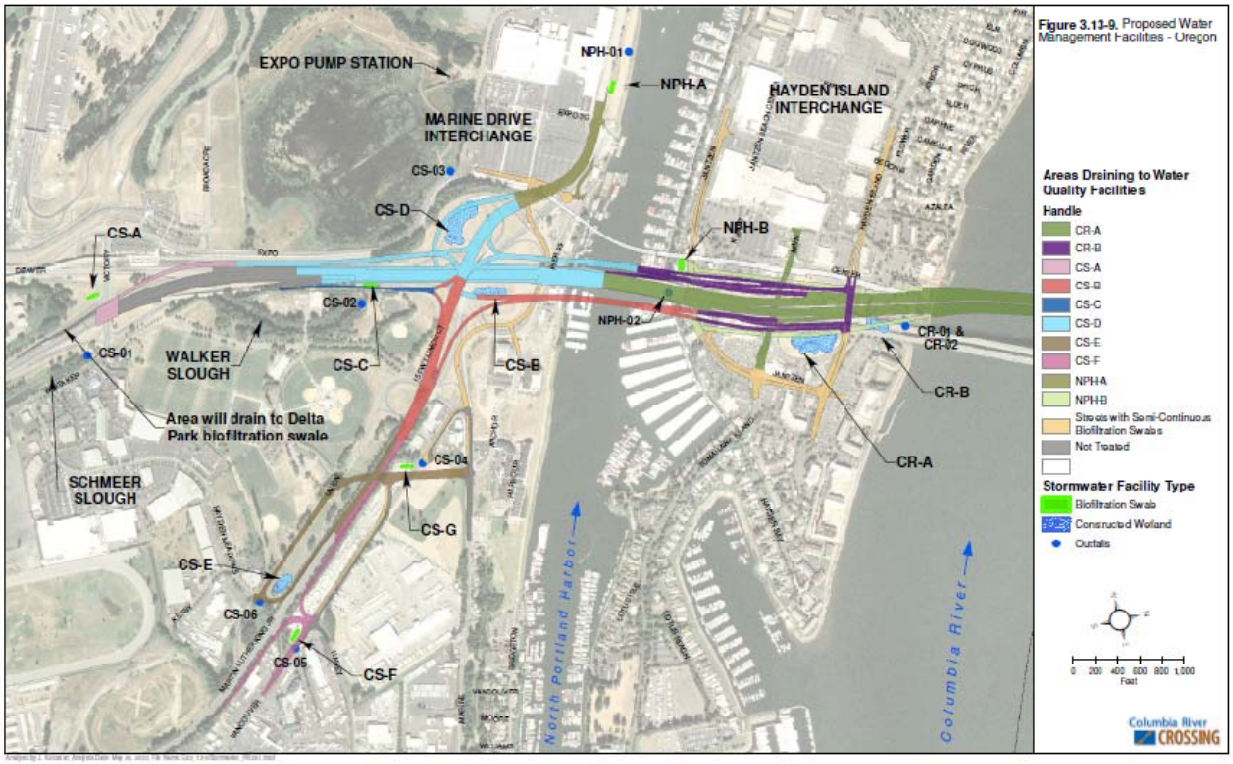


Figure 4. Overview of the contributing impervious area and stormwater treatment basins (southern segment) for the proposed Columbia River Crossing project.

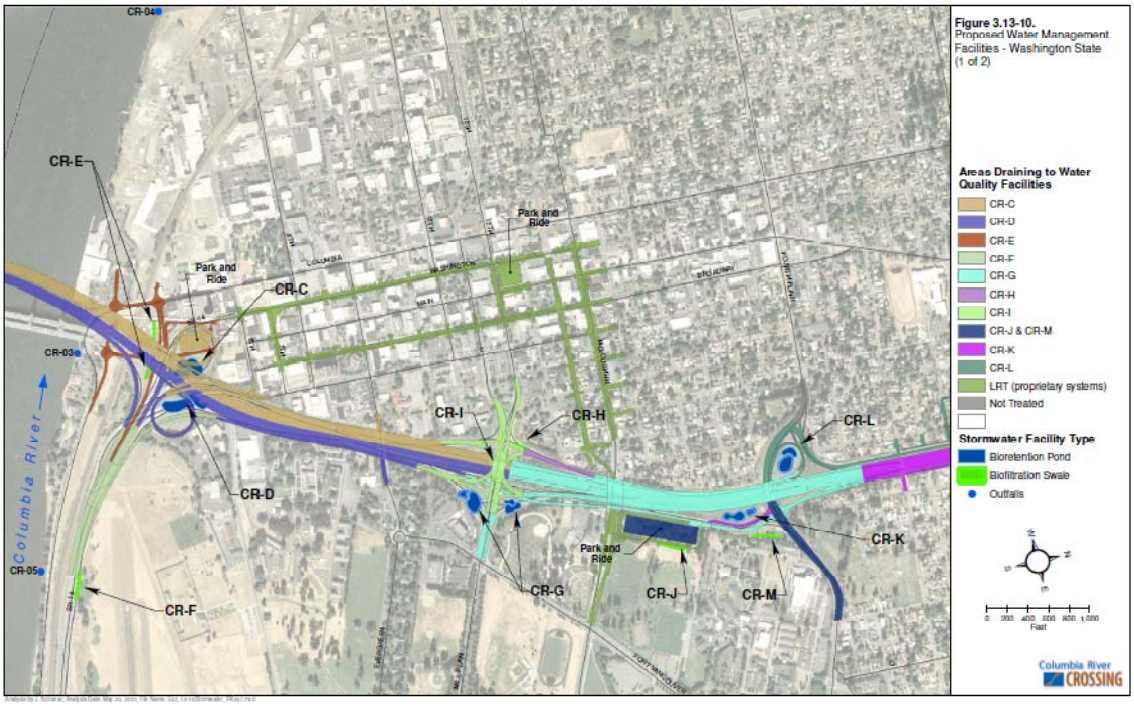


Figure 5. Overview of the contributing impervious area and stormwater treatment basins (middle segment) for the proposed Columbia River Crossing project.

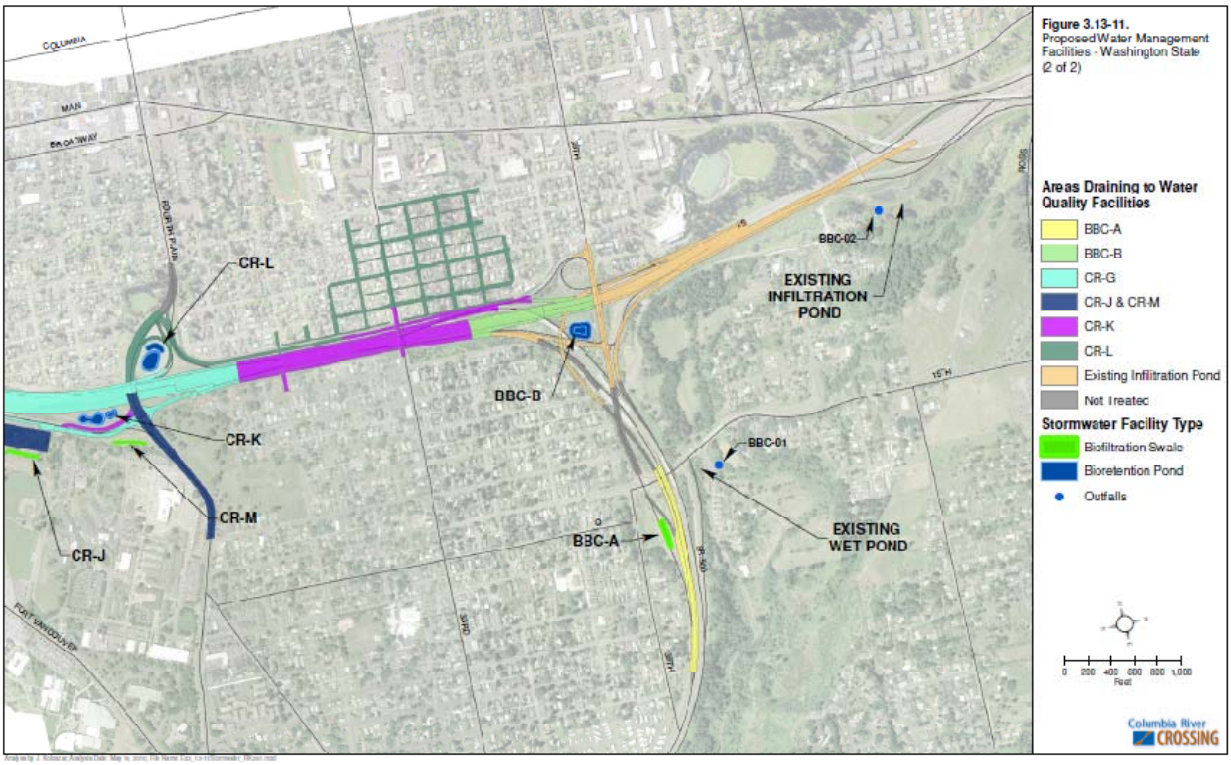


Figure 6. Overview of the contributing impervious area and stormwater treatment basins (northern segment) for the proposed Columbia River Crossing.

Table 7. Summary of the contributing impervious area management for the Columbia River Crossing at time of consultation**.**

Watershed	Total CIA (acres)	Treated CIA (acres)	Untreated CIA (acres)
Burnt Bridge Creek	21.9	21.9	0
Columbia River	217.9	216.9	1.0
Columbia Slough	55.7	49.9	5.8
Total	295.5	288.7	6.8

Final engineering and design of the roadways, bridge decks, and stormwater treatment facilities is not complete. For the consultation, the FHWA and FTA have submitted design and engineering at varying stages of completeness for stormwater management, up to 30%. Design elements while mostly fixed are approximate and subject to change. The following demonstrates the design approach and methods of treatment within the following management parameters:

1. Treatment capacity design will meet standards and specifications found in WDOT's Highway Runoff Manual (WDOT 2010a), and thus exceed 50% of the 2-year, 24-hour storm.
2. The CIA in the Burnt Bridge Creek watershed is the only area that requires stormwater quantity treatment because it is the only non-mainstem or non-tidal waterbody that will receive stormwater discharge from the project area. This treatment will ensure that the stormwater runoff does not alter change stream hydrology by limiting the rate of stormwater discharge to 50% of the 2-year event.
3. Stormwater quality treatment will consist of one or more of the following methods:
    a. Bioretention ponds are infiltration ponds that use an engineered (amended) soil mix to remove pollutants as runoff infiltrates through this zone to the underlying soils. The primary mechanisms for pollutant reduction are filtration, sorption, biological uptake, and microbial activity. While this best management practice (BMP) is best suited to sites with Hydrologic Group A and B soils, it may be used for Group C and D Hydrologic Group soils with the addition of an underdrain system to collect infiltration runoff and direct it to a stormwater conveyance system. An infiltration rate of 1 inch per hour was assumed when estimating the size of these facilities. If the soils cannot sustain this rate and there is insufficient space to increase the pond size to accommodate a lower value, underdrains will be installed.
    b. Constructed treatment wetlands are shallow, permanent, vegetated ponds that function like natural wetlands. They remove pollutants through sedimentation, sorption, biological uptake, and microbial activity.
    c. Soil-amended biofiltration swales are trapezoidal channels with mild slopes and shallow depths of flow. The channels are dry between storm events and are typically vegetated. They treat runoff by filtration and sorption as runoff flows through the grass surface and amended soils. Amended soils, especially compost-amended, constitute an excellent filtration medium. Compost-amended soils have a high cation exchange capacity that will bind and trap dissolved metals. Similar to bioretention ponds, an underdrain system is recommended for sites with Group C and D Hydrologic Group soils.
    d. Soil-amended filter strips treat sheet runoff from an adjacent roadway surface. Similar to grass swales, filter strips treat runoff by filtration and sorption as runoff flows through the vegetated surface and amended soils. In a confined urban setting such as the project corridor, opportunities to use this BMP are limited.
    e. Bioslopes, like filter strips, treat sheet runoff from an adjacent roadway surface. They comprise a vegetated filter strip, infiltration trench, and underdrain, and reduce pollutants through sorption and filtration. The percolating runoff flows through a special mixture of materials, including dolomite and gypsum, which

promotes the adsorption of pollutants. Bioslopes are also known as media filter drains and ecology embankments.

Other water quality BMPs, including dispersal, drywells and proprietary systems, such as cartridge filters, may be used when limiting factors prevent the use of these BMPs are prevented by lack of suitable space, soils non-conducive to infiltration, polluted soils, and protection of historic building foundations. Pre-treatment facilities including baffle type oil-water separators and coalescing plate oil-water are likely also. Their use is common in high average daily trip areas to protect the treatment facilities and to prevent overwhelming of the treatment technology. Accidents and spills are expected to occur on interstate freeways.

All treatment facilities will be designed and engineered to use the preceding techniques singly, or in combination, to achieve treatment. Engineering criteria including facility dimensions, depth, area, slopes, and materials (abiotic and biotic); and design parameters from the WDOT Runoff Manual (WDOT 2010a) will be used and met when designing these facilities.

Additional Impact Avoidance and Minimization Measures

The applicant proposes to implement the following BMPs as impact avoidance and minimization measures. These BMPs were included in the BA and are a nondiscretionary part of the proposed action. The FHWA and FTA will ensure that their contractors will:

1. Prepare and carry out an Erosion and Sediment Control Plan for any part of the project that requires a ground disturbing activity, such as land clearing, vegetation removal, grading, ditching, filling, embankment compaction, or excavation, including any erosion that may result from weather, the nature of the construction materials used, or the stage or work.
2. Prepare and carry out a Spill Prevention Control and Countermeasures and an Erosion and Spill Control Plan for any potentially hazardous material that will be stored or used at the project site to prevent or contain accidental spills in the work/repair area to insure no contaminants escape containment to surface waters.
3. Limit entrapment and disturbance to benthic habitats through use of wire-saw demolition of existing bridge piers instead of cofferdams.
4. Reduce underwater sound from underwater structure installation through use of the drilled shaft method to install the permanent in-water bridge structure, use of the ‘vibe and proof’ pile installation technique to install temporary piles, and complete all monitoring as described in the underwater sound monitoring plan.
5. Use directional techniques for all construction lighting to reduce nighttime illumination of the lower Columbia River.

Interrelated and Interdependent Actions

Effects of the action under consultation are analyzed together with the effects of other activities that are interrelated to, or interdependent with, that action (50 CFR 402.01). Interrelated actions are those that are part of a larger action and depend on the larger action for their justification, and

interdependent actions are those that have no independent utility apart from the action under consideration.

The BA identified the following actions and interrelated and interdependent with CRC: (1) CRC maintenance; (2) compensatory mitigation to comply with section 404 of the Clean Water Act; (3) utility relocation during construction; (4) construction and operation of additional staging areas; (5) acquisition and relocation of existing floating homes in North Portland Harbor; (6) design and operation of a pump station in an unnamed channel of the Columbia Slough; and (7) transit-oriented development on Hayden Island.

The present level of planning for these actions is not sufficient to support a complete analysis of effects that are reasonably certain to occur on ESA-listed species or their designated critical habitats. Nonetheless, after due consideration, NMFS concluded that the effects of CRC maintenance, compensatory mitigation, and utility relocation are likely to be within the range of actions that have already completed formal consultation (*e.g.*, NMFS 2008a, 2008b). Additional staging areas are within the range of effects considered in this consultation. Acquisition and relocation of existing floating homes, the Columbia Slough pump station, and development on Hayden Island are actions that will have independent utility and, depending on their eventual disposition, are likely to be the object of a future consultation.

Action Area

Action area means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). For this consultation, the action area will include: (1) The area where underwater noise caused by pile driving will exceed background; (2) the lower Columbia River where dissolved and suspended pollutants caused by stormwater runoff from CRC is redistributed to the Pacific Ocean; and (3) the eastern Pacific Ocean where southern resident killer whales overlap with Chinook salmon from the Columbia basin.

Background noise levels for the project site are not available.[2] However, due to the curvature of the river and islands present, underwater sound from impact pile driving is expected to reach land well before attenuating to assumed background sound levels of 120 dB (re: 1μPa) root mean square. Thus, the action area is not expected to extend beyond Sauvie Island, about 5.5 miles downstream of the project site, and Lady Island, about 12.5 miles upstream. This distance encompasses the lower Columbia River from approximately RM 101 to 119. As no pile driving activities will occur within North Portland Harbor, there will be no aquatic effects from underwater pile driving noise in this area.

Sixteen ESA-listed species and 12 designated critical habitats occur in the action area and were considered in this opinion (Table 8). Southern resident killer whales do not occur in this action area but were nonetheless considered in this Opinion because Chinook salmon is the preferred

[2] One measurement of 136 dB peak has been reported for the lower Columbia River at RM 45 where the river is tidally influenced (Carlson *et al.* 2001, cited in the BA). A crude approximation of the root mean square (RMS) values is approximately 121 dB RMS (subtracting 15 dB, Jim Laughlin 2009, personal communication).

prey of southern resident killer whales and a reduction in Chinook salmon could reduce the available quantity of that prey within the range of the killer whale. For reasons explained in Appendix A of this Opinion, NMFS concluded that the proposed action is not likely to adversely affect southern resident killer whales.

The action area is also designated as EFH for Pacific Coast groundfish (PFMC 2006), coastal pelagic species (PFMC 1998), and Pacific Coast salmon (PFMC 1999), or is in an area where environmental effects of the proposed action may adversely affect designated EFH for those species.

Table 8. Federal Register notices for final rules that list threatened and endangered species, designate critical habitats, or apply protective regulations to listed species considered in this consultation. Listing status: T means listed as threatened under the ESA; E means listed as endangered.

Species	Listing Status	Critical Habitat	Protective Regulations
Marine and Anadromous Fish			
Chinook salmon (*Oncorhynchus tshawytscha*)			
Lower Columbia River	T 6/28/05; 70 FR 37160	9/02/05; 70 FR 52630	6/28/05; 70 FR 37160
Upper Willamette River	T 6/28/05; 70 FR 37160	9/02/05; 70 FR 52630	6/28/05; 70 FR 37160
Upper Columbia River spring-run	E 6/28/05; 70 FR 37160	9/02/05; 70 FR 52630	ESA section 9 applies
Snake River spring/summer run	T 6/28/05; 70 FR 37160	10/25/99; 64 FR 57399	6/28/05; 70 FR 37160
Snake River fall-run	T 6/28/05; 70 FR 37160	12/28/93; 58 FR 68543	6/28/05; 70 FR 37160
Chum salmon *(O. keta*)			
Columbia River	T 6/28/05; 70 FR 37160	9/02/05; 70 FR 52630	6/28/05; 70 FR 37160
Coho salmon (*O. kisutch*)			
Lower Columbia River	T 6/28/05; 70 FR 37160	Not applicable	6/28/05; 70 FR 37160
Sockeye salmon (*O. nerka*)			
Snake River	E 6/28/05; 70 FR 37160	12/28/93; 58 FR 68543	ESA section 9 applies
Steelhead (*O. mykiss*)			
Lower Columbia River	T 1/05/06; 71 FR 834	9/02/05; 70 FR 52630	6/28/05; 70 FR 37160
Upper Willamette River	T 1/05/06; 71 FR 834	9/02/05; 70 FR 52630	6/28/05; 70 FR 37160
Middle Columbia River	T 1/05/06; 71 FR 834	9/02/05; 70 FR 52630	6/28/05; 70 FR 37160
Upper Columbia River	T 1/05/06; 71 FR 834	9/02/05; 70 FR 52630	2/01/06; 71 FR 5178
Snake River Basin	T 1/05/06; 71 FR 834	9/02/05; 70 FR 52630	6/28/05; 70 FR 37160
Green sturgeon (*Acipenser medirostris)*			
Southern	T 4/07/06; 71 FR 17757	10/09/09; 74 FR 52300	6/02/10; 75 FR 30714
Eulachon (*Thaleichthys pacificus*)			
Eulachon	T 3/18/10; 75 FR 13012	01-05-2011; 76 FR 515	Not applicable
Marine Mammals			
Steller sea lion (*Eumetopias jubatus*)			
Eastern	T 5/5/1997; 63 FR 24345	8/ 27/93; 58 FR 45269	11/26/90; 55 FR 49204
Killer whale (*Orcinus orca*)			
Southern Resident	E 11/18/05; 70 FR 69903	11/29/06; 71 FR 69054	ESA section 9 applies

ENDANGERED SPECIES ACT BIOLOGICAL OPINION

Section 7(a)(2) of the ESA requires Federal FHWA and FTA to consult with NMFS to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. The Opinion that follows records the results of the interagency consultation for this proposed action. The ITS provided after the Opinion specifies the impact of taking of threatened or endangered species that will be incidental to the proposed action; reasonable and prudent measures that NMFS considers necessary and appropriate to minimize such impact, and nondiscretionary terms and conditions (including, but not limited to, reporting requirements) that must be complied with by the FHWA and FTA to carry out the reasonable and prudent measures.

To complete the jeopardy analysis presented in this Opinion, NMFS reviewed the status of each listed species[3] considered in this consultation, the environmental baseline in the action area, the effects of the action, and cumulative effects (50 CFR 402.14(g)). From this analysis, NMFS determined whether effects of the action were likely, in view of existing risks, to appreciably reduce the likelihood of both the survival and recovery of the affected listed species.

For the critical habitat adverse modification analysis, NMFS considered the status of the entire designated area of the critical habitat considered in this consultation, the environmental baseline in the action area, the likely effects of the action on the function and conservation role of the affected critical habitat, and cumulative effects. NMFS used this assessment to determine whether, with implementation of the proposed action, critical habitat would remain functional, or retain the current ability for the primary constituent elements (PCE) to become functionally established, to serve the intended conservation role for the species.[4]

If the action under consultation is likely to jeopardize the continued existence of an ESA-listed species, or destroy or adversely modify critical habitat, NMFS must identify any reasonable and prudent alternatives for the action that avoid jeopardy or destruction or adverse modification of critical habitat and meet other regulatory requirements (50 CFR 402.02).

Status of the Species and Critical Habitat

The summaries that follow describe the status of ESA-listed species, their designated critical habitats, southern green sturgeon and eastern Steller sea lions that occur within the geographic area of the action area affected by the FHWA and FTA. These summaries are a synthesis of information presented across a large body of scientific publications and reports, and are the basis for the analyses we present in the Effects of the Action section of this Opinion. More detailed

[3] An "evolutionarily significant unit" (ESU) of Pacific salmon (Waples 1991) and a "distinct population segment" (DPS) (Policy Regarding the Recognition of District Vertebrate Population; 61 FR 4721, Feb 7, 1996) are both "species" as defined in section 3 of the ESA.

[4] Memorandum from William T. Hogarth to Regional Administrators, Office of Protected Resources, NMFS (November 7, 2005) (Application of the "Destruction or Adverse Modification" Standard Under Section 7(a)(2) of the Endangered Species Act).

information on the status and trends of these listed resources, and their biology and ecology, occur in the listing regulations and critical habitat designations published in the Federal Register (Table 8) and in many publications available from the NMFS Northwest Region, Protected Resources Division, Portland, Oregon.

The status of species and critical habitat sections below are organized into two recovery domains (Table 9) to better integrate recovery-planning information that NMFS is developing on the conservation status of the species and critical habitats considered in this consultation. Recovery domains are the geographically based areas that NMFS is using to prepare multi-species recovery plans.

Although southern green sturgeon, eulachon and eastern Steller sea lion are not part of this recovery domain structure, they are presented here for convenience as part of the Willamette/Lower Columbia Recovery Domain. Southern green sturgeon are under the jurisdiction of NMFS' Southwest Region, which has not yet convened a recovery team for this species. Nor has a recovery team yet been convened for eulachon, a species under the jurisdiction of NMFS' Northwest Region. The Steller sea lion recovery plan is under the jurisdiction of NMFS' Protected Resources Division, Silver Springs, Maryland (NMFS 2008c).

Table 9. Recovery planning domains identified by NMFS and the ESA-listed species considered in this consultation.

Recovery Domain	Species
Willamette-Lower Columbia	LCR Chinook salmon
	UWR Chinook salmon
	CR chum salmon
	LCR coho salmon
	LCR steelhead
	UWR steelhead
	Southern green sturgeon
	Eulachon
	Eastern Steller sea lion
Interior Columbia	UCR spring-run Chinook salmon
	SR spring/summer Chinook salmon
	SR fall-run Chinook salmon
	SR sockeye salmon
	UCR steelhead
	MCR steelhead
	SRB steelhead

For each recovery domain, a technical review team (TRT) appointed by NMFS has developed, or is developing, criteria necessary to identify independent populations within each species, recommend viability criteria for that species, and analyze factors that limit species survival. The definition of a population used by each TRT to analyze Pacific salmon and steelhead is set forth in the viable salmonid population (VSP) document prepared by NMFS for use in conservation assessments of Pacific salmon and steelhead (McElhany *et al.* 2000). The boundaries of each

population are defined using a combination of genetic information, geography, life-history traits, morphological traits, and population dynamics that indicate the extent of reproductive isolation among spawning groups. To-date, the TRT have divided the 13 species of Pacific salmon and steelhead considered in this Opinion into 189 populations. The overall viability of a species is a function of the VSP attributes of its constituent populations. Those attributes are abundance, population growth rate, population spatial structure, and diversity. Until a viability analysis of a species is completed, the VSP guidelines recommend that all populations should be managed to retain the potential to achieve viable status to ensure a rapid start along the road to recovery, and that no significant parts of the species are lost before the full recovery plan is implemented (McElhany *et al.* 2000).

The status of critical habitat was based primarily on a watershed-level analysis of conservation value that focused on the presence of listed ESA-listed species and physical features (*i.e.*, the PCEs) that are essential to their conservation. This analysis for the 2005 designations of Pacific salmon and steelhead species was completed by Critical Habitat Analytical Review Teams (CHARTs) that focused on large geographical areas corresponding approximately to recovery domains (NOAA Fisheries 2005). Each watershed was ranked using a conservation value attributed to the quantity of stream habitat with PCEs, the present condition of those PCEs, the likelihood of achieving PCE potential (either naturally or through active restoration), support for rare or important genetic or life history characteristics, support for abundant populations, and support for spawning and rearing populations. In some cases, our understanding of these interim conservation values has been further refined by the work of TRTs and other recovery planning efforts that have better explained the habitat attributes, ecological interactions, and population characteristics important to each species.

A similar team, referred to as a Critical Habitat Review Team (CHRT) was convened for southern green sturgeon, as reported in the proposed rule. That team identified and analyzed the conservation value of particular areas occupied by southern green sturgeon, and unoccupied areas they felt may be necessary to ensure the conservation of the species. The CHRT did not identify those particular areas using HUC nomenclature, but did provide geographic place names for those areas, including the names of freshwater rivers, the bypasses, the Sacramento-San Joaquin Delta, coastal bays and estuaries, and coastal marine areas (within 110-meter depth) extending from the California/Mexico border north to Monterey Bay, California, and from the Alaska/Canada border northwest to the Bering Strait; and certain coastal bays and estuaries in California, Oregon, and Washington.

Status of the Species

Natural variations in freshwater and marine environments have substantial effects to the abundance of salmon, steelhead, southern green sturgeon, eulachon, and eastern Steller sea lion populations. Of the various natural phenomena that affect most populations of Pacific salmon and steelhead, changes in ocean productivity are generally considered the most important. Pacific salmon and steelhead are exposed to high rates of natural predation, particularly during freshwater rearing and migration stages. Ocean predation probably contributes to significant

natural mortality, although the levels of predation are largely unknown. In general, Pacific salmon and steelhead are eaten by pelagic fishes, birds, and marine mammals.

Over the past few decades, the sizes and distributions of the Pacific salmon and steelhead populations considered in this Opinion, like the other salmon and steelhead species that NMFS has listed, generally have declined because of natural phenomena and human activity, including the operation of hydropower systems, over-harvest, hatcheries, and habitat degradation. Enlarged populations of terns, seals, sea lions, and other aquatic predators in the Pacific Northwest were identified as factors that may be limiting the productivity of some Pacific salmon and steelhead populations (Bottom *et al.* 2005, Fresh *et al.* 2005). It is also likely that climate change will play an increasingly important role in determining the abundance of Pacific salmon and steelhead by exacerbating long-term problems related to temperature, stream flow, habitat access, predation, and marine productivity (CIG 2004, Scheuerell and Williams 2005, Zabel *et al.* 2006, ISAB 2007).

Willamette and Lower Columbia (WLC) Recovery Domain. Species in the WLC recovery domain include LCR Chinook, UWR Chinook, CR chum, LCR coho, LCR steelhead, and UWR steelhead, southern green sturgeon, and eulachon. Although the WLC-TRT has not yet addressed southern green sturgeon or eulachon, it has identified 107 demographically-independent populations of Pacific salmon and steelhead (Table 10). These populations were further aggregated into strata, groupings above the population level that are connected by some degree of migration, based on ecological subregions. All 107 populations use parts of the mainstem of the lower Columbia River and the Columbia River estuary for migration, rearing, and smoltification.

McElhany *et al.* (2007) found that, for populations in Oregon, the combined extinction risk is very high for LCR Chinook, UWR Chinook salmon, CR chum salmon, LCR coho salmon, and moderate for LCR steelhead and UWR steelhead, although the status of those species with populations in Washington is still under assessment.

Table 10. Demographically-independent populations in the WLC recovery domain.

Species	Populations	Combined Extinction Risk
LCR Chinook salmon	32	Very High
UWR Chinook salmon	7	Very High
CR chum salmon	17	Very High
LCR coho salmon	24	Very High
LCR steelhead	23	Moderate
UWR steelhead	4	Moderate

LCR Chinook salmon. This species includes all naturally-spawned populations of Chinook salmon in the Columbia River and its tributaries from its mouth at the Pacific Ocean upstream to a transitional point between Washington and Oregon east of the Hood River and the White Salmon River; the Willamette River to Willamette Falls, Oregon, exclusive of spring-run

Chinook salmon in the Clackamas River; and progeny of seventeen artificial propagation programs. The WLC-TRT identified 22 historical populations of LCR Chinook salmon – seven in the coastal subregion, six in the Columbia Gorge, and nine in the western Cascades. Twelve of those populations occur within the action area (Table 11) and only Sandy River late fall Chinook is considered viable (McElhany *et al.* 2007).

The major factors limiting recovery of LCR Chinook salmon include altered channel morphology, loss of habitat diversity, excessive sediment, high water temperature, reduced access to spawning/rearing habitat, and harvest impacts (NMFS 2006).

Table 11. LCR Chinook salmon populations.

Stratum		Spawning Population (Watershed)
Ecological Subregion	Run Timing	
Coast Range	Fall	Young Bay
		Grays River
		Big Creek
		Elochman River
		Clatskanie River
		Mill Creek
		Scappoose River
Columbia Gorge	Spring	Upper Cowlitz River
		Cispus River
		Tilton River
		Big White Salmon River
		Hood River
	Early Fall (tule)	Upper Gorge Tributaries
		Big White Salmon River
	Fall	Upper Cowlitz River
		Lower Cowlitz River
		Coweeman River
		Toutle River
		Lower Gorge Tributaries
		Hood River
Western Cascade Range	Spring	Toutle River
		Kalama River
		Lewis River
		Sandy River
	Early Fall (tule)	Lewis River
		Salmon Creek
		Sandy River
	Fall	Kalama River
		Clackamas River
		Washougal River
	Late Fall (bright)	Lewis River
		Sandy River

UWR Chinook salmon. The species includes all naturally spawned populations of spring-run Chinook salmon in the Clackamas River and in the Willamette River, and its tributaries, above Willamette Falls, Oregon, and progeny of seven artificial propagation programs. All seven historical populations of UWR Chinook salmon identified by the WLC-TRT occur within the action area and are contained within a single ecological subregion, the western Cascade Range (Table 12); only the Clackamas population is characterized as viable (McElhany *et al.* 2007).

The major factors limiting recovery of UWR Chinook salmon identified by NMFS include lost/degraded floodplain connectivity and lowland stream habitat, degraded water quality, high water temperature, reduced streamflow, and reduced access to spawning/rearing habitat (NMFS 2006).

Table 12. UWR Chinook salmon populations. Overall viability risk: extinct or very high means greater than 60% chance of extinction within 100 years; relatively high means 60 to 25% risk of extinction in 100 years; moderate means 25 to 5% risk of extinction in 100 years, low or negligible means 5 to 1% risk of extinction in 100 years; very low means less than 1% chance of extinction in 100 years, and NA means not available. A low or negligible risk of extinction is considered viable.

Stratum		Spawning Population (Watershed)	Overall Viability Risk
Ecological Subregion	Run Timing		
Western Cascade Range	Spring	Clackamas	Low
		Molalla	Relatively High
		North Santiam	Very high
		South Santiam	Very high
		Calapooia	Very high
		McKenzie	Moderate
		Middle Fork Willamette	Very high

CR chum salmon. This species includes all naturally-spawned populations of chum salmon in the Columbia River and its tributaries in Washington and Oregon, and progeny of three artificial propagation programs. The WLC-TRT identified 17 historical populations of CR chum salmon and aggregated these into four strata (Myers *et al.* 2006). Unlike other species in the WLC recovery domain, CR chum salmon spawning aggregations were identified in the mainstem Columbia River. These aggregations generally were included in the population associated with the nearest river basin. Three strata and eight historical populations of CR chum salmon occur within the action area (Table 13); of these, none are viable (McElhany *et al.* 2007).

The major factors limiting recovery of CR chum salmon include altered channel morphology, loss of habitat diversity, excessive sediment, reduced streamflow, harassment of spawners, and harvest impacts (NMFS 2006).

Table 13. CR chum salmon populations.

Stratum		Spawning Population (Watershed)
Ecological Subregion	Run Timing	
Coast Range	Fall	Young's Bay
		Grays River
		Big Creek
		Elochman River
		Clatskanie River
		Mill Creek
		Scappoose Creek
Columbia Gorge	Summer	Cowlitz River
	Fall	Cowlitz River
		Lower Gorge Tributaries
		Upper Gorge Tributaries
Western Cascade Range	Fall	Kalama River
		Salmon Creek
		Lewis River
		Clackamas River
		Washougal River
		Sandy River

LCR coho salmon. This species includes all naturally-spawned populations of coho salmon in the Columbia River and its tributaries in Washington and Oregon, from the mouth of the Columbia up to and including the Big White Salmon and Hood rivers; in the Willamette River to Willamette Falls, Oregon; and progeny of 25 artificial propagation programs. The WLC-TRT identified 24 historical populations of LCR coho salmon and divided these into two strata based on major run timing: early and late (Myers *et al.* 2006). Three strata and nine historical populations of LCR coho salmon occur within the action area (Table 14). Of these nine populations, Clackamas River is the only population characterized as viable (McElhany *et al.* 2007).

In general, late coho salmon spawn in smaller rivers or the lower reaches of larger rivers from mid-November to January, coincident with the onset of rain-induced freshets in the fall or early winter. Spawning typically takes place within a few days to a few weeks of freshwater entry. Late-run fish also tend to undertake oceanic migrations to the north of the Columbia River, extending as far as northern British Columbia and southeast Alaska. As a result, late coho salmon are known as Type N coho. Alternatively, early coho salmon spawn in the upper reaches of larger rivers in the lower Columbia River and in most rivers inland of the Cascade Crest. During their oceanic migration, early coho salmon tend to migrate to the south of the Columbia River and are known as Type S coho salmon. They may migrate as far south as the waters off northern California. While the ecological significance of run timing in coho salmon is fairly well understood, it is not clear how important ocean migratory pattern is to overall diversity and the relative historical abundance of Type N and Type S life histories largely is unknown.

The major factors limiting recovery of LCR coho salmon include degraded floodplain connectivity and channel structure and complexity, loss of riparian areas and large wood

recruitment, degraded stream substrate, loss of stream flow, reduced water quality, and impaired passage (NMFS 2007).

Table 14. LCR coho salmon spawning populations.

Stratum		Spawning Population (Watershed)
Ecological Subregion	Run Type	
Coast Range	N	Young's Bay
		Grays River
		Big Creek
		Elochman Creek
		Clatskanie River
		Mill, Germany, Abernathy Creeks
		Scappoose River
Columbia Gorge	N	Lower Gorge Tributaries
	S	Upper Gorge Tributaries
		Big White Salmon River
		Hood River
Western Cascade Range	N	Lower Cowlitz River
		Coweeman River
		Salmon Creek
	N and S	Cispus River
		Upper Cowlitz River
		Tilton River
		North Fork Toutle River
		South Fork Toutle River
		Kalama River
		North Fork Lewis River
		East Fork Lewis River
		Clackamas River
		Washougal River
		Sandy River

LCR steelhead. The species includes all naturally-spawned steelhead populations below natural and manmade impassable barriers in streams and tributaries to the Columbia River between and including the Cowlitz and Wind rivers, Washington; in the Willamette and Hood rivers, Oregon; and progeny of ten artificial propagation programs; but excluding all steelhead from the upper Willamette River basin above Willamette Falls, Oregon, and from the Little and Big White Salmon rivers, Washington. The WLC-TRT identified 23 historical populations of LCR steelhead (Myers *et al.* 2006). Within these populations, the winter-run timing is more common in the west Cascade subregion, while farther east summer steelhead are found almost exclusively.

Summer steelhead return to freshwater long before spawning. Winter steelhead, in contrast, return from the ocean much closer to maturity and spawn within a few weeks. Summer steelhead spawning areas in the lower Columbia River are found above waterfalls and other features that

create seasonal barriers to migration. Where no temporal barriers exist, the winter-run life history dominates. Six strata and 23 historical populations of LCR steelhead occur within the action area (Table 15).

The major factors limiting recovery of LCR steelhead include altered channel morphology, lost/degraded floodplain connectivity and lowland stream habitat, excessive sediment, high water temperature, reduced streamflow, and reduced access to spawning/rearing habitat (NMFS 2006).

Table 15. LCR steelhead populations spawning.

Stratum		Population (Watershed)
Ecological Subregion	Run Timing	
Columbia Gorge	Summer	Wind River
		Hood River
	Winter	Lower Gorge Tributaries
		Upper Gorge Tributaries
		Hood River
West Cascade Range	Summer	Kalama River
		North Fork Lewis River
		East Fork Lewis River
		Washougal River
	Winter	Cispus River
		Tilton river
		Upper Cowlitz River
		Lower Cowlitz River
		North Fork Toutle River
		South Fork Toutle River
		Coweeman River
		Kalama River
		North Fork Lewis River
		East Fork Lewis River
		Clackamas River
		Salmon Creek
		Sandy River
		Washougal River

UWR steelhead. This species includes all naturally-spawned steelhead populations below natural and manmade impassable barriers in the Willamette River, Oregon, and its tributaries upstream from Willamette Falls to the Calapooia River. The WLC-TRT identified five historical populations of UWR steelhead, all with winter run timing (Myers *et al.* 2006). Only winter steelhead historically existed in this area because flow conditions over Willamette Falls allowed only late winter steelhead to ascend the falls, until a fish ladder was constructed in the early 1900s and summer steelhead were introduced. Summer steelhead have become established in the McKenzie River where historically no steelhead existed, although these fish were not considered in the identification of historical populations. UWR steelhead are currently found in many tributaries that drain the west side of the upper Willamette River basin. Analysis of historical

observations, hatchery records, and genetic analysis strongly suggested that many of these spawning aggregations are the result of recent introductions and do not represent a historical population. Nevertheless, the WLC-TRT recognized that these tributaries may provide juvenile rearing habitat or may be temporarily (for one or more generations) colonized during periods of high abundance.

One stratum and five historical populations of UWR steelhead occur within the action area (Table 16), although the west-side tributaries population was included only because it is important to the species as a whole, and not because it is independent. Of these five populations, none are viable (McElhany *et al.* 2007).

The major factors limiting recovery of UWR steelhead include lost/degraded floodplain connectivity and lowland stream habitat, degraded water quality, high water temperature, reduced streamflow, and reduced access to spawning/rearing habitat (NMFS 2006).

Table 16. UWR steelhead populations. Overall viability risk: extinct or very high means greater than 60% chance of extinction within 100 years; relatively high means 60 to 25% risk of extinction in 100 years; moderate means 25 to 5% risk of extinction in 100 years, low or negligible means 5 to 1% risk of extinction in 100 years; very low means less than 1% chance of extinction in 100 years, and NA means not available. A low or negligible risk of extinction is considered viable.

Stratum		Population Spawning (Watershed)	Overall Viability Risk
Ecological Subregion	Run Type		
West Cascade Range	Winter	Molalla	Moderate
		North Santiam	Moderate
		South Santiam	Moderate
		Calapooia	Moderate
		West-side Tributaries	Moderate

Southern green sturgeon. Southern green sturgeon includes all naturally-spawned populations of green sturgeon that occur south of the Eel River in Humboldt County, California. When not spawning, this anadromous species is broadly distributed in nearshore marine areas from Mexico to the Bering Sea. Although it is commonly observed in bays, estuaries, and sometimes the deep riverine mainstem in lower elevation reaches of non-natal rivers along the west coast of North America, the distribution and timing of estuarine use are poorly understood.

The principal factor for the decline of southern green sturgeon is the reduction of its spawning area to a single known population limited to a small portion of the Sacramento River. Other factors include degradation of freshwater and estuarine habitat quality, water diversions, and fishing. The viability of this species is still under assessment. Southern green sturgeon occur in three recovery domains: Puget Sound (although this area was excluded from proposed critical habitat), the Willamette and Lower Columbia, Oregon Coast, and Southern Oregon/Northern California Coasts.

Eulachon. The ESA-listed population of eulachon includes all naturally spawned populations that occur in rivers south of the Nass River in British Columbia to the Mad River in California. Core populations for this species include the Fraser River, Columbia River and (historically) the Klamath River. The most significant factor responsible for the decline of eulachon is change in ocean conditions due to climate change (EBRT 2010). Other factors include many adverse effects related to dams and water diversions, artificial fish passage barriers, increased water temperatures, insufficient streamflow, altered sediment balances, water pollution, over-harvest, and predation.

The viability of this species is under assessment although abrupt and continuing declines in abundance throughout its range and the added vulnerability that a small population size presents for this type of highly fecund, broadcast spawning species are of particular concern. Eulachon occur in four recovery domains: Puget Sound, the Willamette and Lower Columbia, Oregon Coast, and Southern Oregon/Northern California Coasts. Within the Columbia River, major tributaries that support spawning runs include the Grays, Skamokawa, Elochoman, Kalama, Lewis and Sandy rivers. In the early 1990's, there was an abrupt decline in the abundance of Eulachon returning to the Columbia River with no evidence of returning to their former population levels since then (Drake *et al.* 2008).

Of the four components of species viability criteria, abundance of the southern Eulachon has declined in the Columbia River to historic low levels, productivity is of concern due to climate change, diversity is limited to a single age class, and spatial structure is declining as runs sizes dwindle throughout their range (Drake *et al.* 2008). Based on these factors, the Biological Review Team (BRT) determined that the southern Eulachon was at moderate risk of extinction (Drake *et al.* 2008).

Eastern Steller sea lion. The eastern Steller sea lion ranges from southeast Alaska to southern California with a minimum abundance of 44,404 animals (NMFS 2009a), and has increased at 3% per year for the past 30 years (NMFS 2008c). The greatest increases have occurred in southeast Alaska and British Columbia (together accounting for 82% of pup production), but performance has remained poor in California at the southern extent of their range. In Southeast Alaska, British Columbia and Oregon, the number of Steller sea lions has more than doubled since the 1970s. There are no substantial threats to the species, and the population continues to increase at approximately 3% per year. The final Steller sea lion recovery plan identifies the need to initiate a status review for the eastern Steller sea lion and consider removing it from the Federal List of Endangered Wildlife and Plants (NMFS 2008c). The eastern Steller sea lions breeds on rookeries located in southeast Alaska, British Columbia, Oregon, and California; there are no rookeries located in Washington. Haulouts are located throughout the eastern population's range (NMFS 2008c).

Steller sea lions are generalist predators, able to respond to changes in prey abundance. Their primary prey includes a variety of fishes and cephalopods. Some prey species are eaten seasonally when locally available or abundant, and other species are available and eaten year-round (review in NMFS 2008c). Pacific hake appears to be the primary prey item across the

range of eastern Steller sea lion (NMFS 2008c). Other prey items include Pacific cod, walleye Pollock, salmon, and herring, among other species.

Interior Columbia (IC) Recovery Domain. Species in the IC recovery domain include UCR spring-run Chinook salmon, SR spring/summer run Chinook salmon, SR fall-run Chinook salmon, SR sockeye salmon, UCR steelhead, MCR steelhead, and SRB steelhead. The IC-TRT identified 82 demographically-independent populations of those species based on genetic, geographic (hydrographic), and habitat characteristics (Table 17). In some cases, the IC-TRT further aggregated populations into major groupings based on dispersal distance and rate, and drainage structure, primarily the location and distribution of large tributaries (IC-TRT 2003). All 82 populations identified use the lower mainstem of the Snake River, the mainstem of the Columbia River, and the Columbia River estuary, or part thereof, for migration, rearing, and smoltification.

Table 17. Demographically-independent populations of ESA-listed Pacific salmon and steelhead in the IC recovery domain.

Species	Populations
UCR spring-run Chinook salmon	3
SR spring/summer Chinook salmon	31
SR fall-run Chinook salmon	1
SR sockeye salmon	1
UCR steelhead	4
MCR steelhead	17
SRB steelhead	25

The IC-TRT also recommended viability criteria that follow the VSP framework (McElhany *et al.* 2006) and described biological or physical performance conditions that, when met, indicate a population or species has a 5% or less risk of extinction over a 100-year period (IC-TRT 2007, see also NRC 1995). As of this writing, the IC-TRT has applied the viability criteria to 68 populations, although it has only completed a draft assessment for 55 populations (IC-TRT 2006). Of those assessments, the only population that the TRT found to be viable was the North Fork John Day population of MCR steelhead. The strength of this population is due to a combination of high abundance and productivity, and good spatial structure and diversity, although the genetic effects of the large number of out-of-species strays and of natural spawners that are hatchery strays are still significant long-term concerns.

UCR spring-run Chinook salmon. This species includes all naturally-spawned populations of Chinook salmon in all river reaches accessible to Chinook salmon in Columbia River tributaries upstream of the Rock Island Dam and downstream of Chief Joseph Dam in Washington (excluding the Okanogan River), the Columbia River from a straight line connecting the west end of the Clatsop jetty (south jetty, Oregon side) and the west end of the Peacock jetty (north jetty, Washington side) upstream to Chief Joseph Dam in Washington, and progeny of six artificial propagation programs. The IC-TRT identified four independent populations of UCR spring-run Chinook salmon in the upriver tributaries of Wenatchee, Entiat, Methow, and

Okanogan (extirpated), but no major groups due to the relatively small geographic area affected (IC-TRT 2003, McClure *et al.* 2005). The IC-TRT considered that this species is at high risk of extinction because all extant populations are at high risk (IC-TRT 2006).

The major factors limiting recovery of UWR spring-run Chinook salmon include altered channel morphology and flood plain, riparian degradation and loss of in-river large wood, reduced streamflow, impaired passage, hydropower system mortality, and harvest impacts (NMFS 2006).

SR spring/summer run Chinook salmon. This species includes all naturally-spawned populations of spring/summer run Chinook salmon in the mainstem Snake River and the Tucannon River, Grande Ronde River, Imnaha River, and Salmon River sub-basins; and progeny of fifteen artificial propagation programs. The IC-TRT identified 31 historical populations of SR spring/summer run Chinook salmon, and aggregated these into major population groups (Table 18) (IC-TRT 2003, McClure *et al.* 2005). This species includes those fish that spawn in the Snake River drainage and its major tributaries, including the Grande Ronde River and the Salmon River, and that complete their adult, upstream migration past Bonneville Dam between March and July. Each of these populations are part of the Grande Ronde and Imnaha River major group, and all face a high risk of extinction (IC-TRT 2006).

The major factors limiting recovery of SR spring/summer run Chinook salmon include altered channel morphology and flood plain, excessive sediment, degraded water quality, reduced streamflow, and hydropower system mortality (NMFS 2006).

Table 18. SR spring/summer run Chinook salmon populations.

Major Group	Spawning Populations (Watershed)	Major Group	Spawning Populations (Watershed)
Lower Snake River	Tucannon River	Middle Fork Salmon River (continued)	Camas Creek
	Asotin River		Loon Creek
Grande Ronde and Imnaha rivers	Wenaha River		Pistol Creek
	Wallowa-Lostine River		Sulphur Creek
	Minam River		Bear Valley Creek
	Catherine Creek		March Creek
	Upper Grande Ronde		U. Middle Fork main
	Imnaha River mainstem	Upper Mainstem Salmon	N. Fork Salmon River
	Big Sheep Creek		Lemhi River
Looking-glass Creek			Pahsimeroi River
Little Salmon	Little Salmon River		Upper Salmon l. main
South Fork Salmon River	South Fork Main Stem		East Fork Salmon River
	Secesh River		Yankee Fork
	East Fork South Fork		Valley Creek
Chamberlin Creek			Upper Salmon main
Middle Fork Salmon River	Big Creek	Panther Creek	
	L. Middle Fork main		

SR fall-run Chinook salmon. This species includes all naturally-spawned populations of fall-run Chinook salmon in the mainstem Snake River below Hells Canyon Dam, and in the Tucannon River, Grande Ronde River, Imnaha River, Salmon River, and Clearwater River, and progeny of four artificial propagation programs. The IC-TRT identified three populations of this species, although only the lower mainstem population exists at present, and it spawns in the lower main stem of the Clearwater, Imnaha, Grande Ronde, Salmon and Tucannon rivers (IC-TRT 2003, McClure *et al.* 2005). Unlike the other listed Chinook species in this recovery domain, most SR fall-run Chinook have a subyearling, ocean-type life history in which juveniles out-migrate the next summer, rather than rearing in freshwater for 13 to 14 months before outmigration. The IC-TRT has not completed a viability assessment of this species.

The major factors limiting recovery of SR fall-run Chinook salmon include reduced spawning/rearing habitat, degraded water quality, hydropower system mortality, and harvest impacts (NMFS 2006).

SR sockeye salmon. This species includes all anadromous and residual sockeye salmon from the Snake River basin, Idaho, and artificially-propagated sockeye salmon from the Redfish Lake captive propagation program. The IC-TRT identified historical sockeye production in at least five Stanley Basin lakes and in lake systems associated with Snake River tributaries currently cut off to anadromous access (*e.g.,* Wallowa and Payette Lakes), although current returns of SR sockeye are extremely low and limited to Redfish Lake (IC-TRT 2007).

The major factors limiting recovery of SR sockeye salmon include altered channel morphology and flood plain, reduced streamflow, impaired passage, and hydropower system mortality (NMFS 2006).

MCR steelhead. This species includes all naturally-spawned steelhead populations below natural and artificial impassable barriers in streams from above the Wind River, Washington, and the Hood River, Oregon (exclusive), upstream to, and including, the Yakima River, Washington, excluding steelhead from the Snake River basin; and progeny of seven artificial propagation programs. The IC-TRT identified 20 historical populations of MCR steelhead in five major groups (Table 19) (IC-TRT 2003, McClure *et al.* 2005).

The major factors limiting recovery of MCR steelhead include altered channel morphology and flood plain, excessive sediment, degraded water quality, reduced streamflow, impaired passage, and hydropower system mortality (NMFS 2006).

Table 19. MCR steelhead populations.

Major Group	Population (Watershed)
Cascade Eastern Slope Tributaries	Klickitat River
	Fifteenmile Creek
	Deschutes River Eastside Tributaries
	Deschutes River Westside Tributaries
	White Salmon (access blocked above Condit Dam)
	Deschutes (extirpated above Pelton Dam)
	Crooked River (extirpated)
John Day River	Lower Mainstem John Day River
	North Fork John Day River
	Middle Fork John Day River
	South Fork John Day River
	Upper Mainstem John Day River
	Willow Creek (extirpated)
Rock Creek	Rock Creek
Walla Walla and Umatilla rivers	Umatilla River
	Walla Walla River
	Touchet River
Yakima River	Satus Creek
	Toppenish Creek
	Naches River
	Upper Yakima

UCB steelhead. This species includes all naturally-spawned steelhead populations below natural and manmade impassable barriers in streams in the Columbia River basin upstream from the Yakima River, Washington, to the U.S.-Canada border, and progeny of six artificial propagation programs. Four independent populations of UCR steelhead were identified by the IC-TRT in the same upriver tributaries as for the previous species (*i.e.*, Wenatchee, Entiat, Methow, and Okanogan) and, similarly, no major population groupings were identified due to

the relatively small geographic area involved (IC-TRT 2003, McClure *et al.* 2005). The IC-TRT has not completed a viability assessment of this species, although all extant populations are considered to be at high risk of extinction (IC-TRT 2006).

The major factors limiting recovery of UCR steelhead include altered channel morphology and flood plain, riparian degradation and loss of in-river large wood, excessive sediment, degraded water quality, reduced streamflow, hydropower system mortality, harvest impacts, and hatchery impacts (NMFS 2006).

SRB steelhead. This species includes all naturally-spawned steelhead populations below natural and manmade impassable barriers in streams in the Snake River basin of southeast Washington, northeast Oregon, and Idaho, and progeny of six artificial propagation programs. These fish are genetically differentiated from other interior Columbia steelhead populations and spawn at higher altitudes (up to 6,500 feet) after longer migrations (more than 900 miles). The IC-TRT identified 25 historical populations in five major groups (Table 20) (IC-TRT 2003, McClure *et al.* 2005). The IC-TRT has not completed a viability assessment of this species. The major factors limiting recovery of SRB steelhead include altered channel morphology and flood plain, excessive sediment, degraded water quality, reduced streamflow, hydropower system mortality, harvest impacts, and hatchery impacts (NMFS 2006).

Table 20. SRB steelhead populations.

	Spawning Populations (Watershed)
Lower Snake River	Tucannon River
	Asotin River
Clearwater River	Lower Clearwater River
	S. Fork Clearwater
	Lolo Creek
	Selway Creek
	Lochsa River
	N. Fork Clearwater (extirpated)
Grande Ronde River	Lower Grande Ronde
	Joseph Creek
	Wallowa River
	Upper Grande Ronde
Salmon River	Little/Lower Salmon
	South Fork Salmon
	Secesh River
	Chamberlain Creek
	L. Middle Fork Salmon
	U. Middle Fork Salmon
	Panther Creek
	North Fork Salmon
	Lemhi River
	Pahsimeroi River
	East Fork Salmon
	Upper Main Salmon
Imnaha	Imnaha River
Hells Canyon	Hells Canyon Tributaries

Status of the Critical Habitats

NMFS designated critical habitat for all species considered in this Opinion, except LCR coho salmon, for which critical habitat is not proposed or designated, and eulachon, for which critical habitat is proposed but not yet designated; eastern Steller sea lion does not have critical habitat designated in the action area (Table 8). To assist in the designation of critical habitat for ESA-listed species of Pacific salmon and steelhead in 2005, NMFS convened Critical Habitat Analytical Review Teams, or CHARTs, organized by major geographic areas that roughly correspond to salmon recovery planning domain (NOAA Fisheries 2005). Each CHART consisted of Federal biologists and habitat specialists from NMFS, the U.S. Fish and Wildlife Service, the U.S. Forest Service, and the U.S. Bureau of Land Management, with demonstrated expertise regarding Pacific salmon and steelhead habitat and related protective efforts within that domain.

Each CHART assessed biological information pertaining to areas under consideration for designation as critical habitat to identify the areas occupied by listed Pacific salmon and steelhead, determine whether those areas contained PCEs essential for the conservation of those species, and whether unoccupied areas existed within the historical range of the listed Pacific salmon and steelhead that may also be essential for conservation. The CHART then scored each habitat area based on the quantity and quality of the physical and biological features; rated each habitat area as having a "high," "medium," or "low" conservation value; and identified management actions that could affect habitat for Pacific salmon and steelhead.

The ESA gives the Secretary of Commerce discretion to exclude areas from designation if he determines that the benefits of exclusion outweigh the benefits of designation. Considering economic factors and information from CHARTs, NMFS partially or completely excluded the following types of areas from the 2005 critical habitat designations:

1. Military areas. All military areas were excluded because of the current national priority on military readiness, and in recognition of conservation activities covered by military integrated natural resource management plans.

2. Tribal lands. Native American lands were excluded because of the unique trust relationship between tribes and the federal government, the federal emphasis on respect for tribal sovereignty and self governance, and the importance of tribal participation in numerous activities aimed at conserving salmon.

3. Areas With Habitat Conservation Plans. Some lands covered by habitat conservation plans were excluded because NMFS had evidence that exclusion would benefit our relationship with the landowner, the protections secured through these plans outweigh the protections that are likely through critical habitat designation, and exclusion of these lands may provide an incentive for other landowners to seek similar voluntary conservation plans.

4. Areas With Economic Impacts. Areas where the conservation benefit to the species would be relatively low compared to the economic impacts.

In designating these critical habitats, NMFS organized information at scale of the watershed or 5th field HUC because it corresponds to the spatial distribution and site fidelity scales of Pacific salmon and steelhead populations (WDF *et al.* 1992, McElhany *et al.* 2000). For earlier critical habitat designations for Snake River, similar information was not available at the watershed scale, so NMFS used the scale of the sub-basin or 4th field HUC to organize critical habitat information. For southern green sturgeon, the CHART identified and designated critical habitat as specific areas within freshwater rivers, the bypasses, the Sacramento-San Joaquin Delta, coastal bays and estuaries, and coastal marine areas
(within 110-meter depth).

NMFS reviews the status of designated critical habitat affected by the proposed action by examining the condition and trends of PCEs throughout the designated area. These PCEs vary

slightly for some species, due to biological and administrative reasons, but all consist of site types and site attributes associated with life history events (Tables 21 – 23).

Table 21. Primary constituent elements of critical habitats designated for ESA-listed salmon and steelhead species considered in the Opinion (except SR spring/summer run Chinook salmon, SR fall-run Chinook salmon, and SR sockeye salmon), and corresponding species life history events.

Primary Constituent Elements		**Species Life History Event**
Site Type	**Site Attribute**	
Freshwater spawning	Substrate Water quality Water quantity	Adult spawning Embryo incubation Alevin growth and development
Freshwater rearing	Floodplain connectivity Forage Natural cover Water quality Water quantity	Fry emergence from gravel Fry/parr/smolt growth and development
Freshwater migration	Free of artificial obstruction Natural cover Water quality Water quantity	Adult sexual maturation Adult upstream migration and holding Kelt (steelhead) seaward migration Fry/parr/smolt growth, development, and seaward migration
Estuarine areas	Forage Free of artificial obstruction Natural cover Salinity Water quality Water quantity	Adult sexual maturation and reverse smoltification Adult upstream migration and holding Kelt (steelhead) seaward migration Fry/parr/smolt growth, development, and seaward migration
Nearshore marine areas	Forage Free of artificial obstruction Natural cover Water quantity Water quality	Adult growth and sexual maturation Adult spawning migration Nearshore juvenile rearing
Offshore marine areas	Forage Water quality	Adult growth and sexual maturation Adult spawning migration Subadult rearing

Table 22. Primary constituent elements of critical habitats designated for SR spring/summer run Chinook salmon, SR fall-run Chinook salmon, SR sockeye salmon, and corresponding species life history events.

Primary Constituent Elements		**Species Life History Event**
Site	**Site Attribute**	
Spawning and juvenile rearing areas	Access (sockeye) Cover/shelter Food (juvenile rearing) Riparian vegetation Space (Chinook, coho) Spawning gravel Water quality Water temp (sockeye) Water quantity	Adult spawning Embryo incubation Alevin growth and development Fry emergence from gravel Fry/parr/smolt growth and development
Adult and juvenile migration corridors	Cover/shelter Food (juvenile) Riparian vegetation Safe passage Space Substrate Water quality Water quantity Water temperature Water velocity	Adult sexual maturation Adult upstream migration and holding Kelt (steelhead) seaward migration Fry/parr/smolt growth, development, and seaward migration
Areas for growth and development to adulthood	Ocean areas – not identified	Nearshore juvenile rearing Subadult rearing Adult growth and sexual maturation Adult spawning migration

Table 23. Primary constituent elements of critical habitat proposed for southern green sturgeon and corresponding species life history events.

Primary Constituent Elements		Life History Event
Site Type	**Site Attribute**	
Freshwater riverine system	Food resources Migratory corridor Sediment quality Substrate type or size Water Depth Water flow Water quality	Adult spawning Embryo incubation, growth and development Larval emergence, growth and development Juvenile metamorphosis, growth and development
Estuarine areas	Food resources Migratory corridor Sediment quality Water flow Water depth Water quality	Juvenile growth, development, seaward migration Subadult growth, development, seasonal holding, and movement between estuarine and marine areas Adult growth, development, seasonal holding, movements between estuarine and marine areas, upstream spawning movement, and seaward post-spawning movement
Coastal marine areas	Food resources Migratory corridor Water quality	Subadult growth and development, movement between estuarine and marine areas, and migration between marine areas Adult sexual maturation, growth and development, movements between estuarine and marine areas, migration between marine areas, and spawning migration

Climate change is likely to have negative implications for the conservation value of designated critical habitats in the Pacific Northwest (CIG 2004, Scheuerell and Williams 2005, Zabel *et al.* 2006, ISAB 2007). Average annual Northwest air temperatures have increased by approximately 1°C since 1900, or about 50% more than the global average warming over the same period (ISAB 2007). The latest climate models project a warming of 0.1 to 0.6^{o}C per decade over the next century. According to the ISAB, these effects may have the following physical impacts within the next 40 or so years:

- Warmer air temperatures will result in a shift to more winter/spring rain and runoff, rather than snow that is stored until the spring/summer melt season.
- With a shift to more rain and less snow, the snowpack will diminish in those areas that typically accumulate and store water until the spring freshet.
- With a smaller snowpack, these watersheds will see their runoff diminished and exhausted earlier in the season, resulting in lower stream flows in the June through September period.
- River flows in general and peak river flows are likely to increase during the winter due to more precipitation falling as rain rather than snow.

- Water temperatures will continue to rise, especially during the summer months when lower stream flows and warmer air temperatures will contribute to the warming regional waters.

These changes will not be spatially homogeneous across the entire Pacific Northwest. Sites with elevations high enough to maintain temperatures well below freezing for most of the winter and early spring would be less affected. Low-lying areas that historically have received scant precipitation are likely to be more affected. The ISAB (2007) also identified the likely effects of projected climate changes on Columbia River salmon and their habitat. These effects may include, but are not limited to, depletion of cold water habitat, variation in quality and quantity of tributary rearing habitat, alterations to migration patterns, accelerated embryo development, premature emergence of fry, and increased competition among species. Similar effects are likely to occur to some extent throughout the Pacific Northwest.

W LC Recovery Domain. Critical habitat was designated in the WLC recovery domain for UWR spring-run Chinook salmon, LCR Chinook salmon, LCR steelhead, UWR steelhead, and CR chum salmon. In addition to the Willamette and Columbia River mainstems, important tributaries on the Oregon side of the WLC include Youngs Bay, Big Creek, Clatskanie River, and Scappoose River in the Oregon Coast sub-basin; Hood River in the Gorge; and the Sandy, Clackamas, Molalla, North and South Santiam, Calapooia, McKenzie, and Middle Fork Willamette rivers in the West Cascades sub-basin.

The Willamette River, once a highly braided river system, has been dramatically simplified through channelization, dredging, and other activities that have reduced rearing habitat by as much as 75%. In addition, the construction of 37 dams in the basin blocked access to more than 435 miles of stream and river spawning habitat. The dams alter the temperature regime of the Willamette River and its tributaries, affecting the timing and development of naturally-spawned eggs and fry. Agriculture, urbanization, and gravel mining on the valley floor logging in the Cascade and Coast Ranges contribute to increased erosion and sediment loads throughout the basin.

The mainstem Willamette River has been channelized and stripped of large wood. Development began to encroach on the riparian forest beginning in the 1870s (Sedell and Froggatt 1984). Gregory *et al.* (2002a) calculated that the total mainstem Willamette River channel area decreased from 41,000 to 23,000 acres between 1895 and 1995. They noted that the lower reach, from the mouth of the river to Newberg (RM 50), is confined within a basaltic trench, and that due to this geomorphic constraint, less channel area has been lost than in upstream areas. The middle reach from Newberg to Albany (RM 50 to 120) incurred losses of 12% primary channel area, 16% side channels, 33% alcoves, and 9% islands. Even greater changes occurred in the upper reach, from Albany to Eugene (RM 187). There, approximately 40% of both channel length and channel area were lost, along with 21% of the primary channel, 41% of side channels, 74% of alcoves, and 80% of island areas.

The banks of the Willamette River have more than 96 miles of revetments; approximately half were constructed by the U.S. Army Corps of Engineers. Generally, the revetments were placed in

the vicinity of roads or on the outside bank of river bends, so that while only 26% of the total length is revetted, 65% of the meander bends are revetted (Gregory *et al.* 2002b). The majority of dynamic sections have been armored, reducing adjustments in channel bed and sediment storage by the river, and thereby diminishing both the complexity and productivity of aquatic habitats (Gregory *et al.* 2002b).

Riparian forests have diminished considerably in the lower reaches of the Willamette River (Gregory *et al.* 2002c). Sedell and Frogatt (1984) noted that agriculture and cutting of streamside trees were major agents of change for riparian vegetation, along with snagging of large wood in the channel. The reduced shoreline, fewer and smaller snags, and reduced riparian forest comprise large functional losses to the river, reducing structural features, organic inputs from litter fall, entrained allochthonous materials, and flood flow filtering capacity. Extensive changes began before the major dams were built, with navigational and agricultural demands dominating the early use of the river. The once expansive forests of the Willamette River floodplain provided valuable nutrients and organic matter during flood pulses, food sources for macroinvertebrates, and slow-water refugia for fish during flood events. These forests also cooled river temperatures as the river flowed through its many channels.

Gregory *et al.* (2002c) described the changes in riparian vegetation in river reaches from the mouth to Newberg, from Newberg to Albany, and from Albany to Eugene. They noted that the riparian forests were formerly a mosaic of brush, marsh, and ash tree openings maintained by annual flood inundation. Below the City of Newberg, the most noticeable change was that conifers were almost eliminated. Above Newberg, the formerly hardwood-dominated riparian forests along with mixed forest made up less than half of the riparian vegetation by 1990, while agriculture dominated. This conversion represents a loss of recruitment potential for large wood, which functions as a component of channel complexity, much as the morphology of the streambed does, to reduce velocity and provide habitat for macroinvertebrates that support the prey base for Pacific salmon and steelhead. Declining extent and quality of riparian forests have also reduced rearing and refugia habitat provided by large wood, shading by riparian vegetation, which can cool water temperatures, and the availability of leaf litter and the macroinvertebrates that feed on it.

Hyporheic flow in the Willamette River has been examined through discharge measurements and was found to be significant in some areas, particularly those with gravel deposits (Fernald *et al.* 2001). The loss of channel complexity and meandering that fosters creations of gravel deposits decreases the potential for hyporheic flows, as does gravel mining. Hyporheic flow processes water and affects its quality on reemerging into the main channel, stabilizing variations in physical and chemical water characteristics. Hyporheic exchange was found to be significant in the National Water-Quality Assessment of the Willamette basin (Wentz *et al.* 1998). In the transient storage zone, hyporheic flow is important for ecological functions, some aspects of water quality (such as temperature and dissolved oxygen), and some benthic invertebrate life stages. Alcove habitat, limited by channelization, combines low hydraulic stress and high food availability with the potential for hyporheic flows across the steep hydraulic gradients in the gravel separating them from the main channel (Fernald *et al.* 2001).

On the mainstem of the Columbia River, hydropower projects, including the Federal Columbia River Hydropower System (FCRPS), have significantly degraded Pacific salmon and steelhead habitats (Bottom *et al.* 2005, Fresh *et al.* 2005, NMFS 2005, and NOAA Fisheries 2006). The series of dams and reservoirs that make up the FCRPS block an estimated 12 million cubic yards of debris and sediment that would otherwise naturally flow down the Columbia and replenish shorelines along the Washington and Oregon coasts.

Industrial harbor and port development are also significant influences on the lower Willamette and lower Columbia Rivers (Bottom *et al.* 2005, Fresh *et al.* 2005, NMFS 2005, and NOAA Fisheries 2006). Since 1878, 100 miles of the mainstem Columbia River, its estuary, and Oregon's Willamette River has been dredged as a navigation channel by the Army Corps of Engineers. Originally dredged to a 20 foot minimum depth, the Federal navigation channel of the lower Columbia River is now maintained at a depth of 43 feet and a width of 600 feet. The lower Columbia River supports five ports on the Washington State side: Kalama, Longview, Skamania County, Woodland, and Vancouver. In addition to loss of riparian habitat, and disruption of benthic habitat due to dredging, high levels of several sediment chemicals, such as arsenic and polycyclic aromatic hydrocarbons (PAHs), have been identified in lower Columbia River watersheds in the vicinity of the ports and associated industrial activities.

The most extensive urban development in the lower Columbia River sub-basin occurs in the Portland/Vancouver area. Outside of this major urban area, the majority of residences and businesses rely on septic systems. Common water quality issues with urban development and residential septic systems include higher water temperatures, lowered dissolved oxygen, increased fecal coliform bacteria, and increased chemicals associated with pesticides and urban runoff.

The Columbia River estuary has lost a significant amount of tidal marsh and tidal swamp habitat that are critical to juvenile Pacific salmon and steelhead, particularly small or ocean-type species (Bottom *et al.* 2005, Fresh *et al.* 2005, NMFS 2005, and NOAA Fisheries 2006). Edges of marsh areas provide sheltered habitats for juvenile Pacific salmon and steelhead where food, in the form of amphipods or other small invertebrates, which feed on marsh detritus, is plentiful, and larger predatory fish can be avoided. Historically, floodwaters of the Columbia River inundated the margins and floodplains along the estuary, allowing juvenile Pacific salmon and steelhead access to a wide expanse of low-velocity marshland and tidal channel habitats. In general, the riverbanks were gently sloping, with riparian and wetland vegetation at the higher elevations of the river floodplain becoming habitat for Pacific salmon and steelhead during flooding river discharges or flood tides. Sherwood *et al.* (1990) estimated that the Columbia River estuary lost 20,000 acres of tidal swamps, 10,000 acres of tidal marshes, and 3,000 acres of tidal flats between 1870 and 1970. This study further estimated an 80% reduction in emergent vegetation production and a 15% decline in benthic algal production.

Habitat and food-web changes within the estuary, and other factors affecting salmon population structure and life histories, have altered the estuary's capacity to support juvenile salmon (Bottom *et al.* 2005, Fresh *et al.* 2005, NMFS 2005, and NOAA Fisheries 2006). Diking and filling activities that decrease the tidal prism and eliminate emergent and forested wetlands and

floodplain habitats have likely reduced the estuary's salmon-rearing capacity. Moreover, water and sediment in the lower Columbia River and its tributaries have levels of toxic contaminants that are harmful to fish and wildlife (LCREP 2007). Contaminants of concern include dioxins and furans, heavy metals, polychlorinated biphenyls (PCBs) and organochlorine pesticides such as dichlorodiphenyltrichloroethane (DDT). Simplification of the population structure and life-history diversity of salmon possibly is yet another important factor affecting juvenile salmon viability. Restoration of estuarine habitats, particularly diked emergent and forested wetlands, reduction of avian predation by terns, and flow manipulations to restore historical flow patterns might significantly enhance the estuary's productive capacity for salmon, although historical changes in population structure and salmon life histories may prevent salmon from making full use of the productive capacity of estuarine habitats, even in their presently altered state.

The NMFS recently designated critical habitat for southern green sturgeon, including coastal U.S. marine waters within 110 m depth from Monterey Bay, California, including Monterey Bay, north to Cape Flattery, Washington, including the Straits of Juan de Fuca, Washington, to its U.S. boundary; the Sacramento River, lower Feather river, and lower Yuba River in California; the Sacramento-San Joaquin Delta and Suisun, San Pablo, and San Francisco bays in California; the lower Columbia River estuary up to RM 46; and certain coastal bays and estuaries in California (Humboldt Bay), Oregon (Coos Bay, Winchester Bay, and Yaquina Bay), and Washington (Willapa Bay and Grays Harbor). In addition to the general exclusions listed above, the CHART determined that the following areas within the SONCC Domain will be excluded from critical habitat designations: Elkhorn Slough, Tomales Bay, Noyo Harbor, Eel River estuary, Klamath/Trinity River estuary, and the Rogue River estuary. Excluded estuary areas extend to the head of tide. The CHART based their determination on these areas having a low or ultra-low conservation value and a lack of documentation that southern green sturgeon use these areas extensively.

IC Recovery Domain. Critical habitat has been designated in the IC recovery domain, which includes the Snake River basin, for SR spring/summer run Chinook salmon, SR fall-run Chinook salmon, UCR spring-run Chinook salmon, SR sockeye salmon, MCR steelhead, UCR steelhead, and SRB steelhead. Major tributaries in the Oregon portion of the IC recovery domain include the Deschutes, John Day, Umatilla, Walla Walla, Grande Ronde, and Imnaha rivers.

Habitat quality in tributary streams in the IC recovery domain varies from excellent in wilderness and roadless areas to poor in areas subject to heavy agricultural and urban development (Wissmar *et al.* 1994, NMFS 2009b). Critical habitat throughout the IC recovery domain has been degraded by intense agriculture, alteration of stream morphology (*i.e.*, channel modifications and diking), riparian vegetation disturbance, wetland draining and conversion, livestock grazing, dredging, road construction and maintenance, logging, mining, and urbanization. Reduced summer stream flows, impaired water quality, and reduction of habitat complexity are common problems for critical habitat in developed areas.

Migratory habitat quality in this area has been severely affected by the development and operation of the FCRPS dams and reservoirs in the mainstem Columbia River, Bureau of Reclamation tributary projects, and privately owned dams in the Snake and Upper Columbia

river basins. For example, construction of Hells Canyon Dam eliminated access to several likely production areas in Oregon and Idaho, including the Burnt, Powder, Weiser, Payette, Malheur, Owyhee, and Boise river basins (Good *et al.* 2005), and Grande Coulee and Chief Joseph dams completely block anadromous fish passage on the upper mainstem Columbia River. Hydroelectric development modified natural flow regimes, resulting in higher water temperatures, changes in fish community structure leading to increased rates of piscivorous and avian predation on juvenile Pacific salmon and steelhead, and delayed migration for both adult and juveniles. Physical features of dams such as turbines also kill migrating fish. In-river survival is inversely related to the number of hydropower projects encountered by emigrating juveniles.

Similarly, development and operation of extensive irrigation systems and dams for water withdrawal and storage in tributaries have drastically altered hydrological cycles. A series of large regulating dams on the middle and upper Deschutes River affect flow and block access to upstream habitat, and have extirpated one or more populations from the Cascades Eastern Slope major population (IC-TRT 2003). Similarly, operation and maintenance of large water reclamation systems such as the Umatilla Basin and Yakima Projects have significantly reduced flows and degraded water quality and physical habitat in this domain.

Many stream reaches designated as critical habitat in the IC recovery domain are over-allocated under state water law, with more allocated water rights than existing streamflow conditions can support. Irrigated agriculture is common throughout this region and withdrawal of water increases summer stream temperatures, blocks fish migration, strands fish, and alters sediment transport (Spence *et al.* 1996). Reduced tributary stream flow has been identified as a major limiting factor for all listed Pacific salmon and steelhead species in this area except SR fall-run Chinook salmon.

Many stream reaches designated as critical habitat are listed on the state of Oregon's Clean Water Act section 303(d) list for water temperature. Many areas that were historically suitable rearing and spawning habitat are now unsuitable due to high summer stream temperatures. Removal of riparian vegetation, alteration of natural stream morphology, and withdrawal of water for agricultural or municipal use all contribute to elevated stream temperatures. Contaminants such as insecticides and herbicides from agricultural runoff and heavy metals from mine waste are common in some areas of critical habitat.

Environmental Baseline

This section describes the effects of past and ongoing human and natural factors within the action area, on the current status of the species, their habitats and ecosystems. The environmental baseline includes, "the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process (50 CFR 402.02).

The action area exists in the lower Columbia River basin, that portion of the mainstem Columbia River and its tributaries downstream of Bonneville Dam to its Pacific Ocean terminus. The baseline includes the existing Columbia River I-5 crossing (circa 1917 and 1958) and its connected stormwater infrastructure, thereby creating a transect in which all ESA-listed Columbia basin salmon, steelhead, sturgeon, and eulachon must intersect to fulfill their life histories. Though the Willamette River is downstream of the crossing, NMFS includes UWR fish albeit a lesser degree than other Columbia River basin species due to assumed natural straying. This point and the project's action area serve primarily as a migratory corridor for these species and to a lesser extent rearing. The action and all of its elements will occur in the lower Columbia River.

The current state of the lower Columbia River and the action area baseline originates from hydro effects (Federal Columbia River Power System), tributary habitat effects, estuary and plume habitat effects, predation and disease effects, hatchery effects, harvest effects, and large-scale environmental factors. In general, Columbia River salmon have been adversely affected by a broad number of human activities including habitat losses from all causes (population growth, urbanization, roads, diking, etc.), fishing pressure, flood control, irrigation dams, pollution, municipal and industrial water use, introduced species, and hatchery production (NRC 1996). In addition, salmon populations have been strongly affected by ocean and climate conditions.

The quality and quantity of habitat in many Columbia River basin watersheds have declined dramatically in the last 150 years. Forestry, farming, grazing, road construction, hydrosystem development, mining, and urbanization have changed the historical habitat conditions. Water diversions in Oregon have significantly depleted tributaries flows (NPPC 1992). Depleted tributary streamflows have been identified a major limiting factors for most species in the Interior Columbia basin (PCSRF 2007). Effects in the tributaries extend down into the mainstem Columbia as described in the following section Mainstem Effects.

Historically, the lower Columbia River sub-basin had an active connection between the channel and its floodplain, forming habitat diversity via flow and formation of side channels and deposition of woody debris. The Columbia River estuary is estimated to have once had 75% more tidal swamps. These areas provided feeding and resting habitat for juvenile salmonids in the form of low-velocity marshland and tidal channel habitats (Bottom *et al.* 2005).
The construction of dams, levees, dikes, and shipping channels through dredging between the 1930s and 1970s significantly altered the timing and magnitude of hydrologic events, and significantly reduced connection between the river and its floodplain. The Columbia River estuary historically received annual spring freshet flows that averaged 75–100% higher than current freshet flows. In addition, historical winter flows (October through March) were approximately 35–50% lower than current flows. The greater historical peak and variable flows encouraged greater sediment transport and more flooding wetlands, contributing to a more complex ecosystem than exists today (ISAB 2000). Reduced flow poses particularly high risks for juvenile anadromous fish. Dramatic reductions in flow compared to the historical spring freshet have increased the travel time of juvenile outmigrants. This increases potential exposure to predation, elevated temperatures, disease, and other environmental stressors (NMFS 2008d, Bottom *et al.* 2005).

Land-use practices and the development of multiple reservoir complexes in the Columbia's sub-basins significantly reduced the delivery of large wood and sediment. Availability of aquatic habitat for native fish, particularly those that rely heavily on low-velocity side channel habitat for holding, feeding, and rearing, has declined because of these changes to habitat-forming processes. Active navigation channel management by the Corps of Engineers through dredging has resulted in the filling of shallow-off channel habitats and expanded/created main-stem islands.

Water quality throughout the action area is degraded. Urban, industrial, and agriculture practices across the basin contribute multiple pollutants at levels harmful to aquatic life. The following exhibits the current conditions of pollutant loads within the lower Columbia River. The River and North Portland Harbor are on the DEQ 303(d) list for the following parameters: temperature, PCBs, PAHs, DDT metabolites such as dichlorodiphenyldichloroethylene (DDE), and arsenic (DEQ 2007a). The lower Columbia River is on the Washington State 303(d) list for temperature, PCBs, and dissolved oxygen (WDOE 2009b). The U.S. Environmental Protection Agency (EPA) has approved total maximum daily loads (TMDLs) for dioxin and total dissolved gas in the lower Columbia River (DEQ 1991, 2002).

In addition to the contaminants listed above, dissolved copper, a neurotoxin that damages the olfactory abilities of fish, is known to be present above naturally occurring levels in the lower Columbia River. Studies indicate that dissolved copper in the action area may occur at levels known to injure salmonids (WDOT 2005; WDOE 2006; DEQ 2009). In addition, fertilizers, pesticides and heavy metal contaminants are present in lower Columbia River sediments (DEQ 2007b, as cited in NMFS 2008c). Potentially, resulting in immunosuppression, and reduced growth rates in juvenile fish during their residence in the estuary (Arkoosh *et al.* 1991, 1994, 1998; Varanasi *et al.* 1993; Casillas *et al.* 1995a, 1995b, and 1998a, all cited in NMFS 2008c). It is recognized that roadways contribute pollutants such as copper, zinc, and PAHs into waterways through direct inputs via vehicular wear and by transporting anthropogenic atmospheric sources as well. The network of roadways within the lower Columbia River basin funded, built and maintained by the FHWA and its state DOT and local partners is vast, affecting the hydrology and water quality of the entire basin.

Species within the Action Area

All populations spawning within the Columbia River basin use the Columbia River mainstem and estuary to complete part of their life history, including migration, rearing and smoltification. With few exceptions for populations that spawn below RM 106, every individual from each of those populations must pass through the action area at least twice, during downstream migration as a juvenile and upstream migration as an adult.

The Columbia River and estuary serve three primary roles for outmigrating juveniles as they transition from shallow, freshwater environments to the ocean: (1) A place where juvenile fish can gradually acclimate to salt water; (2) a feeding area (main, and tidal channel, unvegetated shoals, emergent and forested wetlands, and mudflats) capable of sustaining increased growth rates; and (3) a refuge from predators while fish acclimate to salt water. Thus, though the

Columbia River and estuary is important to the survival and recovery of all ESA-listed salmonids, it is particularly important to ocean-type salmon. These stocks may be particularly sensitive to ecosystem changes because of their longer residence times and dependence on this portion of the river for growth and survival. In this consultation, NMFS focused on ocean-type salmon as an indicator of the importance of the lower Columbia River and estuary to all ESA-listed salmonids. NMFS focused on ocean-type salmon because they are an indicator of the most sensitive salmonid response to changes in estuary and river habitats. Neither critical habitat, nor take prohibitions exist for eulachon. For the purposes of this Opinion, the Lower River designates the freshwater fluvial portion of the river from Bonneville Dam downstream to a point above marine and fresh-water mixing or dominance. The Columbia River estuary extends from RM 47 to the Pacific Ocean and includes the zone where marine and freshwater mix.

Ocean-type salmon species in the Columbia River include Chinook species (LCR, SR fall-run, and UWR) and CR chum salmon. These species are the most likely to be affected by potential impacts of the Project, and thus are discussed in detail below. Ocean-type salmon migrate downstream to and through the estuary as subyearlings, generally leaving the spawning area where they hatched within days to months following their emergence from the gravel. Consequently, subyearlings commonly spend weeks to months rearing within the lower portion of the action area before reaching the size at which they migrate to the ocean.

The first outbound migrants of the Columbia River fall Chinook and chum may arrive in the action area as early as late February (Herrmann 1970; Craddock *et al.* 1976; Healey 1980; Congleton *et al.* 1981; Healey 1982; Dawley *et al.* 1986; Levings *et al.*1986). The majority of these fish are present from March through June. Outbound Snake River fall Chinook begin their migration much farther upstream and arrive in the Columbia River approximately a month later.

Ocean-type subyearlings arrive in the lower river and estuarine portion of the action area at a small size. The earliest migrants can be as small as 30 to 40 mm fork length when they arrive because some of these fish hatch only a short distance upstream from the action area. Later spring migrants are generally larger, ranging up to 50 to 80 mm. Subyearlings from the mid-Columbia and Snake Rivers tend to be substantially larger (70 to 100 mm) by the time they reach the lower Columbia River. The larger size of the lower Snake River fall Chinook, compared with the lower Columbia River Chinook and chum, likely indicates some differences in suitable habitat. The larger subyearlings from the Snake River can likely use a greater range of depth and current conditions than the subyearlings of the Columbia River species can.

Once ocean-type subyearlings arrive in the lower Columbia River, they may remain for weeks to months. Because these fish arrive small in size, they undergo extended lower river and estuary rearing before they reach the transitional size necessary to migrate into the ocean (70 to 100 mm). This larger size is necessary to deal with the physical conditions and predators they face in the ocean environment, as well as to be successful in obtaining prey in that environment. At growth rates of about 0.3 to 1 mm per day (Levy *et al.* 1979; Argue *et al.* 1985; Fisher and Pearcy 1990), the subyearlings require weeks to months to reach this larger size. During this time, young Chinook increase by about 5 to 8 grams per day or approximately 6% of their body weight (Herrmann 1970; Healey 1980).

Ocean-type subyearlings migrate through the riverine reach of the action area of the Project during their downstream migration (about 93 miles). Because of this, many spend some time rearing within the riverine reach; however, there is considerable variability in the freshwater rearing period of subyearling populations. Some subyearlings spawned in the lower reaches of coastal tributaries migrate almost immediately to marine areas following emergence from the gravel. Other subyearlings rear in freshwater for weeks to months, particularly those spawned well upstream in larger river systems such as the Columbia. The migration rate for subyearlings undergoing the rearing migration through the riverine reach is likely to be a few to ten km per day. Subyearlings migrating directly to the estuary migrate at rates of 15 to 30 km per day (MacDonald 1960; Simenstad *et al.* 1982; MacDonald *et al.* 1987; Murphy *et al.* 1989; Fisher and Pearcy 1990). Adult salmon returning to the Columbia River migrate through the river mouth throughout the year. The majority move through this area from early spring through autumn.

A number of physical characteristics in the riverine reach affect the quality and quantity of habitat available for salmonids. These include the availability of prey, temperature, turbidity, and suspended solids. Subyearlings are commonly found within a 10 feet of the shoreline at water depths of less than 3 feet. Although they migrate between areas over deeper water, they generally remain close to the water surface and near the shoreline during rearing, favoring water no more than 2 meters deep and areas where currents do not exceed 1 foot per second. They seek lower energy areas where waves and currents do not require them to expend considerable energy to remain in position while they consume invertebrates that live on or near the substrate. These areas are characterized by relatively fine grain substrates. However, it is not uncommon to find young salmonids in areas with steeper and harder substrates, such as sand and gravel.

Young Chinook in the lower Columbia River action area consume a variety of prey, primarily insects in the spring and fall and *Daphnia* from July to October (Craddock *et al.* 1976). *Daphnia* are the major prey during the summer and fall months, selected more than other planktonic organisms. Young salmonids consume diptera, hymenoptera, coleoptera, tricoptera, and ephemeroptera in the area just upstream from the estuary (Dawley *et al.* 1986). Bottom and Jones (1990) recently reported that young Chinook ate primarily *Corophium*, *Daphnia*, and insects, with *Corophium* being the dominant prey species in winter and spring and *Daphnia* the dominant prey species in summer. Salmonids commonly feed on *Corophium* males, which apparently are more readily available than the larger females.

Corophium is commonly discussed as a primary prey item of juvenile salmonids in the Columbia River. *Corophium salmonis* is a euryhaline species tolerating salinities in the range of zero to 20 ppt (Holton and Higley 1984). As shown by the above investigations, it is one of several major prey species consumed by juvenile Chinook under existing conditions. No data are available that indicate its historical role in the diet of Columbia River salmon before substantial modification of the river system. Nutritionally, *Corophium* may not be as desirable as other food sources for young salmon. According to Higgs *et al.* (1995), gammarid amphipods such as *Corophium* are high in chitin and ash and low in available protein and energy relative to daphnids and chironomid larvae.

Subyearling Chinook and chum first enter the estuary at about the same time that they enter the riverine potion of the lower Columbia River because some of the fry move rapidly to the estuary by mid-March rather than rearing in the riverine areas (Craddock *et al.* 1976; Dawley *et al.* 1986; Levy and Northcote 1982; Healey 1982; Hayman *et al.* 1996). As Chinook fry migrate to the estuary, they may remain in the low salinity or even freshwater areas for some time until they have grown somewhat larger (more than 75 mm) (Kjelson 1982; Levings 1982; Levy and Northcote 1982; MacDonald *et al.* 1986; Shreffler *et al.* 1992; Hayman *et al.* 1996). However, some Chinook fry appear to move immediately to the outer edges and higher salinity portions of the estuary (Stober *et al.* 1971; Kask and Parker 1972; Healey 1980; Johnson *et al.* 1992; Beamer *et al.* 2000).

Ocean-type fish commonly have the capacity to adapt to highly saline waters shortly after emergence from the gravel. Tiffan *et al.* (2000) determined that, once active migrant fall Chinook passed McNary Dam 470 km upstream from the Columbia River's mouth, 90% of the subyearlings were able to survive challenge tests in 30 ppt seawater at 18.3^{o}C. Other investigators have found that very small Chinook fry are capable of adapting to estuarine salinities within a few days (Clark and Shelbourn 1985). Wagner *et al.* (1969) found that all fall Chinook alevins tested were able to tolerate 15 to 20 ppt salinity immediately after hatching.

In addition, young salmonids in the estuary continue to eat many of the same organisms as are consumed in the riverine reach of the lower Columbia River, but there are shifts in prey abundance. Young Chinook and chum at Miller Sands in the upper estuarine reach feed primarily on the pelagic prey *Daphnia longispina* and *Eurytemora hirundoides*, the benthic prey *Corophium salmonis*, and chironomid larvae and pupae (McConnell *et al.* 1978). Diet overlaps considerably among the different species. Many yearlings passing through the lower river were found to have empty or less than full stomachs (Dawley *et al.* 1986).

Adult salmon returning to the Columbia River migrate through the river mouth throughout the year although most move through this area from early spring through autumn (Appendix B).

Southern green sturgeon. The following information is summarized from NMFS 2009c and NMFS 2008x. The Columbia River estuary is the center of the largest observed aggregation of North American green sturgeon. Southern green sturgeon mix with non-ESA designated northern fish in large aggregations in marine waters of the lower Columbia River estuary. Patterns of telemetry data suggest that southern fish use the Columbia as summering grounds and overwinter in coastal waters off central California and between Vancouver Island, BC, and southeast Alaska. The upriver extent of marine waters in the Columbia is approximately RM 46, coinciding with the extent of designated critical habitat. However, green sturgeon are assumed to travel to Bonneville Dam (RM 146), though in significantly lower numbers, based on lack of barriers and harvest studies. Tagging studies have only sampled individuals to RM 46, while commercial data suggests some movement to Bonneville Dam based on commercial zone harvest reports. Data from 1981–2004 shows a combined catch of 290 southern and northern fish above RM 52, and approximately 37,000 caught below, primarily below RM 20. The CRC footprint is at RM 106.

After leaving their natal grounds in the Sacramento River at around the age of three years and traveling as sub-adults in marine waters they distribute themselves along the West Coast and estuarine waters. Those adult and subadult green sturgeon that spend transient time in the Columbia River estuary feed on crangonid shrimp, burrowing thalassinidean shrimp (primarily the burrowing ghost shrimp (*Neotrypaea californiensis*), but possibly other related species), amphipods, clams, juvenile Dungeness crab (*Cancer magister*), anchovies, sand lances (*Ammodytes hexapterus*), lingcod (*Ophiodon elongatus*), and other unidentified fishes. Burrowing ghost shrimp made up about 50% of the stomach contents of green sturgeon sampled in 2003. Subadults and adults feeding in bays and estuaries may be exposed to contaminants that may affect their growth and reproduction. Studies on white sturgeon in estuaries indicate that the bioaccumulation of pesticides and other contaminants adversely affects growth and reproductive development and may result in decreased reproductive success. Green sturgeon are believed to experience similar risks from contaminants.

Eulachon. The Columbia River and its tributaries support the largest eulachon run in the world (Hay *et al.* 2002). Eulachon use the mainstem Columbia River portion of action area primarily to migrate to spawning grounds as adults, and as larvae to emigrate out of freshwater into marine waters soon after emergence. Large spawning runs of eulachon occur in the mainstem lower Columbia River and the tributary Cowlitz, Lewis, Sandy (Craig and Hacker 1940), Grays (Smith and Saalfeld 1955), Kalama (DeLacy and Batts 1963), and Elochoman rivers and Skamokawa Creek (WDFW and ODFW 2001). Smith and Saalfeld (1955) stated that eulachon were occasionally reported to spawn up to the Hood River on the Oregon side of the Columbia River prior to the construction of Bonneville Dam in the 1930s. In times of great abundance (*e.g.*, 1945, 1953) eulachon have been known to migrate as far upstream as Bonneville Dam (Smith and Saalfeld 1955, WDFW and ODFW 2008) and may extend above Bonneville Dam by passing through the ship locks (Smith and Saalfeld 1955). The Status Review Update for Eulachon in Washington, Oregon, and California (EBRT 2010) reports that evidence of mainstem exists as well, but notes that additional sampling is needed to determine the extent and amount.

The majority of reproduction occurs in those tributaries downstream of the CRC, with reproduction unpredictable upstream of the CRC. Annual catch records show eulachon to be absent from the Sandy River in 12 one or more consecutive years (JCRMS 2006). Eulachon runs have been recorded 31 of 81 years (1929–2009), with sustained absences in 1958–1970 and 1989–2000. Return run timing of eulachon is varied, the majority of adults entering the Columbia River from the middle of February. Using the Lewis and Sandy Rivers as a proxy to the CRC, the nearest downstream and upstream spawning areas, the majority of the adults should pass through the CRC project area in April and May. Impact driving of pile would occur up to April 15 each year.

Habitat preferences of eulachon within the Columbia River are not well understood. With the exception of preferred spawning habitat (which is typically coarse sand or pea-sized gravel substrate), observational data suggest that migrating eulachon exhibit little preference for habitat type, and may use deep, shallow, brightly lit, and/or shaded portions of the river. Outmigrants may occur anywhere along the river's transect, and at all depths (Langness 2009 personal communication). Larval eulachon have been found in some studies at greater densities at the bottom of the water column, compared to mid-level or near the surface, and may occur in greater densities outside the navigation channel than within the channel (Howell *et al.* 2001). However, because they are relatively weak swimmers, larval eulachon distribution and use of the water column is thought to be determined by local hydraulic conditions rather than by depth at a particular site (Langness 2009 personal communication; Howell *et al.* 2001). Typical or optimal water velocities for eulachon migration or spawning are not known (Langness 2009 personal communication).

The eulachon have declined to what appear to be nearly historically low levels in the Columbia River. The Eulachon Biological Review Team (EBRT 2010) ranked climate change and its impacts to ocean conditions as the most serious threat to eulachon. As well, climate change impacts on freshwater habitat and eulachon bycatch were scored as moderate to high risk, and dams and water diversions in the Columbia River. Variable year-class strength in marine fishes with pelagic larvae is dependent on survival of larvae prior to recruitment and is driven by match-mismatch of larvae and their planktonic food supply (Lasker 1975, Sinclair and Tremblay 1984), oceanographic transport mechanisms (Parrish *et al.* 1981), variable environmental ocean conditions (Shepherd *et al.* 1984, McFarlane *et al.* 2000), and predation (Bailey and Houde 1989). The operation of these dynamic ocean conditions and their impacts on eulachon recruitment were amply illustrated in the Columbia River population where high larval densities were observed in 2000–2003, followed by lower than average adult returns in 2004, 2005, and 2006 (JCRMS 2007). However, the ability of the Columbia River eulachon stock to respond rapidly to the good ocean conditions of the late 1999-early 2002 period illustrates the species' resiliency and the BRT viewed this resiliency as providing the species with a buffer against future environmental perturbations. Recent invasions of Asian copepods into the Columbia River estuary (Cordell *et al.* 2008) may have a negative influence on the Columbia River population as well.

Eulachon, like Pacific salmon and steelhead, must pass through the lower Columbia River, estuary and river mouth twice: Once as juveniles en route to the Pacific Ocean and again as adults when they return to spawn. Moreover, eulchon that spawn in the Sandy River pass through the part of the action area where underwater noise is expected to reach injurious levels. Like other individuals in this species, those fish are likely to be in a stressed condition due to increased water temperatures, insufficient streamflow, altered sediment balances, water pollution, over-harvest, predation, and other adverse habitat conditions in the lower Columbia River.

Eastern Steller Sea Lion. Eastern Steller sea lions occur in Oregon waters throughout the year, and use breeding rookeries at Rogue Reef and Orford Reef and haulout locations along the Oregon coast. There are four haulout sites used by Steller sea lions in the lower Columbia

River and these include the tip of the South Jetty, where greater than 500 Steller sea lions commonly occur, and three locations proximate to and at the Bonneville Dam tailrace area where Steller sea lions occasionally occur.

Over the last nine years, the number of eastern Steller sea lions seasonally present at the Bonneville dam has increased from zero individuals in 2002 to a minimum estimate of 75 subadult and adult male Steller sea lions in 2010, which although an increase is still a relatively small number of individuals (Stansell *et al.* 2008, 2009, Stansell and Gibbons 2010, Stansell *et al.* 2010).

The few eastern Steller sea lions that travel up the lower Columbia River to the tailrace area of Bonneville Dam travel there to forage on anadromous fishes. Some individual Steller sea lions occur at the tailrace area as early as fall; their numbers peak in winter to early spring and they depart by late spring (Stansell *et al.* 2008, 2009, Stansell and Gibbons 2010). Individuals are likely to transit through the river up to the tailrace area within 1-2 days with transit speeds of 4.6 km/hr in the upstream direction and 8.8 km/hr in the downstream direction (based on the transit times of California sea lions, Brown *et al.* 2010). Therefore, individuals likely spend little time in any one location prior to their arrival in the tailrace area.

In-season return trips between the river mouth and the tailrace area may occur, but limited data suggest that eastern Steller sea lions make few if any return trips until their departure from the tailrace area by late spring. Only one of less than 10 individual eastern Steller sea lions tagged with acoustic/satellite-tags was observed to make an in-season return trip; all others made a single trip, departing by late spring (data collected in 2010, B. Wright unpublished data). However, tags were deployed in the middle of the season, and therefore, return trips could occur more commonly or regularly in the early part of the season.

Eastern Steller sea lions that would transit through the action area were affected by an upriver deterrence program from 2008 to 2010 to reduce pinniped impacts on ESA-listed Pacific salmon and steelhead below Bonneville Dam on the lower Columbia River. NMFS previously consulted on the effects of this program, and concluded that the non-lethal deterrence activities that target Steller sea lions are likely to adversely affect, but not likely to jeopardize Steller sea lions (NMFS 2008e).

Eastern Steller sea lions that are likely to be affected by this proposed action have shown increasing habituation in recent years to the various hazing techniques used to deter the animals from foraging on sturgeon and salmon in the Bonneville tailrace area, including acoustic deterrent devices, boat chasing, and above-water pyrotechnics (Stansell *et al.* 2010, Brown *et al.* 2010). Additionally, many of the individuals that travel to the tailrace area return in subsequent years (NMFS 2008e).

Critical Habitat within the Action Area

Critical habitat units are described by their PCEs. PCEs are the physical and biological features of critical habitat essential to the conservation of listed species, including, but not limited to:

(1) Space for individual and population growth and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and (5) habitats that are protected from disturbance or are representative of the historic geographic and ecological distributions of a species (USFWS and NMFS 1998).

Pacific salmon and steelhead. Four of the six PCEs used to describe Pacific salmon and steelhead critical habitats occur within the action area: freshwater spawning sites, freshwater rearing sites, and freshwater migration corridors. PCEs related to nearshore and marine areas are important elsewhere but do not occur within the action area.

Freshwater spawning sites. Spawning habitat is extremely limited in the action area, and is present for only three species. CR chum spawn in shallow habitat on the north shore of the lower Columbia River, near Government Island at approximately RM 115, where water quantity and quality conditions and substrate do not fully support spawning, incubation, and larval development. The rest of the action area appears to lack suitable spawning habitat, such as gravel substrate influenced by groundwater seeps, or else is at risk when river management lowers water levels and expose the eggs to the atmosphere. Economic development in some upland areas adjacent to spawning sites threatens to reduce groundwater seeps that support good spawning conditions. This PCE has marginal conservation in the action area.

Freshwater rearing sites. Freshwater rearing occurs throughout the action area although it lacks water quantity and floodplain connectivity necessary to form and maintain physical habitat conditions that fully support juvenile growth and mobility; water quality and forage necessary to fully supporting juvenile development; and has extremely limited natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks. Without these features, juvenile Pacific salmon and steelhead cannot access and use areas as necessary for them forage, grow, and develop behaviors (*e.g.*, predator avoidance, competition) that help ensure their survival. Floodplain connectivity with associated off-channel refugia is limited or absent in the action area. Dikes, levees, and bank armoring are common and urban development extends up to river's edge in many locations. Natural cover is reduced or absent due to the highly altered and managed nature of the river channel. Flow control at Bonneville Dam leads to rapid changes in water levels and sometimes strand or entrap juveniles when water levels drop. The absence of productive riparian vegetation and complex shallow water habitat severely reduce the abundance and diversity of forage available for juvenile salmonids.

Freshwater migration corridors. The entire action area is a migration corridor for juveniles and adults. Although the action area is relatively free of obstruction, it has high levels of predation, poor water quantity and quality conditions, and lacks well-developed natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks that support juvenile and adult mobility and survival. The deficiency of those features reduces access within the action area to the variety of habitats necessary for juveniles to avoid high flows, avoid predators, successfully compete, begin the behavioral and physiological changes needed for life in the ocean, and reach the ocean in a

timely manner. Similarly, lack of these features reduce the ability of adults in a non-feeding condition to successfully swim upstream, avoid predators, and reach spawning areas on limited energy stores. Although no physical barrier completely blocks fish passage through the action area, habitat and food web degradation increase the difficulty of migration and decrease the conservation value of this PCE.

Estuarine areas. The action area includes most of the Columbia River estuary and, although it is relatively free of physical obstructions, water quality, water quantity, and salinity conditions there do not fully support juvenile and adult physiological transitions between fresh- and saltwater. Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels are poor. Juvenile and adult forage is also poor, including lack of aquatic invertebrates and fishes that provide the energy to support growth and maturation. Without better access to those resources in the action area, juveniles are less likely to reach the ocean in a timely manner and use the variety of habitats that allow them to avoid predators, compete successfully, and complete the behavioral and physiological changes needed for life in the ocean. Similarly, lack of those features do not fully support adults because they provide less abundant forage as necessary to provide the energy stores needed to make the physiological transition to fresh water, migrate upstream, avoid predators, and develop to maturity upon reaching spawning areas. As noted in the Status of Critical Habitat section, above, development of hydropower, industrial harbors and ports, and urban areas have contributed to extensive losses of tidal marshes and swamps in the estuary, and other changes in aquatic habitats and food webs that reduce the conservation value of this important PCE.

Southern green sturgeon. PCEs used to describe critical habitat for southern green sturgeon are less differentiated than PCEs for Pacific salmon and steelhead, but two of the three are present within the action area from the mouth of the Columbia River up to RM 46, including freshwater riverine systems and estuarine areas. PCEs related to coastal marine areas do not occur within the action area.

Freshwater riverine systems. The action area includes poor forage for subadult and adult sturgeon likely to occur there, although substrates for spawning are unnecessary as this population spawns exclusively in the Sacramento River. Management of the lower Columbia River flow regime is likely to have altered the magnitude, frequency, duration, seasonality, and rate-of-change of fresh water discharge over time that is less than optimal for the normal behavior, growth, and survival of southern green sturgeon. Water quality impairments, including temperature, salinity, oxygen content, and other chemical characteristics, are also likely to limit normal behavior, growth, and viability. Conditions for the safe and timely passage of southern green sturgeon within the river, and between the river and the estuary, are present, with many pools greater than 15 feet deep for upstream and downstream holding of adult or subadult fish.

Estuarine habitats. As noted in the Status of Critical Habitat section above, development of hydropower, industrial harbors and ports, and urban areas have contributed to extensive losses of tidal marshes and swamps in the estuary, and other changes in aquatic habitats and food webs that reduce the conservation value of this important PCE. The action area includes poor forage for subadult and adult sturgeon, although it is likely that flows within the estuary are adequate to

subadults and adults to successfully orient to the incoming flow and migrate upstream. The water quality impairments that affect the freshwater riverine PCE Water quality also impair the Columbia River estuary. Conditions for the safe and timely passage of southern green sturgeon within the river, and between the river and the estuary, are present, with many pools greater than 15 foot deep for upstream and downstream holding of adult or subadult fish.

Effects of the Action

Effects of the action refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). Indirect effects are those caused by the proposed action and are later in time, but still are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those lacking independent utility apart from the action under consideration.

The primary effects of CRC will include elevated levels of underwater noise, reduced water quality, and physical habitat alteration associated with the structural footprint of the CRC bridges. For reasons explained below, the underwater noise will occur as short-term pulses (*i.e.,* minutes to hours), separated by virtually instantaneous and complete recovery periods. These disturbances are likely to occur several times a day for up to a week, two to 14 weeks per year, for six years (Table 4). Water quality impairment will also occur as short-term pulses (*i.e.,* minutes to hours) during construction, most likely due to erosion during precipitation events, and will continue due to stormwater runoff for the design life of CRC. Physical habitat alteration due to modification and replacement of existing in-water and over-water structure also occur intermittently during construction, and will remain as the final, as-built project footprint for the design life of CRC.

Impact pile driving will produce a variety of underwater noise levels within radii here referred to collectively as the impact zone (Table 24). In the absence of site-specific data, these radii were calculated using the Practical Spreading Loss model for determining the extent of sound from a source (Thomsen *et al.* 2006, Stadler 2010). The contractor will use a bubble curtain and similar devices to provide sound attenuation during impact pile driving. Underwater noise caused by vibratory installation will be less than impact driving (CALTRANS 2009, WDOT 2010b). Moreover, oscillating and rotating steel casements for drilled shafts are not likely to elevate underwater sound to a level that is likely to cause injury or noise that would cause adverse changes to fish behavior.

Table 24. Maximum predicted effects of impact pile driving for the Columbia River Crossing. FHWA and FTA assume that attenuation such as bubble curtains and dewatered cofferdams will achieve a 10 dB noise reduction.

Effect Characteristics ("impact zone")	24-inch Pile		48-inch Pile	
	Without Attenuation	With Attenuation	Without Attenuation	With Attenuation
Root mean square sound pressure level radius exceeds 150 dB re: 1 μPa (distance in feet)	13,058	2814	66,144[1]	17,751
Cumulative sound exposure level radius that exceeds 183 dB re: 1 μPa^2•sec (distance in feet)	1466	177	3250	774
Cumulative sound exposure level radius that exceeds 187 dB re: 1 μPa^2•sec (distance in feet)	823	164	1771	449
Peak sound pressure level that exceeds 206 dB re: 1 μPa (distance in feet)	23	16	112	82

[1] Upstream distance; downstream radius is 29,031 feet due to topographic interception.

Pile installation and removal, and installation and operation of the bubble curtain, will disturb the sediments in the action area and result in some re-suspension of coarse-grained material into the water column. Pile removal is likely to expose a greater amount of sediment due to adhesion of sediment to pile. However, because pile occupies a small area of primarily sandy substrates that are often rearranged by river currents, any increase in turbidity will be small.

Sediment and contaminants are likely to be released into the water by construction activities that are part of the proposed action, including geotechnical surveys, excavation, grading, filling, and in-water work area isolation that is necessary to rehabilitate or replace existing roads, culverts, and bridges, and to construct and maintain stormwater facilities. Soil disturbance will increase the rate at which wind and water erosion will carry sediment into the lower Columbia River. Contamination of sediment from the project area is probable from urban practices, industry and automobile releases. Additionally, the use of heavy construction equipment results in small, unpredictable releases of fuel, lubricant, and hydraulic fluids. The release of construction material, though minor is likely to occur as well (grinding slurry, concrete, and rubble). Grinding slurry will be released from the use of underwater wire-cable saws to dismantle the existing I-5 bridge piers. The traceable turbidity extent of slurry is not anticipated to exceed three-hundred feet.

Discharge of stormwater runoff from CIA associated with the proposed action will also contribute a variety of pollutants to the lower Columbia River that originate directly from automobiles and indirectly via aerial deposition from industrial and agricultural production. These pollutants will include, but are not limited to, nutrients, metals (arsenic, copper, chromium, lead, mercury, and nickel), PAHs, sediment, and pesticides (LCREP 2007; Buckler and Granato 1999, Colman *et al.* 2001, Kayhanian *et al.* 2003).

Pollutants like these travel long distances in rivers either in solution, adsorbed to suspended particles, or retained in sediments until mobilized, transported by future sediment moving flows (Anderson *et al.* 1996, Alpers *et al.* 2000a, 2000b). The toxicity of these pollutants varies other

water quality speciation and concentration. Regarding dissolved heavy metals, Santore *et al.* (2001) indicates that the presence of natural organic matter and changes in pH and hardness affect the potential for toxicity (increase and decrease). Additionally, organics such (living and dead) can adsorb and absorb other pollutants such as PAHs. The variables of organic decay further complicate the path and cycle of pollutants. The persistence and speciation of these pollutants cause effects and consequentially the action area to extend from the points of stormwater discharge to the downstream terminus of the Columbia River, approximately 106 RM.

Stormwater treatment proposed by the FHWA and FTA is based on a design storm (50% of the 2-year, 24 hour storm) that will generally result in more than 95% of the runoff from all impervious surfaces within the CRC area being infiltrated at or near the point at which rainfall occurs. The treatment will consist of infiltration practices such as bioretention, bioslopes, infiltration ponds, and porous pavement, supplemented with appropriate soil amendments as needed. [5] The stormwater literature identifies these practices as excellent treatments to reduce or eliminate contaminants from highway runoff (Barrett *et al.* 1995, CWP and MDE 2000, NCHRP 2006, WDOT 2006, Hirshman *et al.* 2008).

The FHWA and FTA propose to capture, manage, and treat all of the CIA for the CRC, but 6.8 acres of CIA are still unaccounted for in a stormwater management plan (Table 7). Moreover, the proposed treatment will not eliminate all stormwater pollutants. Thus, some adverse effects of stormwater runoff will exist for the design life of the CRC and, because little to no treatment currently exists for this portion of the I-5 corridor, the CRC will decrease in the level of stormwater pollutants currently discharged into the lower Columbia River.

Construction of the CRC bridges will temporarily displace 2.0 acres in-channel habitat for the isolation of in-water work areas, including temporary sheet piles, and permanently displace 0.17 acres of benthic habitat for bridge columns. CRC will also temporarily create 2.28 acres of new over-water structure due to barges, work platforms, and in-water work isolation areas, and 1.58 acres of permanent over-water structure, although the specific amount of habitat area displaced at any time will vary throughout the construction period.

The river-spanning portion of the CRC is approximately 28 acres, based on an assumed bridge width of 300 feet. Of the 28 acres, approximately 3 acres are shallow-water or nearshore habitat and most of that will occur in the river channel portion of the project footprint, where high water velocities and highly mobile sand substrates reduce habitat values. High quality off-channel habitat does not exist in the project footprint due to the effects of past diking, dredging, and bank hardening.

[5] See also Memos from Ronan Igloria, HDR (Henningson, Durham, and Richardson, Inc.), to Jennifer Sellers and William Fletcher, Oregon Department of Transportation, dated December 28, 2007 (Stormwater Treatment Strategy Development – Water Quality Design Storm Performance Standard), February 28, 2008 (Stormwater Treatment Strategy Development – Water Quantity Design Storm Performance Standard - Final), and April 15, 2008 (Stormwater Treatment Strategy Development – BMP Selection Tool).

Construction of the CRC will also cause the loss of approximately 10,000 square feet of riparian canopy, including 15 trees, in areas where riparian vegetation has a patchy distributed due to past development.

Conversely, construction of the CRC will remove all in-water components of the I-5 bridges that currently span the mainstem lower Columbia River. The North Portland Harbor bridges will be retained and widened. Because the replacement structures will occupy less in-channel area than the current ones, removal of their in-water components down to the riverbed will release approximately 3,000 square feet of overhead space for unencumbered ecological function.

Of these physical habitat effects, those associated with shade from the temporary work decks and barges area likely to be the most ecologically important because those temporary structures will be in contact or close proximity to the water's surface where, under well-lighted conditions, they can create a sharp contrast to the ambient light gradient (Table 25). Permanent CRC features, like bridge superstructures, will all be approximately 95 feet above the river surface and therefore less likely to affect local light levels.

Table 25. Summary of predicted shade due to over-water for the Columbia River Crossing.

Type of Structure	Columbia River	North Portland Harbor
	Area (acres)	Area (acres)
Temporary		
Work platforms for drilled shafts	3.40	0.69
Tower cranes	0.06	--
Oscillator support platforms	0	0.64
Construction barges	2.44	24.91
Demolition barges	0.10	--
Total acres	5.89	26.23
Permanent		
Shaft caps	1.54	--
New bridge spans	15.52	7.12-9.55
Existing bridge spans to be removed	- 6.52	--
Other overwater structure to be removed	- 0.29-0.81	--
Total acres	9.53-10.04	7.12-9.55

Species within the Action Area

All populations of Pacific salmon and steelhead and eulachon that spawn within the Columbia River basin use the Columbia River mainstem and estuary to complete part of their life history, including migration, rearing and smoltification. Except for populations that spawn below RM

106, every individual from each of those populations must pass through the action area at least twice, during downstream migration as a juvenile and upstream migration as an adult. Southern green sturgeon do not spawn in the Columbia River basin although large aggregations of subadults and adults occur in estuary and occasionally venture as far upstream and the CRC.

Work area isolation. If work area isolation is necessary for Piers 2 and 7, or any other part of the work site, any juvenile salmon or steelhead present in the work isolation area will be captured and released. It is unlikely that any adult salmon or steelhead, or any southern green sturgeon or eulachon will be affected by this procedure, however, because it will occur when adults are unlikely to be present and, if any are present, their size allows them to easily escape from the containment area. Capturing and handling fish causes them stress though they typically recover fairly rapidly from the process and therefore the overall effects of the procedure are generally short-lived (NMFS 2002). The primary contributing factors to stress and death from handling are differences in water temperature between the river where the fish are captured and wherever the fish are held, dissolved oxygen conditions, the amount of time that fish are held out of the water, and physical trauma. Stress on salmonids increases rapidly from handling if the water temperature exceeds 18°C (64°F) or dissolved oxygen is below saturation. Proposed design criteria regarding fish capture and release, use of pump screens during the de-watering phase, and fish passage around the isolation area will comply with NMFS guidance to reduce the adverse effects of these activities (NMFS 2000, 2008f).

Underwater noise. Underwater sound pressure waves can injure or kill fish (Reyff 2003, Abbott and Bing-Sawyer 2002, Caltrans 2001, Longmuir and Lively 2001, Stotz and Colby 2001). Fish with swim bladders, including Pacific salmon and steelhead and southern green sturgeon are particularly sensitive to underwater impulsive sounds with a sharp sound pressure peak occurring in a short interval of time (Caltrans 2001). As the pressure wave passes through a fish, the swim bladder is rapidly squeezed due to the high pressure, and then rapidly expanded as the under pressure component of the wave passes through the fish. The pneumatic pounding may rupture capillaries in the internal organs as indicated by observed blood in the abdominal cavity, and maceration of the kidney tissues (Caltrans 2001). Although eulachon lack a swim bladder, they are also susceptible to general pressure wave injuries including hemorrhage and rupture of internal organs, as described above, and damage to the auditory system. Direct take can cause instantaneous death, latent death within minutes after exposure, or can occur several days later. Indirect take can occur because of reduced fitness of fish making it susceptible to predation, disease, starvation, or ability to complete its life cycle.

A multi-agency work group consisting of key technical and policy staff, supported by national experts on sound propagation activities that affect fish and wildlife species of concern, determined that to protect listed species, , sound pressure waves should be within a single strike threshold of 206 dB re: 1 µPa, and for cumulative strikes sound pressure waves should be less than 187 dB re: 1 μPa^2•sec sound exposure level for fish that are larger than 2 grams and less than 183 dB re: 1 μPa^2•sec sound exposure level for fish that are smaller than 2 grams (FHWG 2008). Any salmon or steelhead that occurs within the radius where the root mean square sound pressure level will exceed 150 dB re: 1 μPa^2 may experience a temporary threshold shift in hearing due to a temporary fatiguing of the auditory system that can reduce the survival, growth,

and reproduction of the affected fish by increasing the risk of predation and reducing foraging or spawning success (Stadler and Woodbury 2009).

Thus, noise levels that are predicted to be produced by CRC (Table 24) are likely to injure or kill OC chum salmon embryos and alevins, and any juvenile salmon or steelhead weighing less than 2 grams, that occur within the radius where the noise produced by a strike pile strike will exceed 206 dB re: 1 µPa, or where the cumulative sound exposure level will exceed 183 dB re: 1 μPa^2•sec. Similarly, any juvenile salmon and steelhead that weigh more than 2 grams, and any adult salmon or steelhead, that occur within the radius where the noise produced by a pile strike will exceed 206 dB re: 1 µPa, or where the cumulative sound exposure level will exceed 183 dB re: 1 μPa^2•sec are likely to be injured or killed. Finally, any ESA-listed fish that occurs within the radius where the root mean square sound pressure level will exceed 150 dB re: 1 μPa^2 may experience an temporary threshold shift in hearing that will increase the risk that those individuals will be subject to predation and reduce their likelihood of foraging or spawning success.

Reduced water quality. The discharge of stormwater will expose adult and juvenile ESA-listed fish in the Columbia River from the points of discharge within the channel downstream to the mouth. Additionally, effects to LCR species will occur in Burnt Bridge Creek, and exposure of both LCR and UWR juveniles will occur in the Columbia Slough. The later is a terminal slough without adult habitat. Though treatment will occur, the ability to remove pollutants to a level without effect upon ESA-listed fish, or that does not synergistically combine with other sources is technologically limited and unfeasible. Exposure to these ubiquitous contaminants even in low concentrations is likely to affect the survival and productivity of salmonids-juveniles in particular (Loge *et al.* 2006, Hecht *et al.* 2007, Johnson *et al.* 2007, Sandahl *et al.* 2007, Spromberg and Meador 2006). Short-term exposure to contaminants such as pesticides and dissolved metals may disrupt olfactory function (Hecht 2007) and interfere with associated behaviors such as foraging, anti-predator responses, reproduction, imprinting (odor memories), and homing (the upstream migration to their natal stream). The toxicity of these pollutants varies other water quality speciation and concentration. Regarding dissolved heavy metals, Santore *et al.* (2001) indicates that the presence of natural organic matter and changes in pH and hardness affect the potential for toxicity (increase and decrease). Additionally, organics such (living and dead) can adsorb and absorb other pollutants such as PAH. The variables of organic decay further complicate the path and cycle of pollutants.

The release of contaminants is likely to occur. Wind and water erosion is likely to entrain and transport soil from disturbed areas contributing fine sediments that are likely to contain pollutants, and the use of the use of heavy equipment, including stationary equipment like generators and cranes, also creates a risk that accidental spills of fuel, lubricants, hydraulic fluid, coolants, and other contaminants may occur. Petroleum-based contaminants, such as fuel, oil, and some hydraulic fluids, contain PAHs, which are acutely toxic to salmonid fish and other aquatic organisms at high levels of exposure and cause sublethal adverse effects on aquatic organisms at lower concentrations (Heintz *et al.* 1999, 2000, Incardona *et al.* 2004, 2005, 2006).

However, due to the relatively small amount of time that any heavy equipment will be in the water and the use of proposed conservation measures, including site restoration after construction is complete, any increase in contaminants is likely to be small, infrequent, and limited to the construction period. In addition, pile driving, pile extraction, the use of a bubble curtain, and underwater wire-sawing will cause suspended sediment and increase turbidity. Because these actions will take place in a sandy substrate and will be limited to a small area and a brief portion of the work period, the increase in turbidity is expected to be small. However, fish close to the actions may experience abrasion to their gills and alteration in feeding and migration behavior.

Physical habitat alteration. The action will remove existing riparian and benthic habitat. Juvenile salmonids will experience a reduction of macroinvertebrate prey originating from benthic and riparian habitat, as well as macroinvertebrates likely to feed on or colonize allochthonous riparian plant materials. However, this effect is not likely to be significant since the area removed will be small in comparison to the action area, less than 10,000 square feet. As well, the loss of benthic habitat from the replacement structure will be in more swift and deeper mid-channel portions of the channel. Foraging by juvenile fish is expected to be low as well as the area is primarily a migration zone. Benefits will be realized through the completion of the action. The replacement bridges will have fewer structures in the channel that displace less area than the existing in-water structures, as well as move these bridge elements away from the near-shore and shallow water habitat to the mid-channel with deeper and faster water. While some of this habitat is still lost in the North Portland Harbor, the net increase to habitat available to fish for foraging and migration is approximately 3,000 square feet.

Juvenile and adult fishes' ability to use habitat, how they will use it, and the effects they subsequently experience will be altered by the presence of temporary and permanent structures that alter aquatic habitat. The direct effects include migration behavior modification and fish salvage, while indirect effects include predation.

Migration is likely to affected by the presence of temporary and permanent structure in the path of downstream migrating juveniles and upstream migrating adults. Juveniles have been shown to avoid and circumnavigate lines of shade cast by artificial structure. The use of work trestles, barges, and decks may cause juvenile fish to use habitat not usually used (*e.g.*, deep-water) and expose them to indirect effect including but limited to predation. As well, the path of individual migrating adults is likely to change as navigate around in-water structure causing them to use deep-water instead of shallow water habitat or vice versa depending on flows, species behavior, diurnal cycles *etc*. This may also cause them to slow or pause migration, causing them more vulnerable to predation as well. However, temporary and permanent structure will not occupy a large portion of the channel so its ability to alter migration is considered minimal.

Predation on juvenile salmon and steelhead is likely to increase due to the increase in over-water structure. The project will install multiple piles across the river crossing. Roosting by cormorants is likely, due to their affinity and need for above water structure to roost and dry-out. Without the ability to dry, they are unable to maintain buoyancy or warmth. This is of a concern since juvenile fish from all species migrate through the area. However, the FHWA and FTA have

proposed to minimize this effect by installing anti-perching devices to piles planned to be in place 6-months or longer. This and construction work is likely to partially dissuade use.

Northern pike-minnow (*Ptychocheilus oregonensis*), small-mouth bass (*Micropterus dolomieu*), and large-mouth bass (*Micropterus salmoides*) are also predators that consume juvenile salmon and occupy the river-channel. In addition, both species have an affinity for in-water structure such as multiple pile structures. As well, structure such as docks provide a sharp contrast (shade) to ambient light conditions increasing the opportunity of ambush predation upon juvenile salmonids and eulachon.

Both California and Steller sea lions use the action area including the project area. Alterations to adult eulachon and salmon behavior may make them more vulnerable to predation by these species. Changes in cover that congregate fish or cause them to slow or pause migration would likely attract sea lions and take advantage of the opportunity. While individuals of these species are likely to take advantage of such conditions it is not expected to increase predation rates across the run as these features would be small when in comparison to the channel and other ample similar opportunities exist, such as wing walls, throughout the lower Columbia River.

Predation has been identified as one of the limiting factors for all salmonid species in the Columbia River basin, except chum salmon (NMFS 2008g). Increased predator abundance may result from climate change (ISAB 2007). Predator species such as northern pikeminnow, and introduced predators such as largemouth bass, smallmouth bass, black crappie (*Pomoxis nigromaculatus*) white crappie (*P. annularis*) and, potentially, walleye (*Stizostedion vitreum*) (Ward *et al.* 1994, Poe *et al.* 1991, Beamesderfer and Rieman 1991, Rieman and Beamesderfer 1991, Pflug and Pauley 1984, and Collis *et al.* 1995) may use habitat created by in-water structures (Ward and Nigro 1992, Pflug and Pauley 1984) such as piers, float houses, floats and docks (Phillips 1990). Carrasquero (2001), in reviewing the literature regarding impacts of overwater structures, reports that smallmouth and largemouth bass have a strong affinity to structures; forage and spawn in the vicinity of docks, piers and pilings; and, largemouth and smallmouth bass are common predators of juvenile salmonids.

Major habitat types used by largemouth bass include vegetated areas, open water and areas with cover such as docks and submerged trees (Mesing and Wicker 1986). During the summer, bass prefer pilings, rock formations, areas beneath moored boats, and alongside docks. Colle *et al.* (1989) found that, in lakes lacking vegetation, largemouth bass distinctly preferred habitat associated with piers, a situation analogous to slack water areas of the lower Columbia River. Marinas also provide wintering habitat for largemouth bass out of mainstem current velocities (Raibley *et al.* 1997). Wanjala *et al.* (1986) found that adult largemouth bass in a lake were generally found near submerged structures suitable for ambush feeding. Bevelhimer (1996), in studies on smallmouth bass, indicates that ambush cover and low light intensities create a predation advantage for predators and can also increase foraging efficiency.

Pribyl *et al.* (2005), in studies on piscivorous fish in the lower Willamette River found that smallmouth bass were the most prevalent species captured. They found that smallmouth bass were found near beaches and rock outcrops more frequently in the winter and spring, and highly

associated with pilings regardless of the season. For largemouth bass, they found that they were found near pilings and beach sites in summer and autumn and near pilings, rock and beach areas during winter and spring. They also indicated that large sized predators were present at very low densities, but juveniles were fairly abundant. Smallmouth densities were highest in riprap, mixed riprap/beach and rock outcrop areas. Largemouth bass densities were low throughout the year, with riprap sites and alcoves being the highest density areas. Zimmerman (1999) and Sauter *et al.* (2004) both indicate that wild fall Chinook are the most vulnerable to smallmouth predation due to their smaller size during emigration.

Black crappie and white crappie are known to prey on juvenile salmonids (Ward *et al.* 1991). Ward *et al.* (1991), in their studies of crappies within the Willamette River, found that the highest density of crappies at their sampling sites occurred at a wharf supported by closely spaced pilings. They further indicated that suitable habitat for crappies includes pilings and riprap areas. Walters *et al.* (1991) also found that crappie were attracted to overwater structures.

Ward (1992) found that stomachs of northern pikeminnow in developed areas of Portland Harbor contained 30% more salmonids than those in undeveloped areas, although undeveloped areas contained more northern pikeminnow. Pribyl *et al.* (2005) found no fish in the stomachs of pikeminnow, but did find fish remains in the stomachs of smallmouth bass.

In addition to piscivorous predation, overwater structures also provide perching platforms for avian predators such as double-crested cormorants (*Phalacrocorax auritis*), from which they can launch feeding forays or dry plumage. Krohn *et al.* (1995) indicate that cormorants can reduce fish populations in forage areas, thus possibly affecting adult returns because of smolt consumption. Because their plumage becomes wet when diving, cormorants spend considerable time drying out feathers (Harrison 1983) on pilings and other structures near feeding grounds (Harrison 1984). Depending upon the final super-structure design the action may provide roosting areas for piscivorous birds.

Structure in the harbor is likely to provide resting and foraging habitat for piscivorous fish, able to prey on juvenile salmonids and adult and juvenile eulachon. Species such as large-mouth bass, northern pike minnow, and walleye pike reside in this portion of the river and are ambush predators in need of slower water velocities provided by in-water structure. While significant structure will occur in the main-stem Columbia River, velocities will remain in excess of these species needs. In addition, a reduction of prey quantity and abundance will occur through the displacement of benthic habitat. However, in higher order streams the food base is primarily pelagic including but not limited to copepods and zooplankton.

Eastern Steller sea lion. Eastern Steller sea lions may be present during the proposed in-water work windows from 2013 through 2021. As described above, the installation of steel sheet and pipe piles will elevate underwater sound in the action area. Sound pressure generated by this activity could injure or disturb Steller sea lions. NMFS is currently developing comprehensive guidance on sound levels likely to cause injury and behavioral disruption for marine mammals in the context of the Marine Mammal Protection Act and Endangered Species Act, among other statutes. Until formal guidance is available, NMFS uses the following thresholds of sound

pressure levels from broadband sounds that cause behavioral disturbance - 160 dBrms re: 1µPa for impulse sound and 120 dBrms re: 1µPa for continuous sound - and injury 190 dBrms re: 1µPa for pinnipeds (70 FR 1871).

Based on these thresholds, the FHWA and FTA anticipate that their proposed pile driving would produce sound pressure levels that could disturb or injure eastern Steller sea lions. To insure injury does not occur during project construction, the FHWA and FTA will implement a safety zone during all impact pile driving and during vibratory installation of 120-inch steel casings out to the 190 dB isopleths. FHWA and FTA will also slowly ramp up the initiation of pile installation. These ramp-up procedures provide added insurance to avoid injury of Steller sea lions. For example, in the unlikely event that a Steller sea lion is within the safety zone, but not visually detected, the ramp-up of sound levels will allow the Steller sea lion an opportunity to depart the immediate area prior to the onset of pressure levels that could cause injury. FHWA and FTA established the initial size of safety zones based on worst-case underwater sound modeling (30 feet and 177 feet for 18- to 24-inch and 36- to 48-inch steel piles, respectively, and 16 feet for 120-inch steel casing). FHWA and FTA will monitor the safety zone throughout impact pile installation and vibratory installation of 120-inch steel casings, and pile-driving operations will not initiate or will suspend if a Steller sea lion is detected approaching or entering the safety zone. The safety zone monitoring makes any potential injury of Steller sea lions extremely unlikely, and therefore discountable. FHWA and FTA do not anticipate that noise levels for vibratory installation of steel sheet or pipe piles will be above 190 dB, and therefore do not anticipate implementing a safety zone during vibratory pile driving, with the exception of installing 120-inch steel casings. Hydroacoustic monitoring of both impact and vibratory installation will confirm the anticipated sound levels. FHWA and FTA will use the actual SPL measurements from this monitoring to enlarge or reduce the size of safety zones, based on the most conservative SPL measurements.

Although the safety zone monitoring and shutdown procedures will avoid injury of eastern Steller sea lions, beyond this zone behavioral disruption may occur out to the 160 dB and 120dB isopleths for impact and vibratory driving, respectively. Based on conservative sound modeling, FHWA and FTA anticipate that noise from vibratory installation will not attenuate to the 120dB disturbance threshold before encountering land on the opposite shore and up and down river in either direction. Noise from impact installation is likewise anticipated to extend across the river to the opposite shore, but will attenuate to the 160 dB disturbance threshold both up and down river in closer proximity (within a river reach of 0.4 mile with an attenuation device and within 3.4 miles without an attenuation device).

FHWA and FTA estimated the number of annual eastern Steller sea lion exposures to sound levels above the disturbance thresholds in the project area during the years of in-water construction. They conservatively estimate that the number of individuals traveling up the lower Columbia River will be a three-fold increase above the largest minimum count in 2010 (an increase of this magnitude has occurred in the past year, and may continue). They further estimate that all individual Steller sea lions travelling past the project area will be exposed each time they pass the area and that all exposures would cause disturbance. NMFS agrees that this represents a worst-case scenario and is therefore sufficiently precautionary. Based on their

analysis, a combined total of up to 225 subadult and adult males per year and up to 6 repeat exposures per individual per year (three round trips each), or 1,350 total exposures per year could occur each year from 2013 to 2021. NMFS next considers the range of possible behavioral and other changes that such exposures could cause.

It is unlikely that eastern Steller sea lions exposed to sound levels above the disturbance thresholds will temporarily avoid traveling through the affected area. Steller sea lions en route to the Bonneville tailrace area are highly motivated to travel through the action area in pursuit of foraging opportunities upriver (NMFS 2008e). As stated in the Environmental Baseline section, Steller sea lions have shown increasing habituation in recent years to various hazing techniques used to deter the animals from foraging on sturgeon and salmon in the Bonneville tailrace area, including acoustic deterrent devices, boat chasing, and above-water pyrotechnics (Stansell *et al.* 2009). Many of the individuals that travel to the tailrace area return in subsequent years (NMFS 2008). Therefore, it is likely that Steller sea lions will continue to pass through the action area even when sound levels are above disturbance thresholds.

Although eastern Steller sea lions are unlikely to be deterred from passing through the area, even temporarily, they may respond to the underwater noise by passing through the area more quickly, or they may experience stress as they pass through the area. As described in the Environmental Baseline, Steller sea lions already move quickly through the lower river on their way to foraging grounds below Bonneville. Any increase in transit speed is therefore likely to be slight. Another possible effect is that the underwater noise will evoke a stress response in the exposed individuals, regardless of transit speed. However, the period of time during which an individual would be exposed to sound levels that might cause stress is short given their likely speed of travel through the affected areas. In addition, there would be few repeat exposures for the individual animals' involved (estimated six exposures per animal). Thus, it is unlikely that the potential increased stress will have an effect on individuals or the population as a whole.

Therefore, NMFS finds it unlikely that the amount of anticipated disturbance would significantly change eastern Steller sea lions' use of the lower Columbia River or significantly change the amount of time they would otherwise spend in the foraging areas below Bonneville Dam. Even in the event that either change was significant and animals were displaced from foraging areas in the lower Columbia River, there are alternative foraging areas available to the affected individuals. NMFS does not anticipate any effects on haulout behavior because there are no proximate haulouts within the areas affected by elevated sound levels. All other effects of the proposed action are at most expected to have a discountable or insignificant effect on Steller sea lions, including an insignificant reduction in the quantity and quality of prey otherwise available to Steller sea lions where they would intercept the affected species.

Additionally, the test pile program to commence prior to project construction will include a marine mammal monitoring plan. Under the plan, FHWA and FTA will monitor an area from the location of impact and vibratory pile installation and removal out to the isopleths where the applicable disturbance threshold would be reached (as initially estimated based on worst-case modeled distances described above). FHWA and FTA will not initiate or will suspend pile driving if they detect a eastern Steller sea lion within the monitoring area. The monitoring plan

makes it extremely unlikely, and therefore discountable that Steller sea lions will be exposed to sound pressure levels that could cause injury or disturbance.

Effects on Critical Habitat within the Action Area

Designated critical habitat within the action area for the ESA-listed Pacific salmon and steelhead considered in this Opinion consists of a freshwater rearing site and freshwater migration corridor and their essential physical and biological features as listed below. The effects of the proposed action on these features are summarized below as a subset of the habitat-related effects of the action that were discussed more fully above. The noise and water quality effects described will be short-term (minutes to weeks) during and immediately following in-water work involving pile driving.

Pacific salmon and steelhead.

1. Freshwater spawning sites
   a. Substrate. No effect.
   b. Water quality. *Direct* – Increased temperature, suspended sediment, and contaminants; decreased dissolved oxygen; and impoverished community structure, including the composition, distribution, and abundance of prey, due to increased upland erosion and runoff and channel disturbance. *Indirect* – More normal temperature and sediment load, reduced contaminants, and increased dissolved oxygen due to improved stormwater management; more normative community structure.
   c. Water quantity. No effect.
2. Freshwater rearing
   a. Floodplain connectivity. No effect.
   b. Forage. *Direct* – Decreased quantity and quality of forage due to increased suspended sediment and contaminants, decreased space, decreased dissolved oxygen, loss of habitat diversity and productivity, and impoverished community structure due to increased upland erosion and runoff and channel disturbance. *Indirect* – Increased quantity and quality of forage due to increased habitat diversity and productivity caused by improved stormwater management and more normative community structure.
   c. Natural cover. *Direct* – Decreased natural cover quantity and quality for predator refugia due to physical habitat alteration and increase in predator cover. *Indirect* – Return to approximately pre-construction conditions.
   d. Water quality. *Direct* – Increased temperature, suspended sediment, and contaminants; decreased dissolved oxygen; and impoverished community structure, including the composition, distribution, and abundance of prey, due to increased upland erosion and runoff and channel disturbance. *Indirect* – More normal temperature and sediment load, reduced contaminants, and increased dissolved oxygen due to improved stormwater management; more normative community structure.
   e. Water quantity. No effect.

3. Freshwater migration corridors
   a. Forage. As above.
   b. Free of artificial obstruction. *Direct* – Decrease due to decreased water quality and in-water work isolation. *Indirect* – Return to approximately pre-construction conditions.
   c. Natural cover. As above.
   d. Water quality. As above.
   e. Water quantity. As above.
4. Estuarine areas
   a. Forage. As above.
   b. Free of artificial obstruction. As above.
   c. Natural cover. As above.
   d. Salinity. No effect.
   e. Water quantity. As above.
   f. Water quality. As above.

Southern Green Sturgeon.

1. Freshwater riverine systems
   a. Food resources. *Direct* – Decreased quantity and quality of forage due to increased suspended sediment and contaminants, decreased space, decreased dissolved oxygen, loss of habitat diversity and productivity, and impoverished community structure due to increased upland erosion and runoff and channel disturbance. *Indirect* – Increased quantity and quality of forage due to increased habitat diversity and productivity caused by improved stormwater management and more normative community structure.
   b. Migratory corridor. No effect.
   c. Sediment quality. No effect.
   d. Substrate type or size. No effect.
   e. Water depth. No effect.
   f. Water flow. No effect.
   g. Water quality. *Direct* – Increased temperature, suspended sediment, and contaminants; decreased dissolved oxygen; and impoverished community structure, including the composition, distribution, and abundance of prey, due to increased upland erosion and runoff and channel disturbance. *Indirect* – More normal temperature and sediment load, reduced contaminants, and increased dissolved oxygen due to improved stormwater management; more normative community structure.
2. Estuarine
   a. Food resources. *Direct* – Decreased quantity and quality of forage due to increased suspended sediment and contaminants, decreased space, decreased dissolved oxygen, loss of habitat diversity and productivity, and impoverished community structure due to increased upland erosion and runoff and channel disturbance. *Indirect* – Increased quantity and quality of forage due to increased

habitat diversity and productivity caused by improved stormwater management and more normative community structure.

b. Migratory corridor. No effect.
c. Sediment quality. No effect.
d. Water flow. No effect.
e. Water depth. No effect.
f. Water quality. *Direct* – Increased temperature, suspended sediment, and contaminants; decreased dissolved oxygen; and impoverished community structure, including the composition, distribution, and abundance of prey, due to increased upland erosion and runoff and channel disturbance. *Indirect* – More normal temperature and sediment load, reduced contaminants, and increased dissolved oxygen due to improved stormwater management; more normative community structure.

Cumulative Effects

Cumulative effects are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02).

Although the CRC is intended to address a range of issues related to regional travel safety and mobility, and thus is likely to affect transportation patterns over time, the BA only identified one project likely to occur in the action area. That is the Vancouver Waterfront Access Project, also known as the Gramor Development Project, to redevelop the former 32-acre Boise Cascade site. Because this action involves waterfront development, it will require permits from the U.S. Army Corps of Engineers that will be subject to section 7 consultation under the ESA and EFH consultation under the MSA.

Projections to 2040 of population growth rates for the interior Columbia River basin range from 0.3 percent per year to 1.6 percent per year (McCool and Haynes 1996). If the largely migration-driven population growth continues unabated, it will result in a three to seven-fold increase in the population in the Columbia River basin region (Lackey *et al.* 2006).

This trend is likely to include rapid growth of human density in areas with recreational and scenic values adjacent to Federal lands, conflict between demands for fresh-water and needs for salmon, rapid urbanization and human density in areas previously sparsely populated, and land conversion from agriculture to urban uses (ISAB 2007). It will also include the positive effects of on-going regional and local salmon conservation and planning efforts that are underway to address all salmon species within the Columbia River basin, and will involve stakeholders on a more local level (Beamsderfer *et al.* 2010, LCFRB 2010).

Synthesis and Integration of Effects

Species at the Population Scale

ESA-listed Fish. Of 13 species and 189 independent populations and of ESA-listed Pacific fish that are likely to be adversely affected by this proposed action, and that have had a viability analysis completed, few are rated as "viable" and the overall risk of extinction varies from low (1 to 5% chance of extinction in 100 years) to very high (greater than 60% chance of extinction in 100 years). NMFS identified many factors as limiting the recovery of these species, most notably degraded habitat (especially floodplain connectivity and function, channel structure and complexity, riparian areas and large wood recruitment, stream substrate and streamflow), hatchery and harvest-related effects, and adverse effects related to mainstem hydropower development.

The NMFS designated critical habitat for all of the species considered in this opinion, except LCR coho salmon and eulachon, for which critical habitat has not been designated or proposed. Critical habitat for Steller sea lion does not have critical habitat designated within the action area. PCEs designated for Pacific salmon and steelhead include physical and biological features that support adult migration and juvenile rearing and migration. The lower Columbia River has been largely significantly altered by the effects of dam and reservoir development upstream, channelized, revetted, and stripped of large wood, thereby significantly diminishing both the complexity and productivity of aquatic habitats.

The environmental baseline within the action area includes a channelized mainstem with highly regulated streamflow, simplified channel habitats, and a river that is disconnected from its floodplain. Extensive development for residential, commercial and recreational use converted much of the shoreline to riprap with little relief, few trees, and many over and in-water structures. The proposed test pile program is in a relatively narrow and deep stretch of the Columbia River that does not provide slow water, shallow areas preferred by juvenile salmonids.

The effects of the proposed action that will have intermittent adverse effects on ESA-listed fish for a period of six years during construction are capture and release of individual fish during work area isolation, underwater noise created during pile driving, reduced water quality due to the construction effects of upland and in-water construction, and physical habitat alteration due to changes in overwater structure. The proposed action will also have adverse effects on ESA-listed fish for the design life of CRC due to reduced water quality from stormwater discharge and physical habitat alteration due to the final, as-built project footprint for the design life of CRC. The intensity, or magnitude, of each of these effects will be such that they are likely to injure or kill individual fish within the action area. Although the effects of impact pile driving are likely to be the most severe, those effects are limited to the construction period.

The CRC Team used the relationship between underwater noise due to pile driving (Table 24) and run timing and duration data for each species of Pacific salmon and steelhead and eulachon considered in this Opinion to evaluate the effects of CRC construction at the population level (Figure 7) (BA, Appendix K). Results of this analysis show that impact pile driving for CRC is

likely to have the largest effect on juvenile LCR Chinook salmon, CR chum salmon, and LCR coho salmon, and may injure or kill between 0.4 and 1.0% of the runs and life stages runs of those species over the construction period (Figure 7). All other runs and life stages are likely to have between 0.6 to less than 0.1% mortality over the construction period. Although this model was not able to assign those mortalities to individual populations, these levels are likely to be too low to reduce the abundance or productivity of any affected population because the construction phase of the action has a relatively short duration and adaptive management will be used during the construction phase to allow impacts to be reduced if harm occurs in excess of the estimated levels. Thus, NMFS does not expect CRC to exceed a reasonable level of mortality for Columbia River species when added to take other biological opinions (NMFS 2008d, 2008g, 2008i; Wagner 2011).

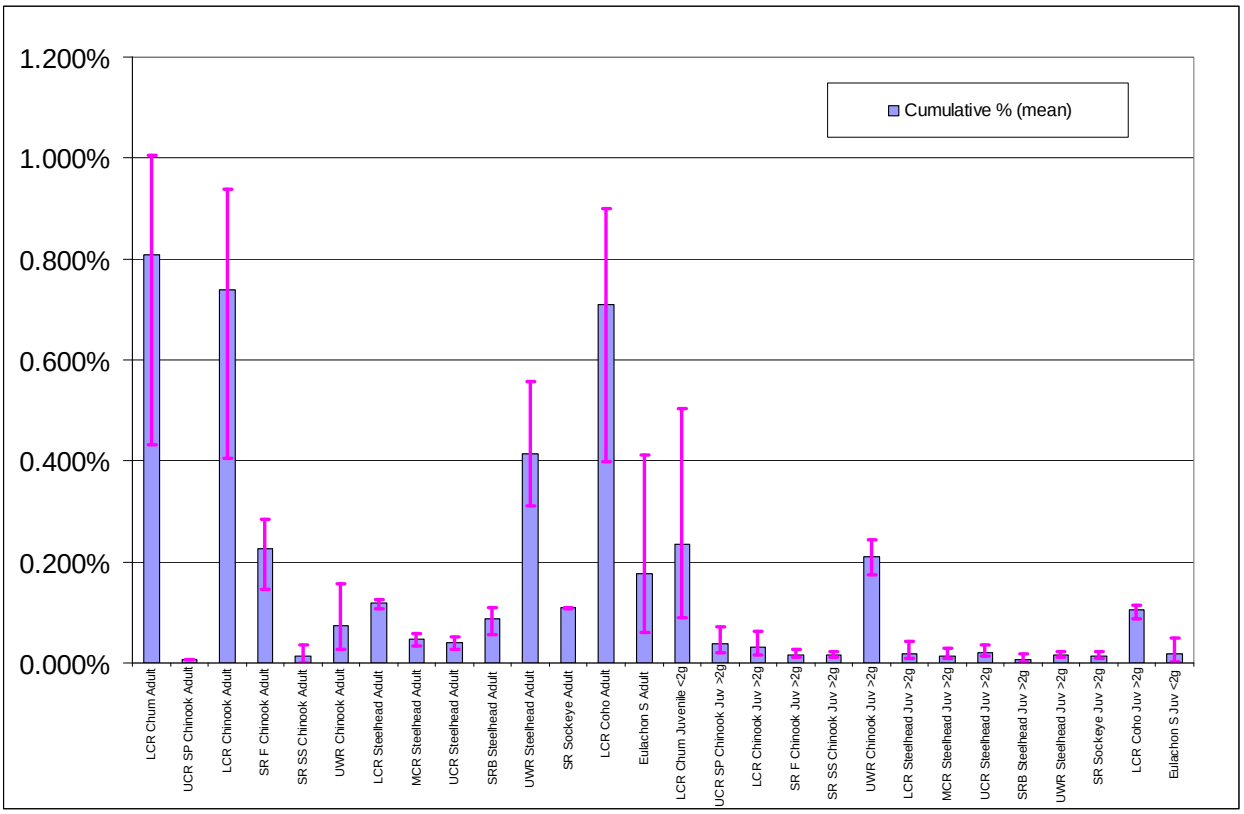


Figure 7. Mean cumulative percent mortality by species and life-stage due to the effect of impact pile driving for the proposed Columbia River Crossing project.

NMFS cannot accurately quantify the short and long-term habitat-related effects of this action that will occur in addition to the effects of pile driving because the precise distribution and abundance of adult and juvenile fish within the action area are not a simple function of the quantity, quality, or availability of predictable habitat resources within that area. Nonetheless, the relatively short-term adverse effects related to underwater noise (four years) and, to a lesser extent, to reduced water quality and physical habitat alteration (six years), caused by

construction or CRC are similar to impacts that created the currently degraded baseline conditions for ESA-listed species in the lower Columbia River. These effects are likely to displace juvenile and adult fish from their preferred habitat, reduce benthic prey production, reduce growth or reproductive rates, increase juvenile predation, delay out-migration, and modify migratory or rearing behavior. Modeling of the population-level effects pile driving, the primary source of impacts from CRC, shows that the magnitude and temporary duration of those effects will not increase the risk of extinction faced by these species. Over the long term, for the design life of CRC (50-80 years), stormwater runoff from the project footprint, a heavily used urban transportation corridor that now drains into the Columbia River essentially untreated, will be captured and treated using the best management practices available for removal of PAHs, heavy metals, and other relevant pollutants. Reducing levels of toxic contaminants in the estuary will improve both habitat capacity and the fitness level of individual ESA-listed fish.

These short- and long-term effects can be put into a recovery context using three recovery plans and an estuary module now under development for species considered in this Opinion (NMFS 2008h, Beamesderfer *et al.* 2010a, Beamesderfer *et al.* 2010b, ODFW 2010, LCRFP 2010), and a recovery plan has been completed for MCR steelhead in the IC Recovery Domain (NMFS 2009b). Each of those plans recommend measures to improve water quality, and better stormwater management in particular, as among the most potent and high priority recovery actions. Thus, the long-term contribution of CRC to comprehensive stormwater management and improved water quality is consistent with recovery actions indentified in recovery plans for the lower Columbia River and, combined with the likelihood that take will not exceed 1% of LCR species or 0.6% of all other species, it is unlikely that the proposed action will appreciably reduce the likelihood of survival and recovery of any listed species.

Eastern Steller Sea Lion. Eastern Steller sea lions have a large population, which over the past 30 years has increased approximately 3% per year. Steller sea lions are generalist predators, and able to respond to changes in prey abundance. There are no substantial threats to the species, and the final recovery plan identifies the need to initiate a status review and consider removing the Eastern DPS from the federal List of Endangered Wildlife and Plants (NMFS 2008c).

In recent years, as many as 53 subadult and adult male eastern Steller sea lions have travelled up the Columbia River past the project area en route to the tailrace area of Bonneville dam, where they forage on anadromous fishes. This number has increased at least two-fold in recent years, and the increasing trend may continue into the future. Individuals have exhibited an increasing tolerance for deterrence measures, including acoustic deterrence. The proposed installation of steel sheet and pipe piles will elevate underwater sound within a reach of the Columbia River, and sound pressure generated by this activity could injure or disturb passing Steller sea lions. Although the FHWA and FTA will implement a safety zone, monitoring and shutdown procedures as well as sound ramp-up procedures to avoid potential injury of Steller sea lions, the proposed project may result in as many as 636 exposures of Steller sea lions to sound levels above disturbance thresholds per year, each year from 2013 to 2021.

Eastern Steller sea lions are highly motivated to pass through the project area in order to forage in the tailrace area of Bonneville Dam. Additionally, Steller sea lions have habituated to directed deterrence activities, including acoustic deterrence in the tailrace area. Given these considerations, NMFS finds it unlikely that the amount of anticipated acoustic harassment in the project area would significantly change Steller sea lions' use of the Columbia River or significantly change the amount of time they would otherwise spend in the foraging area below Bonneville Dam. Even in the event that either change was significant and animals were displaced from foraging areas in the Columbia River, there are alternative foraging areas available to the affected individuals. Therefore, the proposed action is not likely to reduce the reproductive success or increase the risk of mortality for any individual Steller sea lions.

Critical Habitat at the Watershed Scale

The same effects of the proposed action that will have an adverse affect on ESA-listed fish and eastern Steller sea lions will also have an adverse affect on critical habitat PCEs for Pacific salmon and steelhead and southern green sturgeon, *i.e.*, underwater noise, water quality reduction, and increase in undesirable over-water structure. Together, these effects are likely reduce the conservation value of critical habitat PCEs for the rearing and migration corridor within the action area, particularly in the impact area for pile driving while that part of construction is taking place. However, those effects are too local and brief to affect the conservation value of the lower Columbia River, or any designated critical habitat, as a whole. Further, the long-term effects of CRC will include the addition of comprehensive stormwater management for the I-5 corridor and improved water quality throughout the lower Columbia River, outcomes with are consistent with actions indentified in recovery plans for the lower Columbia River. Thus, it is likely that critical habitat will remain functional and retain the current ability for PCEs to become functionally established, to serve the intended conservation role for the species.

Conclusion

After reviewing the status of LCR Chinook salmon, UWR Chinook salmon, UCR spring-run Chinook salmon, SR spring/summer run Chinook salmon, SR fall-run Chinook salmon, CR chum salmon, LCR coho salmon, SR sockeye salmon, LCR steelhead, UWR steelhead, UCR steelhead, MCR steelhead, SRB steelhead, southern green sturgeon, eulachon, and eastern Steller sea lion, the environmental baseline, the effects of the action, and cumulative effects, NMFS concludes that the proposed action will not jeopardize the continued existence of those species.

After reviewing the status of critical habitats of those species (with the exceptions of LCR coho salmon, for which critical habitat is not proposed or designated; eulachon, for which critical habitat is proposed but not designated; and eastern Steller sea lion, which does not have critical habitat designated in the action area) NMFS also concludes that the proposed action will not destroy or adversely modify critical habitat of those species.

For reasons explained in Appendix A of this Opinion, NMFS also concludes that the proposed action is not likely to adversely affect southern resident killer whales.

Incidental Take Statement

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by NMFS as significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the U.S. Fish and Wildlife Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not prohibited under the ESA, provided that such taking is in compliance with the terms and conditions of an incidental take statement.

The NMFS is not including an incidental take authorization for eastern Steller sea lions at this time because the incidental take of marine mammals has not been authorized under section 101(a)(5) of the Marine Mammal Protection Act or its 1994 Amendments. Following issuance of such regulations or authorizations, the NMFS may amend this biological opinion to include an incidental take statement for Steller sea lions.

Amount or Extent of Take

Actions necessary to complete the CRC will take place in the active channel of the Columbia River when LCR Chinook salmon, UWR Chinook salmon, UCR spring-run Chinook salmon, SR spring/summer run Chinook salmon, SR fall-run Chinook salmon, CR chum salmon, LCR coho salmon, SR sockeye salmon, LCR steelhead, UWR steelhead, MCR steelhead, UCR steelhead, SRB steelhead, eulachon, and southern green sturgeon are likely to be present.

The action area is used, in a small part, by CR chum salmon as a spawning area, by juveniles of all of these fish species for rearing and migration, by adults of all of fish these species for migration. The habitat that will be affected is rated as having high conservation value (NOAA Fisheries 2005) for each Pacific salmon and steelhead species considered in this consultation, although present conditions in the action area are degraded and the habitat that will be affected is not limited at the site or watershed scale.

Completion of the CRC is reasonably likely to cause the following type of incidental take of ESA-listed fish: 1) capture of juvenile fish during in-water work area isolation, some these fish will be injured or killed; and 2) harassment or harm of fish and sea lions due to the following habitat-related effects of CRC construction and operation: reduced water quality, barotrauma, and loss of benthic foraging habitats.

For this Opinion, the extent of take is defined as the area where the CRC action will: (1) Reduce water quality during construction and through stormwater discharge for the life of the CRC;

(2) produce harmful underwater noise during construction; and (3) convert benthic foraging habitat to less productive aquatic habitat types during construction and for the life of the CRC.

In the accompanying Opinion, NMFS determined that this level of incidental take is not likely to result in jeopardy to the listed species. Exceeding any of these indicators of take will trigger the reinitiation provisions of this Opinion.

Capture of Juvenile Fish during In-water Work Area Isolation. Take due to capture of juvenile fish during work area isolation will occur within the work area isolation site. Construction of the CRC will require two work area isolations. Each work area isolation is likely to result in the capture of 200 or fewer of the ESA-listed fish considered in this Opinion. Of the fish captured, less than 2% are likely to be injured or killed, including by delayed mortality, and the remainder are likely to survive with no long-term adverse effects. Thus, NMFS anticipates that up to 400 juvenile individuals of the ESA-listed fish species considered in the consultation will be captured, and less than eight are likely to be injured or killed because of work necessary to isolate in-water construction areas. Because these fish are from different species that are similar to each other in appearance and life history, and to unlisted species that occupy the same area, it is not possible to assign this take to individual species. NMFS does not anticipate that FHWA and FTA will take any adult fish in this manner.

Habitat-related Effects. Take caused by the habitat-related effects of this action cannot be accurately quantified as a number of ESA-listed fish because the distribution and abundance of fish and sea lions that occur within an action area is affected by habitat quality, competition, predation and the interaction of processes that influence genetic, population, and environmental characteristics. These biotic and environmental processes interact in ways that may be random or directional, and may operate across far broader temporal and spatial scales than are affected by the proposed action. Thus, the distribution and abundance of fish and sea lions within the action area cannot be attributed entirely to habitat conditions, nor can NMFS precisely predict the number of fish or sea lions that are reasonably certain to be injured or killed if their habitat is modified or degraded by the proposed action. As explained in the synthesis and integration of effects, NMFS estimates that the proposed action is likely to injure or kill an insignificant percentage of the affected populations.

Reduced water quality. Take caused by reduced water quality due to CRC construction activities will occur within 300 feet of the project site. Reduced water quality due to CRC also includes residual pollutants in stormwater runoff that discharge into the Columbia River after passing through the CRC stormwater facilities. These discharges mix with other pollutants in the lower Columbia River where they degrade food webs, reduce the growth and survival of juvenile fish, reduce the survival and fitness of adult fish, and contribute to a variety of additive and synergistic toxic effects throughout the lower Columbia River. Thus, take caused by reduced water quality due to stormwater runoff from CRC during operation will occur in a zone that extends from the project footprint to the confluence of the Columbia River with the Pacific Ocean.

The best available indicators for the extent of take due to reduced water quality are: (1) Turbidity released during construction; and (2) completion of the maintenance program used to maintain stormwater treatment facilities. The first variable is proportional to the amount of construction-related disturbance of upland and stream channel habitats that results in an erosion and suspended sediment in runoff and the water column. NMFS anticipates that these effects should not result in visible turbidity plume more than 300 feet from the project footprint. The second variable is completion of the stormwater maintenance program because that ensures that stormwater runoff from the CRC is receiving the planned level of treatment and consequently removing the identified types and levels of pollutants.

The best available indicators for the extent of take due to reduced water quality are: (1) No more than a 10% cumulative increase in natural stream turbidity 300 feet from an upland or in-water CRC construction activity, as measured relative to a control point immediately upstream of the turbidity causing activity, except for short-term emergency activities; and (2) regular and timely completion of the maintenance program used to maintain stormwater treatment facilities.

Barotrauma. Take due to barotrauma will occur in a zone between approximately RMs 101 and 119. The extent of take due to barotraumas caused by underwater noise is described by an area affected by the radius of underwater noise that will be created by impact driving an attenuated 48-inch pile, *i.e.*, for fish:

1. For all fish, behavioral disturbance, or auditory injury due to impulse sound from impact driving for approximately 66,000 feet upstream and 29,000 feet downstream within the radius where the RMS sound pressure level will exceed 150 dB re: 1 μPa^2.

2. For fish weighing less than 2 grams, external and internal hemorrhage, rupture of internal organs due to impulse sound from impact driving for approximately 3,250 feet upstream and downstream within the radius where cumulative sound exposure exceeds 183 dB re: 1 μPa^2•sec.

3. For fish weighing more than 2 grams, external and internal hemorrhage, rupture of internal organs due to impulse sound from impact driving for approximately 1,771 feet upstream and downstream within the radius where cumulative sound exposure level exceeds 187 dB re: 1 μPa^2•sec.

4. For all fish, external and internal hemorrhage, and rupture of internal organs for approximately 16 feet upstream and downstream where peak sound pressure level that exceeds 206 dB re: 1 μPa.

Benthic foraging habitat. The extent of take due to loss of benthic foraging habitat is described by the area permanently displaced by bridge columns, *i.e.*, 0.17 acre. Thus, the best available indicator for the extent of this loss is 0.17 acre.

Reasonable and Prudent Measures

The following measures are necessary and appropriate to minimize the impact of incidental take of listed species from the proposed action.

The FHWA and FTA shall:

1. Coordinate with NMFS to insure that completed project plans and updates specific to stormwater management, pile driving, in-water work area isolation, and containment are implemented and include comprehensive monitoring and reporting.

2. Minimize incidental take by applying contract conditions that avoid or minimize the project's adverse effects on aquatic habitats.

Terms and Conditions

The measures described below are non-discretionary, and must be undertaken by the FHWA or FTA for the exemption in section 7(o)(2) to apply. The FHWA and FTA have a continuing duty to regulate the activity covered by this incidental take statement. If the FHWA and FTA (1) fail to assume and implement the terms and conditions or (2) fail to require their grantees to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the FHWA and FTA must report the progress of the action and its impact on the species to the NMFS as specified below.

1. To implement reasonable and prudent measure #1 the FHWA and FTA shall ensure the following:

    a. NMFS Coordination will be regular and shall include an annual report coordination meeting (by June 15 annually) from the FHWA and FTA to discuss the report, and discuss conservation measure effectiveness and any necessary corrective actions. Other meetings will include the FHWA and FTA and their contractors (construction and design), to review the following design plans (30% completion) and reports when available:
        i. A stormwater management plan that addresses treatment of the project's contributing impervious area as described or referenced in the BA.
        ii. A pile-driving and underwater sound management plan.
        iii. In-water work area isolation plans for all in-water work areas.
        iv. Salvage notice. The following notice shall be included as part of the contract and be provided in writing to the general contractor and each subcontractor employed for in-water work:

            If a sick, injured or dead specimen of a threatened or endangered species is found, the finder must notify NMFS' Office of Law Enforcement at 503-231-6240 or 206-526-6133. The finder must take care in handling of sick

or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility for carrying out instructions provided by the Office of Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.

v. Annual program report. The FHWA and FTA shall submit a comprehensive annual program report to NMFS by June 1 each year, beginning following the test pile program and continuing until FHWA and FTA confirm that all site restoration is complete. These reports shall give NMFS information about the FHWA and FTA's efforts to carry out these terms and conditions throughout the preceding calendar year and must include the following information:

(1) The FHWA and FTA contacts for all monitoring and reporting.
(2) A summary of overall construction activity.
(3) A summary of coordination conducted with NMFS during the reporting period.
(4) A completed fish salvage reporting form for any project component that required fish capture and removal.
(5) The start and end dates for any in-water work.
(6) A summary of pile installation and removal activity, including the number, type and diameter of any pilings installed, removed, or broken during removal, and results of underwater noise monitoring.
(7) A summary of the results of pollution and erosion control inspections, including construction discharge water management, and any erosion control failures or contaminant releases and the subsequent corrections.
(8) A description of any riparian area cleared within 150 feet of ordinary high water, including the linear feet of bank alteration.
(9) A summary of any project components for which the FHWA and FTA confirm the completion of site restoration or compensatory mitigation.
(10) Any other data or analyses that FHWA and FTA deem necessary or helpful to assess impacts of the project actions on habitat trends.
(11) Annual monitoring reports shall be submitted to:

National Marine Fisheries Service
Oregon State Habitat Office
Attn: **2010/03196**
1201 NE Lloyd Boulevard, Suite 1100
Portland, OR 97232-2778

b. Full Implementation Required. Conservation measures and best management practices outlined in the BA and these terms and condition shall be included as enforceable provisions of the design-build contract. Failure to comply with all applicable conservation measures outlined in the BA, unless they conflict with provisions in these terms and conditions, and all terms and conditions included here may invalidate protective coverage of ESA section 7(o)(2) regarding the incidental take of listed species, and may lead NMFS to a different conclusion regarding the effects of the CRC project on listed species and designated critical habitats.

c. Failure to Provide Reporting May Trigger Reinitiation of Consultation. NMFS shall have the opportunity to conduct timely review and approval (where noted) of information identified above, and FHWA and FTA shall provide annual monitoring reports and participate in the annual coordination meeting, or NMFS may assume the CRC project has been modified in a manner and to an extent not previously considered and may recommend reinitiation of this consultation.

2. To implement reasonable and prudent measure #2 (avoid or minimize adverse effects of construction on aquatic habitats), the FHWA and FTA shall ensure the following:

a. In-water Work Timing. In-water work timing will occur by activity as follows:
   i. Impact pile driving will be completed between September 15 and April 15, unless FHWA and FTA demonstrate that sound levels will not equal or exceed the following values (re: 1 micropascal):
      (1) 206 dB peak SPL
      (2) 183 dB cumulative SEL between April 15 and July 31
      (3) 187 dB cumulative SEL between August 1 and September 15
      (4) 190 dB RMS at 164 feet from the pile year-round
   ii. Use of an impact hammer will be limited to daylight hours (beginning 30 minutes after civil sunrise and ending 30 minutes before civil sunset) at Pearson Airfield, to avoid peak movements of juvenile and adult Pacific salmon and steelhead.
   iii. Necessary underwater debris removal will occur between November 1 and February 28, using a clamshell bucket.
   iv. Construction and demolition may occur within the active channel year-round, provided that it does not because sound pressures that are injurious to fish, will not violate water quality standards established by ODEQ and WDOE.

b. Pile Installation. Pile installation shall be conducted as follows:
   i. When engineering limits do not require impact driving, piles shall be advanced by vibration, oscillation, rotation, or pressing.
   ii. During impact driving underwater sound attenuation shall be conducted as follows:
      (1) Completely isolate the pile from flowing water by dewatering the area around the pile while ensuring no physical contact between the pile and confinement vessel.

(2) if water velocity is 1.6 feet per second or less, surround the piling being driven by a confined or unconfined bubble curtain, as described in NMFS and USFWS (2006), that will distribute small air bubbles around 100% of the piling perimeter for the full depth of the water column.

(3) if water velocity is greater than 1.6 feet per second, surround the piling being driven by a confined bubble curtain (*e.g.*, a bubble ring surrounded by a fabric or non-metallic sleeve) that will distribute air bubbles around 100% of the piling perimeter for the full depth of the water column.

c. Underwater Noise Monitoring. An underwater noise monitoring plan for pile installation shall be developed and carried out as described in WDOT (2009), and shall be sufficient to analyze the effects of underwater noise produced by the full range of pile types, installation methods, and environmental conditions that are relevant to construction of the CRC project.

d. Fish Entrapment, Capture and Removal. The following measures shall apply to the treatment of fish in areas of in-water isolation:

i. Isolation will occur in such a manner as to promote fish emigration.

ii. Fish capture and removal shall occur in any isolation area before water quality conditions become unfavorable to fish.

iii. Capture and handling of fish shall comply with NMFS' electrofishing guidelines (NMFS 2000).

iv. A supervisory fish biologist experienced with work area isolation and fish capture will supervise the safe capture, handling and release of all fish and complete the fish salvage reporting forms.

v. Fish may be captured using a seine, electrofishing, or other method that maximizes efficiency and minimizes injury.

vi. Juvenile fish shall be released at a safe release site downstream of the work area; adults shall be released safely upstream.

e. Construction Discharge Water. The following measures shall apply to construction water discharges:

i. All discharge water created by construction (*e.g.*, concrete washout, pumping for work area isolation, vehicle wash water, shall be treated using the best available technology available (given site conditions) to remove debris, nutrients, sediment, petroleum products, metals and other pollutants.

ii. Pollutants such as green concrete, contaminated water, silt, welding slag, sandblasting abrasive, or grout cured less than 24 hours shall not contact any waterbody, wetland, or stream channel below ordinary high water.

f. Temporary Access Routes. The following measures shall apply to temporary access routes:

i. Temporary access routes for motorized equipment shall avoid steep slopes, where grade, soil, or other features suggest a likelihood of excessive erosion (*e.g.*, rills or gullies) or failure.

ii. When possible, construction vehicles shall use existing access routes that will minimize soil disturbance and compaction within 150 feet of any waterbody.
iii. When no longer needed, temporary access routes shall be obliterated, the soil stabilized and the vegetation restored.
iv. Temporary routes in wet or flooded areas shall be restored before the end of the applicable in-water work period.

g. Stationary Power Equipment, Vehicles, and Other Heavy Equipment. Generators, cranes, and any other stationary equipment operated within 150 feet of any waterbody. The following measures shall apply:
i. Equipment will be selected and operated as necessary to minimize adverse effects on the environment.
ii. All vehicles and other heavy equipment will be:
(1) Stored, fueled, and maintained in a vehicle staging area placed 150 feet or more from any waterbody, or in an isolated hard zone with suitable containment measures as outlined in the Spill Prevention, Control and Countermeasures (SPCC). Suitable hard zones include a paved parking lot, barge or work platform.
(2) Inspected daily for fluid leaks before leaving the vehicle staging area for operation within 50 feet of any waterbody.
(3) Steam-cleaned before operation below ordinary high water, and as often as necessary during operation to remain free of all external oil, grease, mud, and other visible contaminants.

h. Preconstruction Activity. Before significant alteration of the action area, contractors shall flag the boundaries of the clearing limits associated with site access and construction to minimize soil and vegetation disturbance, and shall ensure that all temporary erosion controls are in place and functional.

i. Site Preparation. The following measures shall apply to site preparation:
i. Native materials shall be conserved for restoration, including large wood, vegetation, topsoil and channel materials (gravel, cobble, and boulders) displaced by construction.
ii. Native materials shall not be disturbed unnecessarily.
iii. In temporary clearing areas, vegetation shall be clipped at ground level to retain root mass and encourage reestablishment of native vegetation.

j. Drilling and Boring. The following measures shall apply to drilling and boring. The FHWA and FTA shall insure that contractors shall:
i. Isolate drilling operations in wetted stream channels using a steel casing or other appropriate isolation method to prevent drilling fluids from contacting water.
ii. Use containment measures to prevent drilling debris from entering the channel.
iii. Isolate sampling and directional drill recovery/recycling pits, and any associated waste or spoils, from surface waters, off-channel habitats and wetlands.
iv. Cover all waste or spoils if precipitation is falling or imminent.

v. Recover and dispose, or recycle, all drilling fluids and waste to prevent entry into flowing water, off-channel habitats, and wetlands.

vi. Implement all possible efforts to contain drilling fluid or waste when visible in water or a wetland or a drilling casing breaks. Notify NMFS within 48 hours.

vii. Contain, recover, and recycle or dispose of all drilling equipment, drill recovery and recycling pits, and any waste or spoil produced, as necessary to prevent entry into any waterway. Contractors shall use a tank to recycle drilling fluids.

viii. Remove as much of the remaining drilling fluid as possible from the casing (*e.g.*, by pumping) to reduce turbidity when the casing is removed.

k. Pollution and Erosion Control. At any part of the project where there will be materials that are hazardous or toxic to aquatic life, such as motor fuel, oil, or drilling fluid, or where there will be earthwork that is likely to cause discharge of sediment into surface water, contractors must employ effective pollution and erosion control measures, including practices to:

i. Inventory, store, handle, and monitor any hazardous products or materials that will be used as part of the action.

ii. Contain and control a spill of those hazardous materials.

iii. Confine, remove, and dispose of excess concrete, cement, grout, and other mortars or bonding agents, including washout facilities.

iv. Avoid or minimize pollution and erosion at all roads, stream crossings, drilling sites, construction sites, borrow pits, equipment and material storage sites, fueling operations, and staging areas.

v. Prevent construction debris from dropping into any waterbody, and to remove any material that does drop with a minimum of disturbance.

vi. Avoid or minimize resource damage if the action area is inundated by precipitation or high streamflow.

vii. Stabilize all disturbed soils following any break in work unless construction will resume within seven days (May 1-September 30) or two days (October 1 – April 30).

l. Work Area Isolation Plan. At any part of the project, except for piling installation or removal, that involves excavation, backfilling, embankment construction, or similar work below ordinary high water where adult or juvenile listed fish might reasonably be to be present, or 300 feet or less upstream from spawning habitats, contractors must have a plan to ensure that area will be effectively isolated from the active stream. The plan shall:

i. Explain how the work area will be isolated and describe practices to ensure the area will remain effectively isolated throughout the range of flows likely to occur during construction.

ii. Include site sketches, drawings, specifications, calculations, or other information at a level of detail commensurate with the scope of the work area; and include contact information for the person responsible for designing this part of the action.

m. Stormwater Management. The FHWA and FTA shall have a Stormwater Management Plan applicable to stormwater runoff produced by the project's entire CIA. The Stormwater Management Plan shall ensure that stormwater runoff from that area will meet the pollution reduction and flow control requirements described below. The plan shall:

i. Explain how treatment facilities design will capture and remove pollutants from all contributing impervious areas (treatment basins), using site sketches, drawings, specifications, calculations, or other information at a level of detail commensurate with the scope of the work area. The explanation shall:

(1) Specify pollutants of concern and targeted for treatment

(2) Identify and all contributing and non-contributing impervious areas for the project area.

(3) Calculate the volume of stormwater runoff that produced from those contributing impervious areas by the design storm (0.86-in).

(4) Capture and treat a design storm defined as 50% of the 2-year, 24-hour storm as determined by a single event model; or 91% of the average annual runoff, as determined by a continuous flow model.

(5) Describe how stormwater will be treated using one or more of the following specific primary treatment practices and supplemented with appropriate soil amendments, as needed:

(a) bioretention
(b) bioslope
(c) infiltration pond
(d) porous pavement
(e) constructed wetlands
(f) vegetated and soil amended swale designed for infiltration
(g) a treatment train as described in FHWA (2002).

(6) Address unavoidable design constraints limiting successful implementation of the list of primary treatment practices through alternative methods demonstrating pollutant removal equivalency.

ii. Explain how treatment facilities design will capture and manage stormwater discharged into Burnt Bridge Creek, including a description of how flow control methods will achieve a pre-development hydrologic condition using design standards described in the Stormwater Management Manual for Western Washington (WDOE 2005).

iii. Explain how the engineered conveyance and treatment facilities will be maintained and operated. The explanation shall be a completed Maintenance and Operation Plan, and include:

(1) Pollutants of concern.

(2) Provide an inspection and maintenance schedule for each treatment facility.

(3) Identify expiration timelines of treatment media and require amendment and or replacement of treatment media needed to maintain engineered standards.

(4) Identify what FHWA and FTA are responsible for maintaining each engineered treatment facility.

iv. Stormwater Management Commitment Tracking. Coordinate every 6 months or prior to application for 401 Certification as identified by the Critical Path Method to insure that permanent stormwater treatment of the CIA is achieved to a level identified in the Opinion for the CIA and treatment for areas identified in the action as untreated is addressed. FTA and FHWA shall supply sufficient documentation for the aforementioned portions of the CIA, and NMFS will review to ensure consistency and compliance with this Opinion. This coordination process is to ensure the entire CIA shall have permanent stormwater treatment meeting the terms and conditions here in.

n. Site Restoration. Any part of the project that will result in a significant disturbance of riparian vegetation, soils, streambanks, or stream channel must have a post-construction restoration plan to ensure that disturbed areas meet the restoration requirements described below. FHWA and FTA will confirm when site restoration criteria are met.

i. Site restoration. Any part of the project that will result in a significant disturbance of riparian vegetation, soils, streambanks, or stream channel must have a post-construction restoration plan to ensure that disturbed areas meet the restoration requirements described below. FHWA and FTA will confirm when site restoration criteria are met. The post-construction site restoration plan shall consist of practices necessary to ensure that site restoration criteria, including:

(1) Restoring damaged streambanks to a natural slope, pattern and profile suitable for establishment of permanent woody vegetation.

(2) Replanting each area requiring revegetation before the first April 15 following construction with a diverse assemblage of species native to the project area or region, including grasses, forbs, shrubs and trees (noxious or invasive species may not be used); and reusing, when possible, the large wood, vegetation, topsoil and channel materials conserved during site preparation.

(3) Within reasonable limits of natural and management variation, restored upland sites should exhibit these characteristics:

(a) Continuing physical disturbance, if any, is confined to small areas necessary for access or other special management situations.

(b) Areas with signs of significant past erosion are completely stabilized and healed, bare soil spaces are small and well-dispersed.

(c) Soil movement, such as active rills and soil deposition around plants or in small basins, is absent or slight and local.

(d) Native woody and herbaceous vegetation, and germination micro-sites, are present and well-distributed across the site.

(4) Plants have normal, vigorous growth form, and a high probability of remaining vigorous, healthy, and dominant over undesired competing vegetation.
(5) Vegetation structure is resulting in rooting throughout the available soil profile.
(6) Plant litter is well-distributed and effective in protecting the soil with little or no litter accumulated against vegetation as a result of active sheet erosion ("litter dams).
(7) A continuous corridor of shrubs and trees appropriate to the site are present to provide shade and other habitat functions for the entire streambank.
(8) Streambanks are stable, well-vegetated, and protected at margins by roots that extend below baseflow elevation, or by coarse-grained alluvial debris.

Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal Agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. The NMFS has determined that the FHWA and FTA should implement the following discretionary measure to be consistent with this obligation:

> The FHWA and FTA should continue to develop and carry out plans to better equip their staff and partners with the skills, tools and resources necessary to support collaborative processes such as those used to good effect in the CRC project consultation, and extend them to other FHWA actions in Oregon. FHWA and FTA should also continue to support problem-solving during the ESA consultation process, develop accountability systems that align with higher expectations for collaboration, and to achieve and recognize the superior environmental outcomes that accrue through collaborative problem-solving efforts.

Please notify NMFS if the FHWA and FTA carry out this recommendation so that we will be kept informed of actions that are intended to improve the conservation of listed species or their designated critical habitats.

Reinitiation of Consultation

Reinitiation of formal consultation is required and shall be requested by the Federal agency or by NMFS where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (a) If the amount or extent of taking specified in the incidental take statement is exceeded; (b) if new information reveals effects of the action that may affect listed species or designated critical habitat in a manner or to an extent not previously considered; (c) if the identified action is subsequently modified in a manner that has an effect to the listed species or designated critical habitat that was not considered in the biological Opinion; or (d) if a new

species is listed or critical habitat is designated that may be affected by the identified action (50 CFR 402.16).

To reinitiate consultation, contact the Oregon State Habitat Office of NMFS, and refer to the NMFS Number assigned to this consultation: 2010/03196.

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The consultation requirement of section 305(b) of the MSA directs Federal Agencies to consult with NMFS on all actions, or proposed actions that may adversely affect EFH. Adverse effects include the direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitats, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects on EFH may result from actions occurring within EFH or outside EFH, and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires NMFS to recommend measures that may be taken by the action agency to conserve EFH.

The Pacific Fishery Management Council (PFMC) described and identified EFH for groundfish (PFMC 2005), coastal pelagic species (PFMC 1998), and Chinook salmon, coho salmon, and Puget Sound pink salmon (PFMC 1999). The proposed action and action area for this consultation are described in the Introduction to this document. The action area includes areas designated as EFH for various life-history stages of Chinook and coho. Based on information provided by the action agency and the analysis of effects presented in the ESA portion of this document, NMFS concludes that proposed action will have the following adverse effects on EFH designated for Pacific Coast salmon:

- Degradation of water quality required for rearing and migration in the lower Columbia River as described in the Opinion, above.
- Short and discrete alteration of under sound via pile-driving. The elevation of underwater sound will raise underwater sound preventing normal use by Chinook and coho salmon.
- Reduction of benthic habitat that prey species and reduces foraging opportunities.

Essential Fish Habitat Conservation Recommendations

The following two conservation measures are necessary to avoid, mitigate, or offset the impact of the proposed action on EFH. These conservation recommendations include a subset of the ESA Opinion's conservation recommendations and the ESA terms and conditions, and therefore NMFS recommends that FHWA implement the following from the ESA Opinion.

1. Minimize adverse effects due to elevated levels of underwater noise, reduced water quality, and physical habitat alteration associated with the structural footprint of the CRC bridges by applying conservation measures or BMPs for pile driving and construction,

except for fish salvage, as described in Term and Condition 1 in the accompanying Opinion.

2. Ensure completion of a monitoring and reporting program as described in Term and Condition 2 in the accompanying Opinion to confirm the action is meeting its objective of minimizing habitat modification from permitted activities.

The FHWA and FTA must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations [50 CFR 600.920(k)].

DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

Section 515 of the Treasury and General Government Appropriations Act of 2001 (Public Law 106-554) (Data Quality Act) specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section addresses these Data Quality Act (DQA) components, documents compliance with the DQA, and certifies that this Opinion has undergone pre-dissemination review.

Utility: Utility principally refers to ensuring that the information contained in this document is helpful, serviceable, and beneficial to the intended users.

The Opinion in this document concludes that the proposed Columbia River Crossing Project will not jeopardize the affected listed species. Therefore, the FHWA and FTA can fund this action in accordance with its authority under SAFETEA-LU. The intended users are the FHWA, ODOT, and WDOT.

Individual copies were provided to the FHWA, FTA, ODOT, and WDOT. This consultation will be posted on the NMFS Northwest Region website (http://www.nwr.noaa.gov). The format and naming adheres to conventional standards for style.

Integrity: This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, 'Security of Automated Information Resources,' Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

Objectivity:

Information Product Category: Natural Resource Plan.

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the ESA Consultation Handbook, ESA regulations (50 CFR 402.01 *et seq*.) and the MSA implementing regulations regarding EFH [50 CFR 600.920(j)].

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the Literature Cited section. The analyses in this Opinion/EFH consultation contain more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA and MSA implementation, and reviewed in accordance with Northwest Region ESA quality control and assurance processes.

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APPENDIX A. SOUTHERN RESIDENT KILLER WHALE DETERMINATION

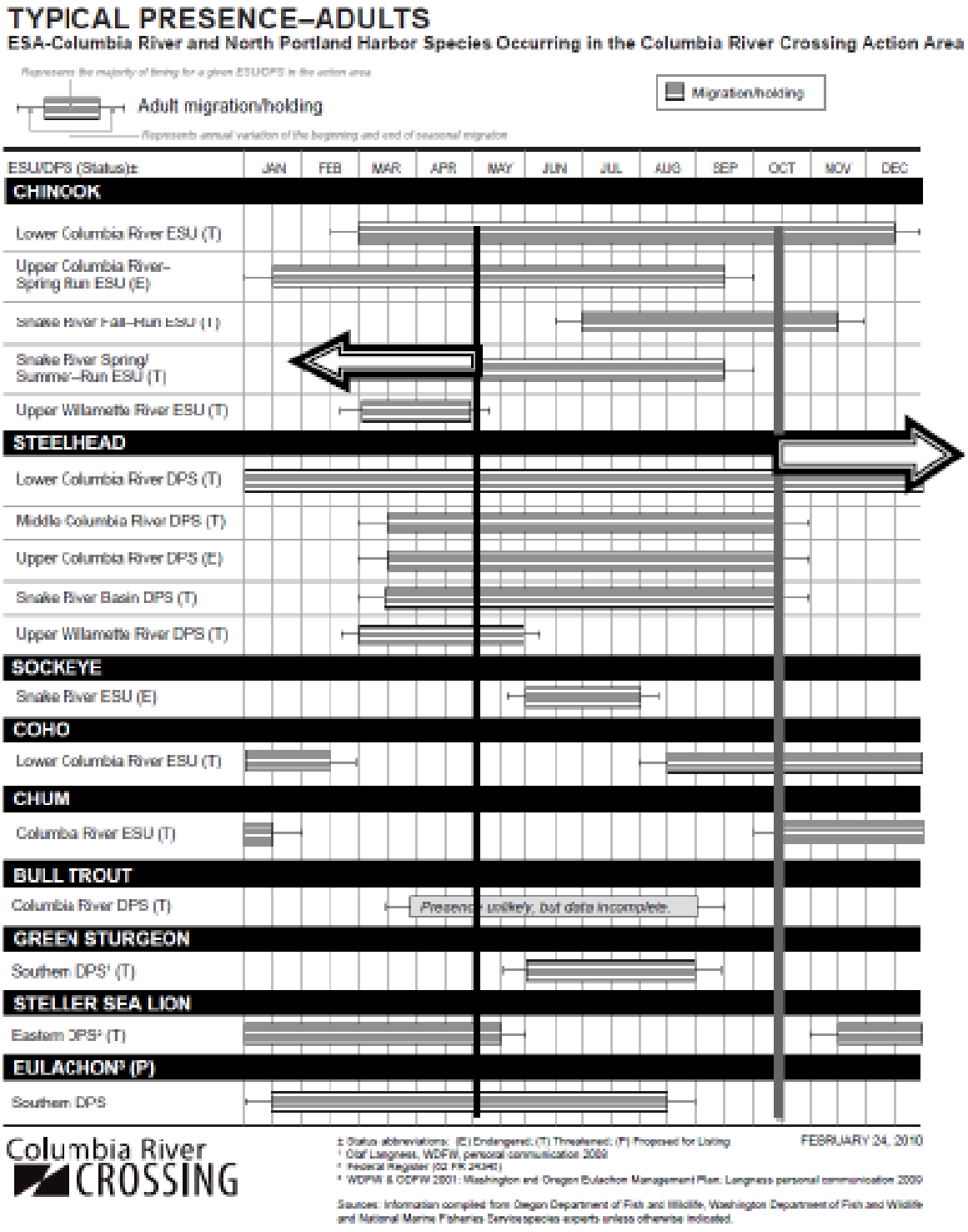
Southern Resident killer whales spend considerable time in the Georgia Basin from late spring to early autumn, with concentrated activity in the inland waters of Washington State around the San Juan Islands, and typically move south into Puget Sound in early autumn (NMFS 2008). Pods make frequent trips to the outer coast during this season. In the winter and early spring, Southern Resident killer whales move into the coastal waters along the outer coast from the Queen Charlotte Islands south to central California, including coastal Oregon and off the Columbia River (NMFS 2008). There are no documented sightings of Southern Resident killer whales in Oregon coastal bays. There is no documented pattern of predictable Southern Resident occurrence along the Oregon outer coast and any potential occurrence would be infrequent and transitory. Southern Residents primarily eat salmon and prefer Chinook salmon (NMFS 2008, Hanson *et al.* 2010).

NMFS finds that all effects of the proposed action will either cause no effect or are expected to be discountable, insignificant or beneficial (NLAA) for Southern Resident killer whales. The proposed action would take place in the Columbia River, where Southern Resident killer whales do not occur. Therefore, NMFS does not anticipate any direct effects on Southern Resident killer whales.

As stated above for Steller sea lions, the proposed action may affect the quantity of their preferred prey, Chinook salmon. Any salmonid take including Chinook salmon up to the aforementioned maximum extent and amount would result in an insignificant reduction in adult equivalent prey resources for Southern Resident killer whales that may intercept these species within their range.

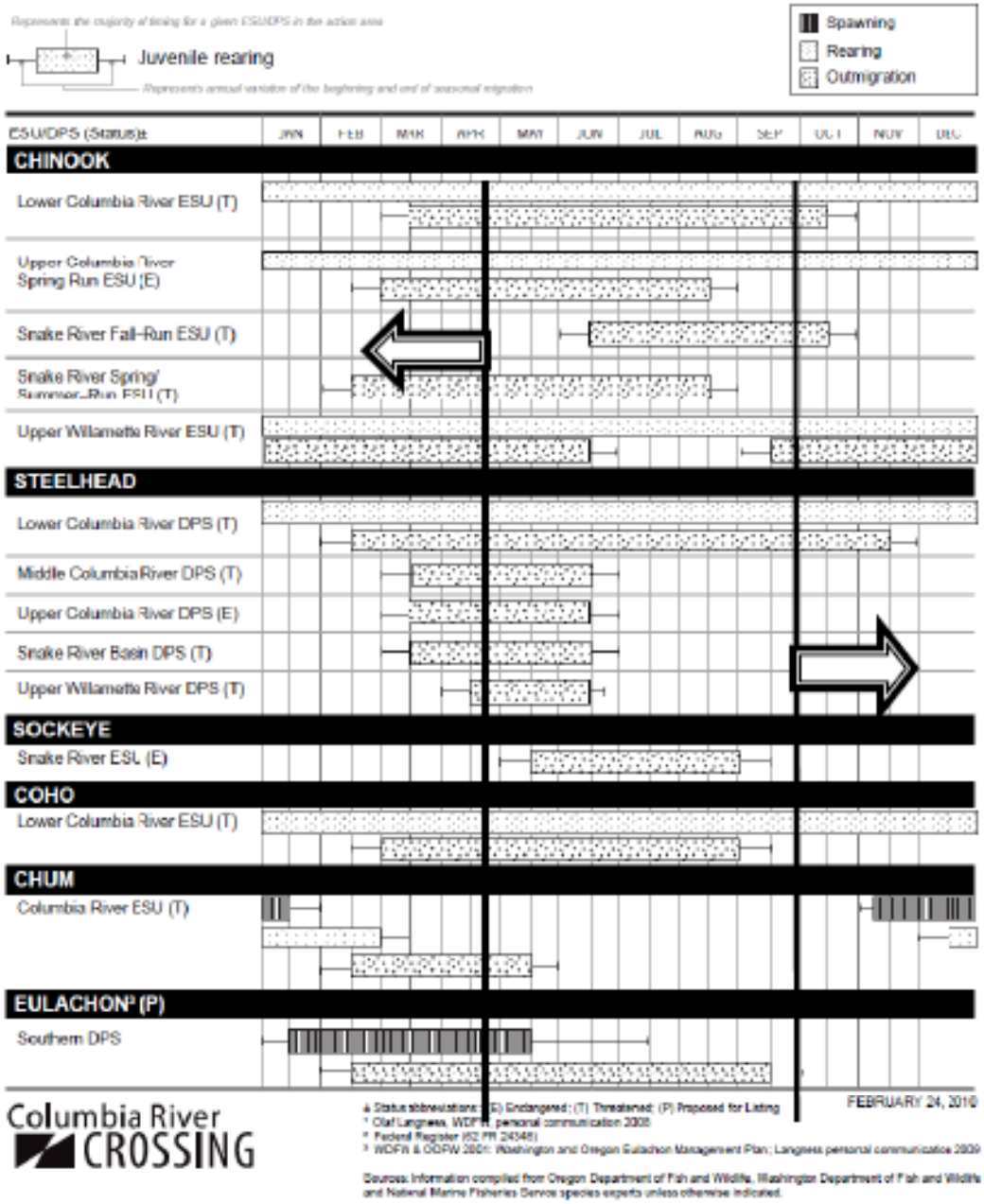
Therefore, NMFS finds that the proposed action may affect, but is not likely to adversely affect Southern Resident killer whales.

APPENDIX B. RUN TIMING AND PRESENCE OF LISTED FISH IN THE I-5/CRC



TYPICAL PRESENCE–JUVENILES AND LARVAE

ESA-Columbia River and North Portland Harbor Species Occurring in the Columbia River Crossing Action Area



Note: Timing of impact pile-driving = 

APPENDIX G

SECTION 106 MEMORANDUM OF AGREEMENT

MEMORANDUM OF AGREEMENT AMONG THE FEDERAL HIGHWAY ADMINISTRATION, THE FEDERAL TRANSIT ADMINISTRATION, THE UNITED STATES ARMY CORPS OF ENGINEERS, WASHINGTON STATE DEPARTMENT OF TRANSPORTATION, OREGON STATE DEPARTMENT OF TRANSPORTATION, WASHINGTON STATE DEPARTMENT OF ARCHAEOLOGY AND HISTORIC PRESERVATION, AND OREGON STATE HISTORIC PRESERVATION OFFICE

IMPLEMENTING SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT FOR THE COLUMBIA RIVER CROSSING, I-5 CORRIDOR BRIDGE REPLACEMENT PROJECT AND PUBLIC TRANSIT IMPROVEMENTS, CITY OF VANCOUVER, CLARK COUNTY, WASHINGTON, AND CITY OF PORTLAND, MULTNOMAH COUNTY, OREGON

WHEREAS, the Washington State Department of Transportation (WSDOT) and the Oregon State Department of Transportation (ODOT) plan to replace the Interstate 5 Bridge with a mix of bridge, public transit, highway and local street elements, and utility modifications, as part of the Columbia River Crossing Project (Project); and

WHEREAS, the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) are co-lead agencies that have and may, respectively, provide financial assistance for the Project. The United States Army Corps of Engineers (USACE) will be provided copies of all consultation documentation; and

WHEREAS, FHWA and FTA have determined that the Project is an undertaking, as defined in 36 CFR § 800.16(y), subject to review under Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 470f and its implementing regulations 36 CFR § 800; and

WHEREAS, FHWA and FTA have requested that WSDOT and ODOT initiate consultation with the Washington State Department of Archaeology and Historic Preservation (DAHP), the Oregon State Historic Preservation Office (ORSHPO), interested and affected Indian tribes, and other interested parties pursuant to 36 CFR § 800.14, on behalf of FHWA and FTA; and

WHEREAS, FHWA and FTA, in conjunction with WSDOT and ODOT, and in consultation with DAHP and ORSHPO and eleven consulting tribes, have defined the undertaking's Area of Potential Effect (APE); and

WHEREAS, FHWA and FTA consulted with DAHP and ORSHPO regarding appropriate levels of effort to identify historic properties in accessible areas of the APE, including inventorying 872 previously unrecorded built-environment historic resources, identifying 32 archaeological resources, preparation of oral histories by 2 consulting tribes, and evaluating historic significance of these resources resulting in the identification of 196 built environment and 32 archaeological historic properties eligible for listing on the National Register of Historic Places; and

WHEREAS, after assessing the direct, indirect and/or reasonably foreseeable adverse effects to historic properties, FHWA, FTA, WSDOT and ODOT, in consultation with DAHP and ORSHPO have agreed that the undertaking will have an adverse effect on the northbound I-5

Columbia River Bridge #18781, and the Vancouver National Historic Reserve (VNHR), which are listed on the National Register of Historic Places (NRHP), and the Pier 99 Building in Portland, which is eligible for listing in the NRHP; and

WHEREAS, FHWA and FTA were only recently made aware that the USS LCI-713, a historic WWII amphibious assault vehicle that is listed on the National Register of Historic Places, was moved within the project APE after the Built Environment survey was conducted, and although no adverse effects are expected, resolution of any adverse effects to the LCI-713 will be agreed upon under a separate Memorandum of Agreement; and

WHEREAS, FHWA and FTA have determined that the Project has the potential to adversely affect previously unidentified archaeological sites; but due to the large land areas under consideration, extensive areas within the APE containing deep sediments that are difficult to access and identify historic (archaeological) properties due to actively used development, engineering and design-level of constraints that prevent accurate assessment of adverse effects, private property access restrictions, and safety concerns regarding conducting archaeological investigations within an intensively developed and actively used urban context, further identification of historic properties, assessment of adverse effects, and resolution of adverse effects, if needed, shall be phased into the construction program in accordance with 36 CFR 800.4(b)(2), 36 CFR 800.5(a)(3) and 36 CFR 800.6(c)(6); and

WHEREAS, FHWA and FTA have notified the Advisory Council on Historic Preservation (ACHP) of FHWA's and FTA's adverse effect determination and the ACHP has chosen not to participate in the consultation; and

WHEREAS, FHWA and FTA have engaged in consistent and regular consideration of ways to avoid and minimize adverse effects to individual historic properties; and

WHEREAS, "signatories" means the required (FHWA, FTA, USACE, DAHP, ORSHPO, WSDOT and ODOT) and invited (National Park Service) signatories; "concurring parties" means consulting parties that have signed the Agreement, and "consulting parties" means signatories, concurring parties, all interested and affected tribes, and other interested parties consulted on the Project, regardless of whether they agreed to sign the Agreement; and

WHEREAS, TriMet, C-TRAN, the City of Portland, the City of Vancouver, and the Washington State Department of Natural Resources have been consulted regarding this Agreement and invited to concur in this Agreement; and

WHEREAS, the ten federally recognized tribes including the Confederated Tribes and Bands of the Yakama Nation, the Confederated Tribes of the Colville Reservation, the Confederated Tribes of the Grand Ronde Community of Oregon, the Confederated Tribes of the Siletz Reservation, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation, the Cowlitz Indian Tribe, the Nez Perce Tribe, the Nisqually Indian Tribe, the Spokane Tribe of Indians, (collectively "Indian tribes") have been consulted early in and throughout the section 106 process and invited to concur in the Agreement; and

WHEREAS, The Chinook Tribe, a non-federally recognized tribe, has been consulted early in and throughout the Section 106 process and invited to concur in the Agreement; and

WHEREAS, Fort Vancouver is a nationally and internationally significant site, containing the remains of the colonial capital of the Pacific Northwest from 1825-1860; a village whose inhabitants included Europeans, Native Hawaiians, and representatives of over 30 different American Indian tribes from homelands spanning the continent; and the region's first permanent U.S. Army post; and

WHEREAS Fort Vancouver was designated a National Monument on June 19, 1948 (62 Stat. 532) and redesignated, with expanded boundaries, as Fort Vancouver National Historic Site on June 30, 1961 (75 Stat. 196); and

WHEREAS the Vancouver National Historic Reserve was established in 1996 (Public Law 104-333, Section 502) and the National Park Service was named the lead partner for interpretation, education, and cultural resources management (Cooperative Management Plan, 2000); and

WHEREAS in order to bring the East and South Vancouver Barracks under the administrative jurisdiction of the National Park Service, the Secretary of the Army is relinquishing the East and South Barracks to the Department of the Interior; and

NOW, THEREFORE, FHWA, FTA, and USACE, WSDOT and ODOT, and DAHP and ORSHPO, agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties:

-STIPULATIONS-

FHWA and FTA, in cooperation with WSDOT and ODOT, will ensure that the following measures are carried out:

I. GENERAL REQUIREMENTS AND STANDARDS

A. As a condition of the award of any assistance under the Federal-Aid Highway and the New Starts 5309 Programs, FHWA and FTA shall require that WSDOT and ODOT carry out the requirements of this Agreement, and all applicable laws.

B. Signatories and Consulting Parties shall keep sensitive cultural resources information confidential to the extent allowed by state and federal law.

C. Activities carried out pursuant to this Agreement shall meet the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716 as revised) as well as existing standards and guidelines for historic preservation activities established by DAHP and ORSHPO.

D. FHWA, FTA, WSDOT, and ODOT will ensure that all cultural resources work carried out under this Agreement is conducted by or under the direct supervision of a person or persons meeting the Secretary of the Interior's Professional Qualification Standards (36 CFR 61). Non-cultural resources work mentioned in this Agreement will be carried out by Professionals in the appropriate field. WSDOT and ODOT shall communicate with consulting parties at the beginning, middle, and draft review of all mitigation materials, with a 30-day review period for comments.

E. All resource management documents as specified under this Agreement (e.g. the Archaeological Treatment Plan) will be completed prior to any construction and within three months of the release of the 90% design documents for the Project. Nothing in this Memorandum of Agreement (MOA) shall be construed as indicating acceptance by the concurring parties of the resource management documents, which have yet to be developed. WSDOT and ODOT shall in good faith attempt to reach a consensus on the contents of the resource management documents with the consulting parties. As the MOA functions in lieu of a state permit in Washington, all documentation generated will be provided to DAHP in accordance with State law.

F. FHWA and FTA shall retain ultimate responsibility for complying with all federal requirements pertaining to direct government-to-government consultation with Indian tribes. Notwithstanding any other provision of this stipulation, FHWA and FTA shall honor the request of any of the Indian tribes listed herein for direct government-to-government consultation regarding the Project. WSDOT and ODOT are authorized by FHWA to carry out, as their agents, Section 106 compliance activities, Section 4(f) of the Department of Transportation Act and tribal consultation. FHWA and FTA also agree that they have specific responsibilities and authorities in compliance with the National Environmental Policy Act, the Archaeological Resources Protection Act, the Native American Graves and Protection and Repatriation Act, the Historic Sites Act of 1935, the American Antiquities Act of 1906, the American Indian Religious Freedom Act, the Religious Freedom Restoration Act, Executive Order 13007 (Indian Sacred Sites), Executive Order 13287 (Preserve America), Executive Order 13175 (Consultation and Coordination with Indian Tribal Governments), and related authorities.

G. Within one month of signing the Record of Decision (ROD), FHWA and FTA shall inform all consulting parties that the ROD has been issued.

II. STIPULATIONS FOR MITIGATING ADVERSE EFFECTS TO SPECIFIC BUILT ENVIRONMENT HISTORIC PROPERTIES IN OREGON AND WASHINGTON

A. Columbia River (Interstate) Bridge NB (Oregon Bridge No. 1377A) 1917

The bridge was listed on the National Register of Historic Places on July 16, 1982, and will be adversely affected by its removal by the project. Previous Historic American Engineering Record (HAER) documentation on the bridge was completed in 1993.

1. WSDOT and ODOT will prepare a Bridge Marketing Plan that will ensure that all appropriate efforts will be attempted to find an alternative use including separating and relocating individual spans if relocation of the bridge in its entirety is not feasible (Deadline: within one year of ROD).

2. WSDOT and ODOT will obtain a Stipulation Letter from NPS detailing the appropriate level of HAER documentation to supplement the 1993 documentation. At a minimum, documentation will include the following (Deadline: within two years of the start of the project's final design):

a. HAER documentation consisting of a context statement; a minimum of 40 large format photographs that address both the nature of the overall structure and unique or character-defining features; aerial perspective photographs; and narrative documentation of distinctive attributes.

b. The HAER package will also include digital copies of available historic photographs, construction design plans, and as-built construction plan sheets held by ODOT, WSDOT, the Oregon Historical Society, and the Clark County Historical Society.

c. HAER documentation, including photographs and narrative, shall be filed at the following institutions: Library of Congress, DAHP, ORSHPO, Museum of History and Industry (Seattle), Fort Vancouver Regional Library, Multnomah County Library, the Clark County Historical Society, Oregon Historical Society, Architectural Heritage Center/Bosco Milligan Foundation (Portland), University of Washington Libraries – Special Collections Division, University of Oregon Libraries – Special Collections and University Archives, University of Oregon Allied Arts and Architecture Library, Portland State University Library – Special Collections, Clark College - Cannell Library, Stanley Parr Archives (Portland), and City of Vancouver Municipal Archives.

d. WSDOT and ODOT, in consultation with DAHP and ORSHPO, shall offer the large-format HAER photographs and narrative essays for display and interpretation to any of the following local museums, repositories, and public venues that confirm they wish to retain the materials: Fort Vancouver Regional Library, Multnomah County Library, the Clark County Historical Society, Architectural Heritage Center/Bosco Milligan Foundation, Vancouver and Portland City Halls, Port of Portland, the Washington and Oregon State Libraries, the Fort Vancouver National Historic Site , and the Washington and Oregon State Archives.

3. Decorative or interpretive structural elements, such as the historic entry pylons, will be incorporated into the bridge design, light rail stops near the bridge, or parks; or offered to local historical societies/museums or other interested parties (Deadline: within two years of bridge removal).

4. WSDOT and ODOT, in consultation with DAHP and ORSHPO, the cities of Portland and Vancouver, and interested tribes will develop and install or implement professionally-designed interpretive programs that will communicate the structure's history and meaning to the general public. Professionally printed materials will be distributed at local museums and heritage organizations for the duration of the Project. The types of materials that will be prepared may include: contemporary photographs from the HAER documentation and historic photographs, quotations derived from the HAER research and oral history interviews, and a map of early-20th century attractions, including historic structures and important places located within the project's APE (Deadline: within two years of the start of the project's final design).

5. WSDOT and ODOT, in consultation with DAHP and ORSHPO and the cities of Portland and Vancouver, shall create and maintain a professionally-built website that will provide an historical interpretation of the role played by the I-5 bridges including display photographs, peer reviewed essays, oral interviews, maps, and background materials highlighting the significance of the river crossings and highway. The website will be designed to accommodate new information that may be prepared as mitigation for future adverse effects to historic properties, resulting from this undertaking. WSDOT and ODOT shall create the website within three years of the signing of this MOA, and maintain the website for the duration of the Project. At the completion of the project, the website will be offered to the Washington State Archives' digital library and/or HistoryLink.org, and the Oregon State Library digital archives and/or oregonencyclopedia.org for subsequent continued display. The website will include a selection of the following (Deadline: within two years of the start of the project's final design):

    a. Explanatory materials about the I-5 bridges and its context within Portland, Vancouver, Pacific Highway, and Columbia River history,

    b. Selected HAER photographs, essays derived from the HAER narrative report,

    c. Visual simulation or animation videos using existing LiDAR and other electronic media; and

    d. A webpage dedicated to educational materials and activities for children, to be created in consultation with educators from Portland and Vancouver.

    e. WSDOT and ODOT shall contact educational, public and non-profit organizations interested in Portland and Vancouver history and historic preservation, including, but not limited to, the Cities of Vancouver and Portland, Clark County, the Washington Trust of Historic Preservation, and the Architectural Heritage Center/Bosco-Milligan Foundation and shall inform them of the ability to link to this website.

6. ODOT, in consultation with ORSHPO, will develop a Multiple Property Documentation for the remaining bridges along the old Pacific Highway in Oregon. One individual nomination for a notable resource will be developed and submitted to ORSHPO for review, and NPS for review and listing (Deadline: within two years of the start of the project's final design).

7. WSDOT, in consultation with ODOT, DAHP and the Oregon SHPO, will revise and update previous Multiple Property Documentation for bridges constructed in Washington and determined eligible for the National Register of Historic Places. For bridges where there is local support for listing, and no immediate plans for demolition, individual nominations will be developed for at least one structure. These nominations will be submitted to DAHP for review, and to NPS for review and listing (Deadline: within two years of the start of the project's final design).

B. The Pier 99 Building

The Pier 99 Building has been determined eligible for the National Register of Historic Places and will be adversely affected. Given the structural design and condition of the building, there is little likelihood that the structure can be relocated. ODOT will mitigate the adverse effect by ensuring the following measures are implemented and completed:

1. ODOT will obtain a Stipulation Letter from NPS detailing the appropriate level of Historic American Buildings Survey (HABS)/HAER documentation. At a minimum, documentation will include the following (Deadline: within two years of the start of the project's final design):

    a. HABS/HAER documentation consisting of a context statement; a minimum of 20 large format photographs that address both the nature of the overall structure and specifically the details of the hyperbolic, butterfly roof and supporting structures; aerial perspective photographs; and narrative documentation of distinctive attributes.

    b. The HABS/HAER package will also include digital copies of all available historic photographs collected and held by either DOT.

    c. HABS/HAER documentation, including photographs and narrative, shall be filed at the following institutions: Library of Congress, ORSHPO, Multnomah County Public Library, the Oregon Historical Society, the Architectural Heritage Center/Bosco Milligan Foundation, University of Oregon Library – Special Collections and University Archives, University of Oregon Allied Arts and Architecture Library, Portland State University Library- Special Collections, Stanley Parr Archives (City of Portland), and ODOT's Central Services library in Salem.

    d. ODOT, in consultation with ORSHPO, shall offer and provide the large-format photographs and narrative essays for display and interpretation at one or more of the following local museums, repositories, and public venues: Multnomah County Public Library, the Oregon Historical Society, the Architectural Heritage Center/Bosco Milligan Foundation, Portland City Hall, Port of Portland, the Oregon State Library, and the Oregon State Archives.

2. If appropriate, decorative or interpretive building elements will be offered to local historical societies/museums, then offered to architectural recycling companies before demolishing the building completely (Deadline: within one year of building removal).

3. ODOT, in consultation with ORSHPO and the city of Portland, will develop a professionally-designed interpretive project that results in the documentation of the structure's history and meaning to the general public (e.g. in a pamphlet on the immediate area's mid-century architectural resources). This information will highlight mid-century, modern engineering and architecture, including the Pier 99 building, as well as the social, economic, and cultural trends of mid-20th century with an emphasis on the regional impact of this period's architecture and engineering. These professionally researched, written and printed materials will be offered at the following local museums and heritage organizations for the

duration of construction: ORSHPO, Multnomah County Public Library, the Oregon Historical Society, the Architectural Heritage Center/Bosco Milligan Foundation, Portland City Hall, Portland International Airport, the Oregon State Libraries, and the Oregon State Archives (Deadline: within two years of the start of the project's final design).

4. ODOT, in consultation with ORSHPO and the city of Portland, will develop a Multiple Property Documentation for postwar boat and automobile dealership showroom buildings in the greater Portland area. Individual nominations will be developed for at least one notable postwar resource. These nominations will be submitted to ORSHPO for review, and to NPS for review and listing (Deadline: within two years of the start of the project's final design).

C. Vancouver National Historic Reserve Post Hospital

The hospital is part of the Army quarters of the VNHR and is a contributing structure within the National Register Historic District. The immediate area around the hospital is part of the Army Parade Grounds and Barracks Cultural Landscape at the Reserve. The increased proximity of the proposed retaining wall and roadways constitute an adverse effect to this resource. Additionally, NPS and City of Vancouver staff have expressed concerns about the potential that construction related activities may cause vibration impacts of an adverse nature.

1. Landscaping elements of the Lid, a freeway cover in front of the Hospital which will be constructed as part of the project, will mitigate the increased proximity of the proposed retaining wall and highway**.** These landscape elements will be a partnership between WSDOT, NPS, and City of Vancouver. WSDOT will consult and coordinate design with appropriate parties at NPS and City of Vancouver (Deadline: design within two years of the start of the project's final design).

2. To ensure protection of the hospital buildings structural and material integrity, WSDOT, in Consultation with the NPS and the City of Vancouver, will develop a Construction Vibration and Settlement Management and Monitoring Plan that will (1) define a pre-construction analysis of vibration and settlement analysis to determine effect thresholds and appropriate measures that might be needed to minimizes vibration and settlement risks during construction; (2) define vibration and settlement monitoring and analysis methods to be used during construction and protective response procedures if adverse effects to structural and/or material integrity occur and/or appear imminent (Deadline: prior to start of construction of the project).

D. Vancouver National Historic Reserve

The entire VNHR is a National Register Historic District that has four distinct cultural landscapes as substantial components of its significance. WSDOT will coordinate with NPS and City of Vancouver to develop a Visual Management Plan or work with visual elements of an existing VNHR management plan addressing visual effects, to ensure that all project design elements are consistent and compatible with

VNHR goals and that take into account the historic property's qualifying characteristics, especially the aspects of integrity regarding setting and feeling.

1. WSDOT will consult and coordinate with DAHP, NPS, City of Vancouver, and interested tribes to design and install an aesthetically appropriate noise wall structure. The noise wall will stretch from the Land Bridge to the southern edge of the Post Hospital, where the City of Vancouver prefers the noise attenuation provided by the Lid (Deadline: installation of structure shall be completed by completion of the project).

2. As mitigation for impacts to cultural resources, WSDOT will provide funding for the design and the renovation of Building 405 into a fully-operational curation facility which will meet federal standards for curation as defined in 36 CFR Part 79 and as promulgated by National Park Service policy for a NPS museum/curatorial facility. WSDOT has reviewed the building conceptual design (Appendix A), which is consistent with NPS policy, and agree to fund the renovation based on this concept. Within 60 days of the start of the project's final design, WSDOT, in consultation with NPS, will fund design of the facility through construction documents, producing a Class A construction cost estimate for the museum facility. The Class A construction cost estimate, with appropriate contingencies, will be used to determine the funding level to be transferred to the NPS for the renovation of building 405 when the CRC project construction begins (not to exceed $16.9 million based on the construction of the curation facility beginning in March 2013). All improvements will be the property of the NPS.

E. Light-Rail Noise Impacts

Along 17th Avenue, project noise levels are predicted to meet, or exceed the FTA criteria at 20 single-family residences. Of these, four have been determined NRHP eligible:

DAHP ID	Address
116	307 E 17th Street
129	404-406 E 17th Street
119	415 E 17th Street
133	604 E 17th Street

Mitigation for light rail noise impacts include sound barriers, track lubrication at curves, and other features designed into the infrastructure itself as well as residential sound insulation. Building retrofits are considered on a case-by-case basis and determined during the final design stage. In coordination with DAHP, the proposed modifications for these four NRHP-eligible houses, will be reviewed for consistency with the Secretary of the Interior Standards for Rehabilitation (Deadline: Prior to Light Rail construction).

III. PRINCIPLES AND STIPULATIONS TO COMPLETE ARCHAEOLOGICAL INVESTIGATIONS

FWHA and FTA in conjunction with other signatories and concurring parties have agreed that the complexities of the CRC project require a phased approach to the completion of compliance with 36 CFR 800. Circumstances dictate that some of the activities needed to complete all steps of the Section 106 process will be carried out after the ROD is issued.

A. Archaeological Survey of Remaining Parcels and Other Areas

1. An archaeological survey of the remaining unsurveyed parcels will be completed after those parcels (or rights of entry to those parcels) have been acquired by the DOTs, but prior to project construction.

2. The survey will include subsurface investigations comparable to the surveys previously completed for the undertaking, and will be conducted by or under the direct supervision of a person or persons meeting the Secretary of Interior's Professional Qualification Standards.

3. An addendum cultural resources technical report, consistent with DAHP and ORSHPO guidelines for such documents, will be prepared for all additional archaeological survey work completed under this MOA. The report(s) will be submitted to DAHP, ORSHPO, and consulting tribes for review.

4. Archaeological investigations, including subsurface testing where appropriate, will be conducted on State Owned Aquatic Lands about 200 feet to each side of the existing bridge on the Washington shore; the report will be submitted to WDNR, DAHP, and consulting tribes for review.

5. Archaeological investigations will be conducted within the light-rail corridor and facilities, which are located in actively used streets that will likely be inaccessible to investigation until immediately prior to or during construction.

6. Archaeological investigations will be completed in Oregon, which are constrained by the extensively developed nature of the project area as well as the depth of the Holocene flood deposits, which necessitate employing rotosonic cores to search for buried deposits.

7. If archaeological survey of any remaining parcels prior to construction remains unfeasible due to safety concerns, depth, or construction techniques, then archaeological monitoring of those parcels will be employed during construction if the area has a moderate or high probability to contain significant archaeological resources.

IV. SIGNIFICANT ARCHAEOLOGICAL RESOURCES

The Project area spans two very different environmental and historical contexts, which necessitated two different methods for archaeological discovery. Archaeological research designs were written, and discovery excavations have been completed for the work areas where access was secured by the Project. On the Washington side, Holocene deposits are

thin and archaeological remains are relatively close to the surface. The studies identified 32 historical archaeological resources in Washington that meet NRHP criteria. In Oregon, the project extends across the Columbia River floodplain with alluvial deposits in excess of 30 m (100 feet) deep. Although no archaeological deposits were discovered, a paleoenvironmental model will be created to guide the search for possible significant prehistoric archaeological resources within identified target areas. Based on the design parameters, buried conditions, and construction methods, it is possible that some resources may not be accessible for data recovery mitigation measures. All plans as specified below will be developed in consultation with consulting parties prior to any construction activity. Consideration of significant resources shall be addressed by the following actions.

A. Preparation of Archaeological Resources Treatment Plans (Treatment Plan)

Significant archaeological resources have only been found in Washington to date, so the Treatment Plan will only address those resources. If archaeological resources are discovered in Oregon, a separate Treatment Plan will be developed for work in Oregon. The Treatment Plan will guide the actions of cultural resources professionals during its implementation. WSDOT and ODOT shall develop the plans in consultation with DAHP and ORSHPO, interested and affected tribes, and other consulting parties, making a good faith effort to reach consensus on the contents of the Treatment Plan. As the MOA/Treatment Plan functions in lieu of a state permit in Washington, all documentation generated will be provided to DAHP in accordance with State law. The plan shall:

1. Evaluate and describe the location-specific Project actions that have a potential to affect significant archaeological resources including:

    (i) The nature of the actions (excavation, cast piles, etc.); and

    (ii) Probable effects relative to resource potentials;

2. Discuss in detail appropriate treatments (possibly including integrated rapid data recovery, monitoring, alternative mitigation measures, or other measures) and how they will be applied to the identified Project actions. This discussion will include specific proposals and methods for an integrated rapid data recovery for areas where construction activity encounters previously unidentified cultural deposits. Mitigation for impacts to sites considered significant under criterion A, B, and C will include support for interpretive programs, including panels, exhibits, and educational materials; or other mitigation as appropriate to the historic property.

3. Establish criteria that trigger further consultation with DAHP and ORSHPO, interested and affected tribes, and other consulting parties, and evaluation of archaeological resources identified during construction (for example, intact features and artifacts related to prehistoric Native American use);

4. Describe methods that will be used to recover and process archaeological materials and information that are deemed NRHP-eligible including:

(i) The different methods proposed to recover different types of site assemblages (for example, appropriate methods for Native American sites vs. historic sites);

(ii) Potential specialty or analytical methods that may be applied to recovered resources (e.g., C-14 dating, faunal analysis, flotation, trademark identification and dating, etc.);

(iii) Artifact processing parameters and laboratory procedures that will permit relevant study and reporting;

5. Outline anticipated reporting requirements, realizing that reporting specifics are dependent on the nature of the resources that are recovered by Project actions. An appropriate timeframe for analysis and reporting will be negotiated with consulting parties after completion of fieldwork activities and will be dependent on the nature and extent of recovered archaeological information, not to exceed five years from the completion of construction;

6. Identify requirements and process approaches for final curation of artifacts and information associated with any data recovery actions. All documents and artifact generated in Washington will be curated at the NPS Fort Vancouver National Historic Site Museum Facility in Vancouver, Washington. Documents and artifacts generated in Oregon will be curated at the Oregon State Museum of Natural and Cultural History in Eugene, Oregon; and

7. Discuss measures that will be taken to disseminate findings to the general public.

B. Preparation of an Inadvertent Discovery Plan

WSDOT and ODOT will revise, in consultation with DAHP and ORSHPO, tribes and other consulting parties, a previous Inadvertent Discovery Plan (IDP) from 2009 that addresses archaeological resources not previously identified in the Treatment Plan, and the treatment of human remains, if discovered. Their primary purpose is to provide procedural guidance to Project supervisors and contractors regarding actions associated with construction, and to establish the formal process and notification responsibilities of relevant parties (Deadline: Prior to construction)..

C. Additional Mitigation Measures and Public Education

The Secretary of the Interior's Standards for Archaeological Documentation mandates that "the results of archaeological documentation are reported and made available to the public" (48 CFR 44734). Therefore, WSDOT and ODOT shall:

1. Disseminate the findings of the archaeological investigations as developed under the Treatment Plan and in consultation with DAHP and ORSHPO, interested and affected tribes, and other consulting parties. Methods shall include one or more of the following:

(i) A reader-friendly summary of information gleaned on history (including above ground resources) and/or prehistory through the data recovery process;

(ii) A museum-quality display or displays that could be showcased at local, state or tribal government facilities, and offered to local museums on a rotating basis;

(iii) Use of non-diagnostic or unprovenienced historical artifacts (non-grave goods) may be used to develop a traveling informational toolkit for use in public and private schools and at Tribal facilities. Replications of artifacts may be commissioned for inclusion in the traveling toolkit.

2. Develop a guidance document for future development by others in the vicinity of the Project based on the insights gleaned from the identification and mitigation process used by the Project, in consultation with DAHP and ORSHPO, interested and affected tribes, and other consulting parties. Because of its size, the Project has resulted in an increased awareness of applicable research methods, resource potentials, potential precontact and historic resource locations, and potential treatment methods within a complex urban environment. The document, which will be prepared during the analysis and reporting phase of the archaeological mitigation program, shall:

   (i) Discuss appropriate background research and analysis methods that can be applied to fulfill state and federal environmental requirements for future public or private development;

   (ii) Identify appropriate target locations that have higher probabilities to contain significant resources and the types of expected resources;

   (iii) Identify specific subsurface testing methods that can provide preliminary indications of significant resources including a discussion of criteria for identification of probable intact resources warranting further consideration;

   (iv) Describe mitigation data recovery methods appropriate to treatment of properties within urban settings and areas of deep Holocene sedimentation, and procedures for mitigation during construction.

   (v) Discuss lessons learned regarding archaeological methods for discovery, analysis, and recovery of submerged cultural resources.

3. FHWA, FTA, WSDOT, ODOT will contract with interested consulting tribes to participate in the development of the following project plans and products:

   (i) Inadvertent discovery plan

   (ii) Interpretive programs

   (iii) Archaeological Resources Treatment Plan

   (iv) Monitoring Plan

   (v) Guidance Document (see IV.C.2)

   (vi) Addenda to cultural resource reports

(vii) Noise Wall Plan

D. Tribal Monitoring

WSDOT and ODOT will ensure that an appropriate construction monitoring plan is in place during all phases of the construction of the project. The details of the monitoring efforts will be laid out in the Construction Monitoring Plan. The interested and affected tribes shall be afforded opportunity to participate directly in Project archaeological monitoring activities as specified in the Treatment Plan with staff paid for by WSDOT and ODOT.

E. Consultation

1. WSDOT and ODOT shall communicate with consulting parties at the following times, with a 30-day review period for comments:

    a. After completion of the draft Treatment Plan and IDP for review and comment;

    b. Monthly after the date of signing of this Agreement, providing an update on archaeological and mitigation progress;

    c. When design is finalized, if any changes to the impacts described in the Treatment Plan have been identified; and

    d. At the request of a consulting party.

2. WSDOT and ODOT shall facilitate field visits for consulting parties upon request.

3. Each communication with interested and affected tribes shall include an offer to meet individually, or to facilitate a meeting with multiple tribes. DAHP, ORSHPO, FHWA, and FTA shall be invited to all meetings, unless requested otherwise.

4. WSDOT and ODOT shall consult with interested and affected tribes prior to public outreach on the topic of tribal history or other tribal issues.

V. DISPUTE RESOLUTION

A. All signatories and concurring parties shall strive to address and resolve disagreements informally. In the event that resolution cannot be achieved within 30 calendar days, the applicable sections of 36 CFR 800 will determine steps for notice and resolution between FHWA and FTA, and the ACHP.

B. Should a member of the public raise an objection, FHWA and FTA shall take the objection into account and consult as needed with the objecting party to resolve the objection.

C. Each party reserves any and all rights it may otherwise have to enforce its rights or seek resolution of the dispute under applicable law. Nothing in this agreement can be

construed as being a waiver of the sovereign immunity of any Federally recognized Tribe.

D. This MOA or violation of any of its terms does not create any right of action for any party whether a signatory of this MOA or not. Violations of the terms of the MOA shall be addressed as violations of the consultation requirements under 36 CFR Part 800.

VI. AMENDMENT AND TERMINATION

A. Any signatory to this MOA may terminate it by providing 30 calendar days written notice to the other parties, provided that the signatories will meet during the period prior to termination to seek agreement on amendments or other actions that would avoid termination. Consulting parties will be invited to any such meetings. This MOA cannot be terminated without such a meeting.

B. In the event of termination, and prior to work continuing on the undertaking, FHWA and FTA shall either (a) execute an MOA pursuant to 36 CFR 800.6 or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR 800.7. FHWA and FTA will notify the signatories as to the course of action it will pursue.

C. If any signatory proposes to modify this MOA or its attachments in a manner that alters the resolution of adverse effects of historic properties, the modification will be made in consultation with consulting parties. The modified MOA must be signed by all signatories.

D. Unless terminated, this MOA will be in effect until FHWA and FTA, in consultation with all signatory and concurring parties, determines that all of its terms have been satisfactorily fulfilled. For its duration, this MOA will be reviewed by all signatories and concurring parties every five years commencing upon full execution of this MOA by the signatory parties.

VII. DURATION

A. This MOA will take effect immediately upon execution by the Signatory Parties. The terms of this MOA will be satisfactorily fulfilled upon completion of the project. Unless terminated, this MOA will be in effect until FHWA and FTA, in consultation with all signatory and concurring parties, determine that all of its terms have been satisfactorily fulfilled.

B. Execution of this MOA by the Signatories and implementation of its terms evidence that the FHWA and FTA have taken into account the effects of this undertaking on historic properties and afforded the ACHP an opportunity to comment.

C. Upon the execution of this MOA and unless terminated or the terms of the MOA are deemed not to have been satisfactorily fulfilled, the consultation requirements of ODOT, WSDOT, FHWA and FTA under 36 CFR Part 800 are deemed met.

VIII. SIGNATORIES:

Federal Highway Administration

Phillip Ditzler — Date August 25, 2011
Phillip Ditzler
Oregon Division Administrator

Daniel Mathis — Date 08/24/2011
Daniel Mathis
Washington Division Administrator

Federal Transit Administration

for Linda M. Gehrke — Date 23 August 2011
R. F. Krochalis
Regional Administrator

United States Army Corps of Engineers

for Kevin J. Bruce DPM — Date 8 Sep 11
John W. Eisenhauer, P.E.
Colonel, Corps of Engineers
District Commander

Oregon State Historic Preservation Office

Roger Roper — Date 8.25.11
Roger Roper
Deputy State Historic Preservation Officer

Washington State Department of Archaeology and Historic Preservation

_____ Date 9/8/11

Allyson Brooks, Ph.D.
State Historic Preservation Officer

Washington State Department of Transportation

_____ Date 9/1/11

Nancy Boyd
CRC Project Director

Oregon State Department of Transportation

_____ Date 09-01-11

Kris Strickler
CRC Project Deputy Director

INVITED SIGNATORY:

National Park Service

_____ Date 08/29/11

Tracy Fortmann
Superintendent, Fort Vancouver National Historic Site

CONCURRING PARTIES:

Confederated Tribes of the Colville Reservation

_____ Date_____
Michael Finley, Chair

Confederated Tribes of the Grand Ronde Community of Oregon

_____ Date_____
Cheryle Kennedy, Chair

Confederated Tribes of Siletz Indians

_____ Date_____
Delores Pigsley, Chair

Confederated Tribes of the Umatilla Indian Reservation

_____ Date_____
Les Minthorn, Chair

Confederated Tribes of the Warm Springs Reservation

_____ Date_____
Stanley "Buck" Smith, Chair

Confederated Tribes and Bands of the Yakama Nation

_____ Date_____
Harry Smiskin, Chair

Cowlitz Indian Tribe

_____ Date_____
William Iyall, Chair

Nez Perce Tribe

_____ Date_____
Brooklyn Baptiste, Chair

Nisqually Tribe of Indians

_____ Date_____
Cynthia Iyall, Chair

Spokane Tribe

_____ Date_____
Greg Abrahamson, Chair

Chinook Tribe

_____ Date_____
Ray Gardner, Chair

Washington State Department of Natural Resources

_____ Date_____
Bridget Moran
DNR Deputy Supervisor

City of Portland

_____ Date_____
Steve Townsen, P.E.
City Engineer

City of Vancouver

_____ Date_____
Eric Holmes
City Manager

TriMet

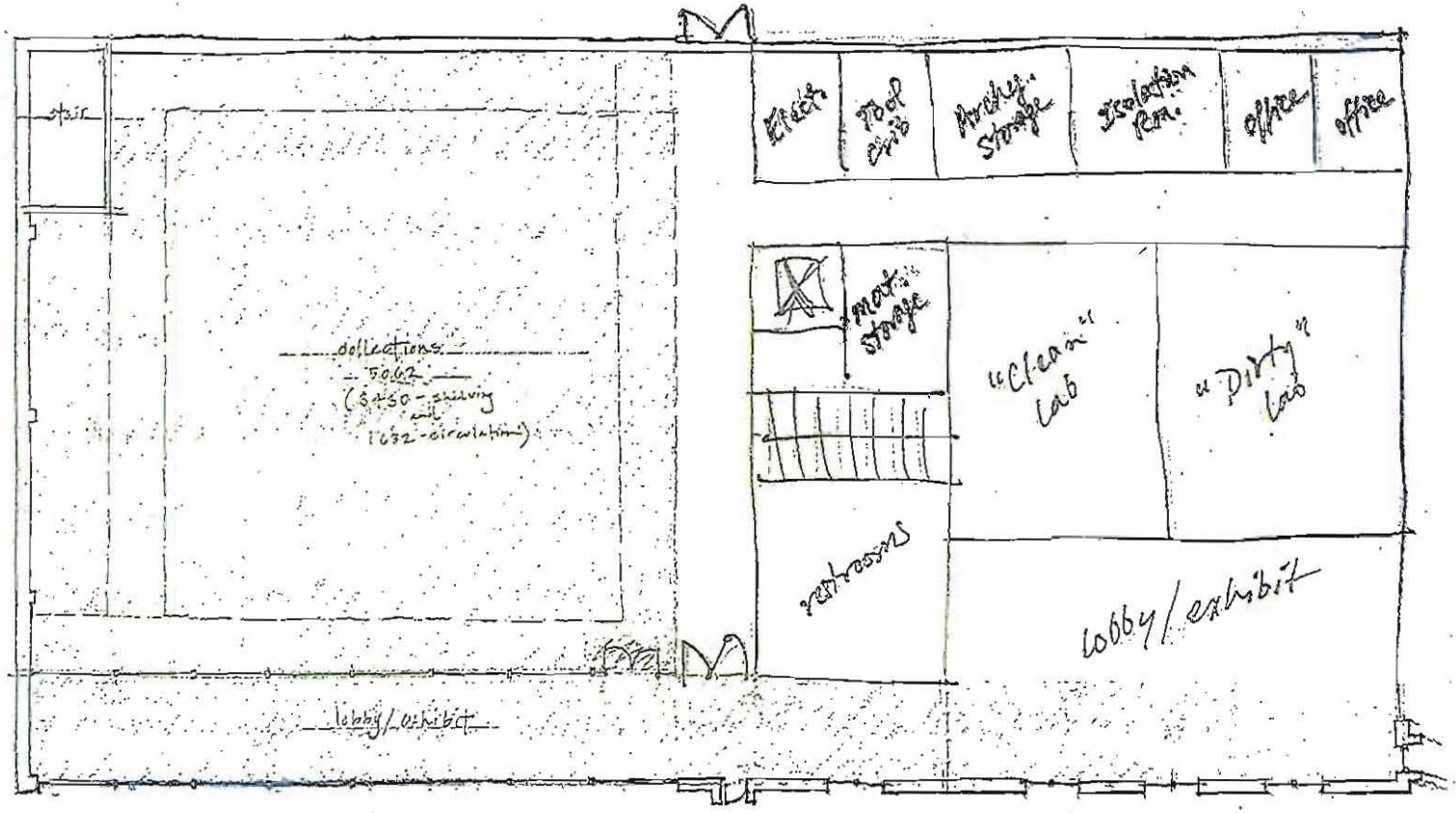
_____ Date_____
Daniel W. Blocher, P.E.
Executive Director Capital Projects

C-TRAN

_____ Date_____
Jeff Hamm
Executive Director/CEO

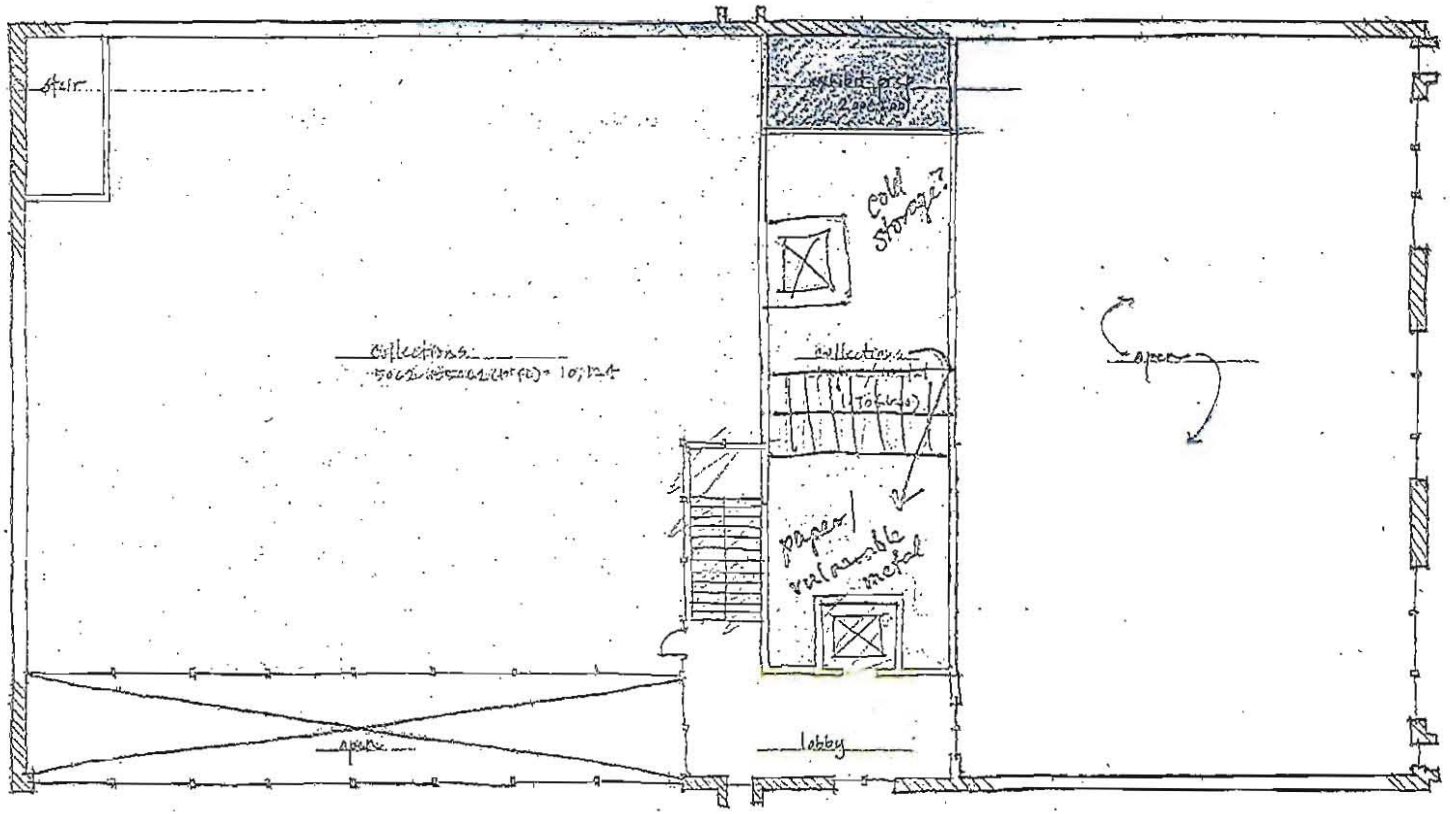
APPENDIX A

NPS Museum/Curation Facility Conceptual Design



NORTHWEST CULTURAL RESOURCES CENTER — 1st FLOOR — SCHEME C

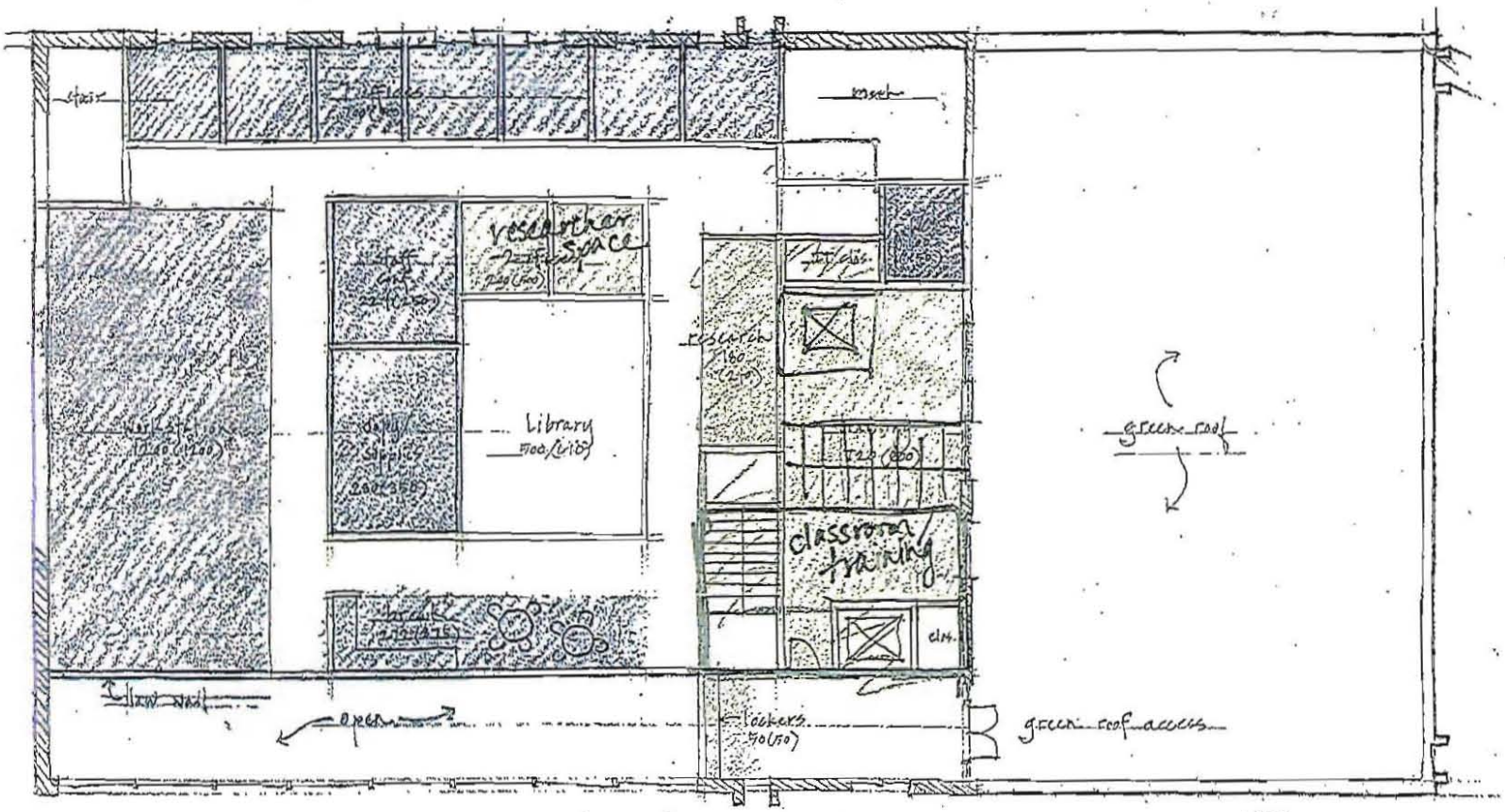
FORT VANCOUVER - BUILDING 605 — 1/8"=1'-0" — OCT 14, 2010



NORTHWEST CULTURAL RESOURCES CENTER — 2ND FLOOR — SCHEME C

FORT VANCOUVER - BUILDING 405 — 1/8" = 1'-0" — OCT. 14, 2010

ARCHITECTURE Group, Inc.



NORTHWEST CULTURAL RESOURCES CENTER — 3rd FLOOR — SCHEME C

PORT VANCOUVER - BUILDING 405 — 1/16"=1'0" — OCT. 14, 2010

Architecture Group Inc.