



Report to the Washington State Legislature

Columbia River I-5 Bridge Planning Inventory

December 2017



**Washington State
Department of Transportation**

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December 1, 2017

Secretary of the Senate
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Dear Members of the Washington State Senate and House of Representatives:

On behalf of the Washington State Department of Transportation (WSDOT), I am pleased to submit the Columbia River I-5 Bridge Planning Inventory Report as directed by the Legislature in SSB 5806. The intent of this report is to provide an understanding of previous planning and development efforts that could be relevant to any future Interstate 5 Bridge replacement project, and to assist in non-duplicative work and effective decision-making as outlined in the legislation.

With the passage of SSB 5806, the Legislature acknowledged that the problems in the Interstate 5 corridor in southwest Washington must be addressed. Delays leading up to the Interstate 5 Bridge during the daily peak commute periods are increasing and corridor travel speeds are dropping, affecting trip reliability for the movement of people and goods between Vancouver, Washington and Portland, Oregon. Additionally, frequent crashes in the corridor and on the bridge itself affect public safety. Replacement of the Interstate 5 Bridge as part of a comprehensive corridor solution is needed to support critical trade routes, provide transportation choices in the face of congestion, and improve safety.

Previous work engaged a broad base of agency, citizen and other stakeholders who collectively developed a shared vision of the problem and initiated the formal federal environmental review process. Over more than a decade, multiple agencies, along with community members and stakeholders, collaborated to produce valuable technical documentation regarding existing and predicted corridor conditions, and acquired several key permits. The six local agency project partners all endorsed the locally preferred alternative. Subsequent to this endorsement, the Federal Highway Administration and the Federal Transit Administration issued a Record of Decision in 2011, formally documenting the successful completion of the environmental review process. The report includes links to documents referenced that are also available on WSDOT's website.

As recognized in SSB 5806 and detailed in the enclosed report, data and decisions from the previous work will be valuable to any future replacement of the Interstate 5 Bridge. Any path forward to replace the spans will require strong partnerships and coordination. Our commitment is to serve as a resource, and support the work of the Legislative Action Committee as they undertake their work outlined in SSB 5806.

Sincerely,



Roger Millar, PE, AICP
Secretary of Transportation

Columbia River I-5 Bridge Planning Inventory Errata

The Columbia River I-5 Bridge Planning Inventory published to WSDOT's website on December 1, 2017 contained the following errata. The items below have been corrected in versions downloaded or printed after January 10, 2018.

Section 4, page 62: Corrects the parties to the tolling agreement between the States—the Washington State Transportation Commission and the Oregon Transportation Commission.

Miscellaneous sections and pages: Minor grammatical corrections.

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This report and additional supporting information is available at the following website:
www.wsdot.wa.gov/accountability/ssb5806/

Executive Summary

As directed by the Washington Legislature in SSB 5806, Section 5, this report provides an inventory of all planning, environmental, permitting and engineering work that was previously performed related to the construction of a new Interstate 5 (I-5) bridge over the Columbia River. The report is structured to provide information to the Washington Legislature, to the public, and to a proposed joint Washington and Oregon Legislative Action Committee in potential efforts (anticipated in SSB 5806) to begin a new project development process for a replacement bridge. The report seeks to provide information that could assist the proposed joint Legislative Action Committee in determining the extent to which prior activities may:

- remain useful as the basis for future actions related to a new bridge; and,
- provide a technical or procedural foundation for new planning and project development activities related to a new bridge.

Major Milestones Completed in Prior Project Planning

Prior project planning included both long-range planning and project development activities for the Columbia River Crossing (CRC) Project. The multi-year project development phase encompassed planning and engineering activities to develop and compare the costs and benefits of alternatives; stakeholder and public participation processes to develop consensus on the project components; identification of impacts to meet both the intent and the legal requirements of the National Environmental Policy Act (NEPA) and other applicable federal laws; and development of a funding and finance plan, including participation in federal grant processes and rigorous analysis of a tolling program.



Prior project planning included development of a bridge design concept that accommodated all modes of travel.

Major milestones completed during this process resulted in:

- The selection of a locally preferred alternative by local partner agencies: City of Vancouver, City of Portland, C-TRAN, TriMet, Southwest Washington Regional Transportation Council and Metro;
- A Record of Decision issued by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), approving the proposed actions, mitigation measures and conditions identified in the Final Environmental Impact Statement (FEIS) for the project;
- A U.S. Coast Guard Bridge Permit which addressed the height and other features of the proposed new bridge;
- An \$850M Federal Transit Administration Capital Investment Grant funding recommendation by the U.S. Department of Transportation, reflected in the federal budget for Fiscal Year 2012;
- Design plans of sufficient detail to support detailed, validated cost estimates;
- Construction procurement, phasing and packaging plans; and,
- A tolling and finance plan that was validated through preparation of an investment grade traffic and toll revenue study and review by the Oregon Treasurer.

Analysis completed for the CRC Project NEPA process will be useful in subsequent environmental review or reevaluation, as the natural and built environment of the project area are substantially the same as they were when the Record of Decision was issued. However, the extent to which a new project could be informed by prior environmental analysis and/or approvals may depend on factors such as:

- the extent to which a new project is responding to the same statement of Purpose and Need;
- the extent of changes in conditions in the project area;
- the extent of changes in the scope and design of a new project.

At a minimum, a new project will require a reevaluation to comply with NEPA, and may require a Supplemental Environmental Impact Statement or more.



Prior project planning included a light rail transit extension of the Portland MAX system to downtown Vancouver and Clark College.

Section 1: Introduction

Legislative Background to this Report

During the 2017 regular session, the Washington Legislature enacted SSB 5806, relating to preliminary work to develop a process for planning for a new I-5 bridge spanning the Columbia River. The Act invites the Oregon Legislature to participate in a joint Legislative Action Committee regarding the construction of a new Interstate 5 bridge spanning the Columbia River and proposes a work program that includes:

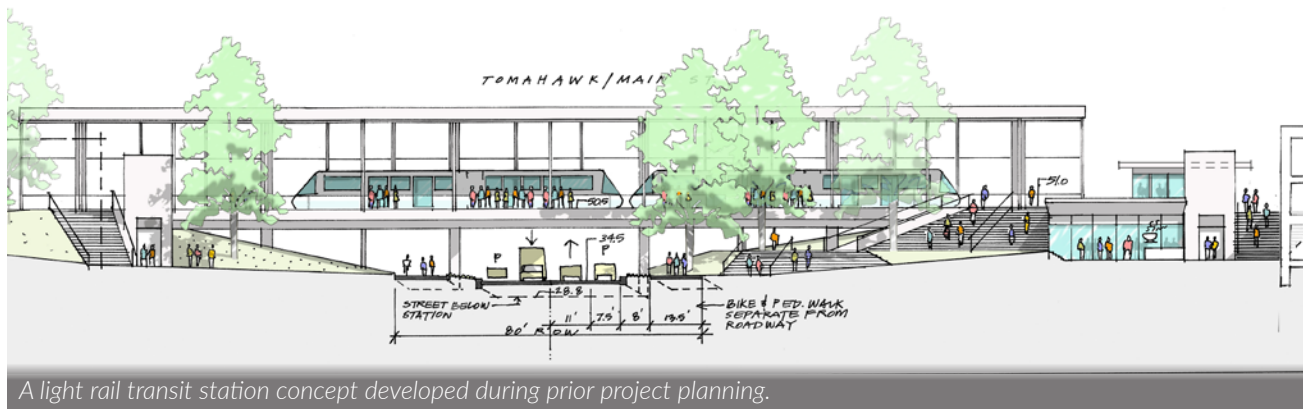
- Beginning a process toward project development;
- Reviewing and confirming lead roles related to permitting, construction, operation and maintenance of a future Interstate 5 bridge project;
- Seeking public comment and presenting recommendations for process and financing;
- Providing resources to inventory and utilize any prior relevant work to allow for non-duplicative and efficient decision making regarding a new project;
- Examining all potential mass transit options available for a future Interstate 5 bridge project;
- Using an innovative delivery method such as design-build procurement and other best practices, consistent with work already completed.

SSB 5806 also directs the Washington State Department of Transportation (WSDOT) to conduct a planning inventory to document the existing planning data related to the construction of a new Interstate 5 bridge over the Columbia River (this report).

Significant Characteristics of the Project Area

During long-range planning, a project area was defined, spanning the five-mile area of Interstate 5 between State Route 500 in Vancouver, and Columbia Boulevard in Portland. Known as the I-5 Bridge Influence Area (BIA), this segment initially included eight interchanges (subsequently refined to include seven interchanges), including connections with four state highways (SR 14, SR 500, and SR 501 in Washington and OR 99E in Oregon), and with several major arterial roadways serving a variety of land uses, and provides access to downtown Vancouver, two international ports, industrial centers, residential neighborhoods, retail centers, and recreational areas. The complexity of uses and access points makes it necessary to analyze the BIA as a whole.

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 economies. At the Columbia River, I-5 provides a critical economic connection to two major ports, deep-water shipping, upriver barging, two transcontinental rail lines, and much of the region's industrial land. Truck-hauled freight movement within the Bridge Influence Area was



A light rail transit station concept developed during prior project planning.

identified during long-range planning as critical to the functioning of these industrial centers, to regional employment and to the regional and national economies. I-5 was identified as the primary transportation link between Vancouver and Portland, and the only direct connection between the downtown areas of these cities.

CRC Project Summary

The Governors of Oregon and Washington appointed a 39-member Columbia River Crossing (CRC) Task Force to provide input to the development of evaluation criteria and the review of alternatives through a phased screening process for the CRC Project, resulting in broad consensus on a locally preferred alternative (LPA) that included the following components:

- A new river crossing over the Columbia River for vehicles and freight, transit, bicyclists and pedestrians and I-5 highway improvements. Included improvements to seven interchanges, north and south of the river, as well as related enhancements to the local street network.
- 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.
- A new toll on motorists using the river crossing as a demand management and financing tool.
- Transportation demand and system management measures to be implemented with the project.

Section 2: Long-Range Planning

Trade and transportation issues in the I-5 corridor through the Portland and Vancouver metropolitan areas have over two-decades of history and study, bi-state leadership and public participation. Precursors to the Columbia River Crossing Project included recommendations of a bi-state leadership committee in 1999, and a strategic plan developed by a task force appointed by the Governors of Washington and Oregon in 2001-2002. Each step in the process involved key interagency and community stakeholders, which allowed for the development of a shared understanding of transportation problems, policy issues and possible solutions.

Bi-State Transportation Committee

In January 1999, regional elected officials and decision makers initiated the *Portland/Vancouver I-5 Trade Corridor Freight Feasibility and Needs Assessment*, to better understand the magnitude of the congestion problem and explore concepts for improvement. Key recommendations from this assessment that were carried forward in project planning included:

- The need for a balanced set of improvements in the corridor, including highway, transit, and demand management.
- Funding for the improvements would likely require a combination of federal funds, tolling, and state funds from Washington and Oregon.

Portland/Vancouver I-5 Transportation and Trade Partnership Task Force

The Governors of Washington and Oregon established a 26-member Task Force in 2001 to address the growing congestion on I-5 in the metropolitan areas of Vancouver and Portland and to determine investment needs through the development of a Strategic Plan. This “Portland/Vancouver I-5 Transportation and Trade Partnership Task Force” (Partnership Task Force) looked at a broad corridor from I-205 to I-84. The Partnership Task Force also identified the Bridge Influence Area as the corridor from SR 500 in Washington to Columbia Boulevard in Oregon; this Bridge Influence Area ultimately became the CRC project area.

The Partnership Task Force recommended fixing highway bottlenecks in its 2002 Strategic Plan:

- I-5 at Salmon Creek in Clark County (completed in 2006)
- I-5 at Delta Park in Portland (completed in 2010)
- I-5 at I-84 and the Rose Quarter in Portland (In 2017, Oregon’s transportation bill, HB 2017, identified funds for evaluation and improvements at this location); and
- I-5 at the Columbia River (the response to this recommendation became the Columbia River Crossing project).



The Partnership Task Force findings and recommendations provided the policy underpinnings for several key elements of the CRC Project including the Purpose and Need statement; the assumption that tolling would be a core element of the finance plan; addressing two-lane sections (by expanding to three lanes) as a key principle for the highway policy and project elements; and the need for both transit and vehicle capacity improvements within the Bridge Influence Area.

The Transition from Long-Range Planning to Project Development

As the project moved from long-range planning into project development and the formal Federal processes of environmental review and grant funding review, prior planning efforts and findings were incorporated. This information helped in identifying and evaluating project needs. Solution ideas evaluated in long-range planning were reconsidered and evaluated in further detail through the CRC Project to ensure compliance with Federal requirements.



Section 3: Context and Constraints

Planning and design of the CRC project were guided by the project vision, values, purpose and need identified through long-range planning processes and refined by broad-based stakeholder groups. As the project team worked to develop solutions to address the project vision, values, purpose and need, those solutions also considered and addressed context and constraints related to:

- characteristics of the built and natural environment within the Bridge Influence Area, including historic resources, river levees, and residential neighborhoods;
- navigation and aviation requirements mandated by the U.S. Coast Guard and Federal Aviation Administration;
- protected species and resources, requiring approval of federal and state resource agencies;
- traffic conditions and travel demand within the Bridge Influence Area, including the need to consider the functionality of the seven closely spaced interchanges as a system in the design of each individual interchange;
- existing traffic bottlenecks, such as at the Rose Quarter in Portland, that were anticipated at the time to continue to impact traffic flow after completion of the project [note: Oregon's 2017 transportation bill identified funds for evaluation and improvements at the Rose Quarter];
- safety deficiencies of existing facilities, including seismic vulnerability of the existing I-5 bridges and traffic, bicycle and pedestrian safety issues;
- freight mobility issues including existing and projected volumes of freight traffic and deficiencies in the design of existing facilities related to truck-hauled freight; and
- transit, bicycle and pedestrian issues, including the strengths and weaknesses of existing and potential modes for serving trips with transit, and deficiencies in the design of existing facilities related to pedestrian and bicycle travel.

Guiding Principles: Vision and Values Statement & Statement of Purpose and Need

During initial project level planning, the statement of Purpose and Need was developed by the Columbia River Crossing Task Force, the state Departments of Transportation, FHWA, FTA, the local Metropolitan Planning Organizations and the local transit agencies. The CRC Task Force also developed a statement of Vision and Values, which helped guide the identification of possible project components and alternatives and the component screening process for the project. The Purpose and Need and Vision and Values were based on previous I-5 corridor planning studies, solicitation of public input through a formal scoping process conducted as part of the NEPA process, and coordination with stakeholder groups and interagency partners.

The Final Environmental Impact Statement for the CRC stated the purpose of the project was “to improve I-5 corridor mobility by addressing present and future travel demand and mobility needs in the CRC Bridge Influence Area ...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).”

These objectives were directed at addressing the six problems identified with stakeholders at the beginning of the environmental process:

- 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.

Built and Natural Environment

During CRC project planning, constraints of the built and natural environment of the Bridge Influence Area were significant to the development and design of project components. Examples include parks and historic resources, airport flight paths, levees, and residential neighborhoods located close to highway interchanges.

Navigation and Aviation

The Columbia River is a navigable waterway, and the project area is close to an international airport, and a general aviation airfield. Taken together, the constraints on bridge height, waterway clearance, and air space restrictions left a relatively narrow envelope of unregulated space that would be feasible for a new bridge. Bridge designers had to “thread the needle” between these constraints, and some bridge types were eliminated from consideration in part because they would not fit within the clearance envelope.



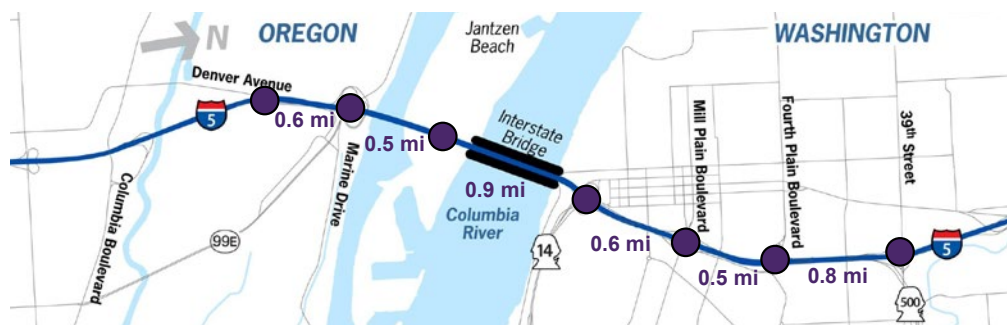
Protected Species and Resources

The project area is home to species and habitats that are protected by the Endangered Species Act, and is characterized by historic and archaeological resources that are protected by the National Historic Preservation Act. The design of a new bridge will require a Section 4(f) Evaluation, a determination by the Federal lead agencies that there is a feasible and prudent alternative to using or impacting publicly own lands, wildlife or waterfowl refuges, or historic sites of significance. The Section 4(f) Evaluation also requires a determination that the selected alternative will have the least harm to these properties, after incorporating mitigation measures.

Traffic Conditions and Travel Demand within the Bridge Influence Area

During CRC project development, data showed that weekday traffic congestion at the I-5 bridge was expected to increase to more than fifteen hours by the year 2030. On-time freight deliveries were, and are today, compromised by congestion, hampering productivity and efficiency. Bus transit between Vancouver and Portland also gets stuck in traffic and is less reliable. The CRC project was designed to improve safety and mobility for expected travel demand increase over a 20-year period and was forecast to reduce weekday congestion to 3.5 to 5.5 hours in 2030.

The interchanges in the BIA are closely spaced; they do not meet the desired 1-mile standard for spacing. Several of these interchanges serve unique destinations such as downtown Vancouver, the ports of Portland and Vancouver, and Hayden Island. Additionally, the project found heavy use of all interchanges and ramps with more than two thirds of bridge users also using one or more interchanges in the BIA. The use characteristics and destinations served by these interchanges made it infeasible to eliminate interchanges to address safety and mobility issues. The close spacing of interchanges made it necessary to consider them as a system – changes to a given interchange impacted the functionality of adjacent interchanges. CRC planning work identified auxiliary lanes and braided ramps to address demand at these interchanges, allowing travelers to safely get on and off the Interstate in the BIA.



Safety of Bridge and Highway Facilities

Safety deficiencies of the existing bridge and highway facilities were a major consideration during prior project planning. Deficiencies of the existing bridge and highway facilities related to seismic safety, highway traffic safety, and pedestrian and bicycle safety are contextual issues that would likely impact the scope and design of a new project.

Freight Mobility

Maintaining freight mobility in the face of increasing highway congestion was a key policy objective throughout prior long-range planning and project development efforts. Freight stakeholders emphasized the importance of access to the ports, reliability of travel time, and ease of navigation (wayfinding) for freight movements. In comparison with similarly sized U.S. metropolitan areas, the Portland region's competitiveness is largely dependent on the region's role as a gateway and distribution center for domestic inland and international markets.

By 2030, the number of large trucks using the Interstate Bridge was expected to increase by 77 percent. More than \$40 billion worth of freight moved across the Interstate Bridge each year, expected to increase to more than \$70 billion by 2030. A 2005 Cost of Congestion report concluded that failure to invest adequately in transportation improvements would result in a potential loss valued at \$844 million annually by 2025 and cost the region 6,500 jobs. The report also found that regional investment in transportation would generate a benefit of at least 2 dollars for every dollar spent.

Mobility for Transit, Pedestrian and Bicycle Travel

Improving transit and non-motorized transportation options (multimodal transportation) was an objective of regional agencies and stakeholders and influenced the identification and selection of project components. At the time of the CRC project, existing transit service across the Columbia River was provided by express buses connecting park and ride facilities in metropolitan Vancouver to major employment centers in Portland, leaving a significant gap in service to meet the forecast demand. The northern end of TriMet's MAX Yellow line was and remains at Expo Center – within the southern boundary of the CRC project area. At the time, the MAX light rail system, including the Yellow Line, had about 52 miles of track providing fixed route service that connected downtown Portland to Gresham, Portland International Airport, Clackamas, Beaverton, Hillsboro and Expo Center.

Highway interchanges, the bridge sidewalks and other outdated facilities within the Bridge Influence Area were identified as an impediment to pedestrian and bicycle mobility during CRC project planning. To meet standards and expectations for the safety and connectivity

of these facilities, pedestrian and bicycle improvements were integrated into the design of the new facilities, typically comprised of connections to existing and proposed on-street facilities and trails. Many of the improvements were integrated into highway and transit components.

Section 4: Funding and Finance

During prior project planning, a broad range of possible funding and finance options were considered and analyzed, and reviewed with project leadership, stakeholders and funding agencies. Prior to closeout, the CRC Project had developed a viable, externally validated funding and finance plan, sufficient to cover capital costs, that included tolling, federal transit funds, and proposed state contributions.

CRC Funding & Finance Plan Evolution

Funding and finance options were developed, reviewed and refined throughout project development. The CRC Project participating agencies endeavored to take a holistic look at the project and to develop an equitable funding strategy through which the States would share cost and funding responsibilities approximately equally. The aspirational targets of this funding strategy assumed that:

- Roughly one-third of the funding would be secured from Federal sources;
- Roughly one-third of the funding would be generated by user fees (tolls);
- For the remaining one third of required funding, the states would make relatively equal funding contributions from state sources.

A “three-legged stool” of federal, state and toll revenue sources was expected throughout CRC Project Development. However, plans were revised as needed to reflect the most current forecasts of the ability to secure funds from each of these sources.

An assumption that the finance plan would include a discretionary federal highway funding appropriation was an element of the plan through the publication of the Final Environmental Impact Statement, but was subsequently eliminated from the plan, as Congress had not moved forward with a major transportation reauthorization bill. To accommodate this reduction in funding, the project explored cost reductions through scope adjustment, and funding enhancements through adjustments to tolling assumptions. The major adjustments were to introduce “pre-completion tolling” into the financial analysis, such that tolling would be implemented prior to completion of construction, and small adjustments to the toll rate assumptions.

Tolling Assumptions, Analysis and Plans

To understand the potential contribution of tolls to capital construction costs, toll revenue forecasting included:

- gross toll revenue forecasts: estimates of total potential toll revenue based on all vehicles paying their toll;
- net revenue forecasts: estimates of the portion of revenues available for repayment of debt, including estimates of the tolls that are expected to be collected, cost of collection (credit card and banking fees), costs for toll collection and facility operation and maintenance for the bridge and roadway, and essential expenditures to ensure the facility can continue to collect tolls; and
- financial capacity of net revenue: identifies the amount of capital funding for construction that can be supported through borrowing backed by the net toll revenue stream.

An investment grade analysis of traffic forecasts and toll revenues was performed and demonstrated that toll revenue would provide sufficient funding, in conjunction with FTA and state contributions, to allow for construction of the project as defined in June of 2013 as a bi-state project as well as in January of 2014 as an Oregon-led project. After reviewing the December 2013 investment grade analysis, net revenue analysis and funding capacity analysis, the Oregon Treasurer concluded that: “if the assumptions underlying the projections made by the consultants are valid, the tolls will be sufficient to service the project bonds.”

As is required for any toll project in the two states, the project had been authorized by the Washington Legislature and by the Oregon Transportation Commission as an eligible toll project. The Washington and Oregon Transportation Commissions had executed a toll rate setting agreement that laid out the basic structure between the states for toll rate setting.

Future Prospects for Federal Funding

The CRC Project pursued the potential for significant Federal funding from both transit and highway sources. CRC was performing competitively in pursuit of transit funds through the FTA New Starts capital investment grant program. FTA issued a funding recommendation of \$850 million for the project in the 2013 Annual Report on Funding Recommendations. FTA rates projects on various attributes including New Starts funds share of total project funding; they seek to spread grant funds as much as possible and give higher ratings for lower New Starts share percentages. Senator Patty Murray authored legislative language directing FTA to consider the New Starts request as a portion of the total multimodal cost instead of just the transit portion of the project. This successful legislation facilitated the project’s request for \$850 million, which represented approximately 90% of the project’s transit-related capital costs, by directing the FTA to evaluate the New Starts request as a 24% share of total CRC project costs.

Highway funds were believed to be a possibility through an earmark or competitive grant given presidential recognition of the project's national significance and sustained support from the Washington and Oregon Congressional delegations. As there was no action on a significant new highway funding bill while the CRC Project funding plan was being developed, it was concluded that the Federal highway investment would not reliably be achieved within the necessary funding window.

National surface transportation authorization bills are unpredictable in their timing. It is unlikely funds for a new bridge project would come through the current bill, the FAST Act. This Act runs through FFY 2020. Federal funding can be sought for projects that are regionally prioritized and sufficiently defined. However, this requires significant coordination, federal delegation support and can be more viable when project readiness is synchronized with national transportation bill timing. In absence of good timing, reliance on Federal funding can introduce uncertainty into the finance plan and project development overall.

Funding and Finance: Background and Findings

The size, complexity and bi-state nature of the CRC project put it in a unique category for financial planning work—significant planning and engineering work was needed to support committing funds; new and unique funding sources were essential; and, funding uncertainty impacted project development and delivery. Over the course of CRC Project development, plans were revised as needed to reflect the most current forecasts of the ability to secure funds from each of these sources. Although the project was progressing effectively on a major Federal transit grant, an assumption that the finance plan would include a discretionary Federal highway funding appropriation was eventually eliminated from the plan, as Congress had not moved forward with a major transportation reauthorization bill.

Some funding and finance findings from the prior project include:

- Traditional capital funding sources and programming approaches that are available to the state DOTs for highway projects are not sufficient for a megaproject given other transportation needs across the states. Funding a megaproject would require the consideration of alternative revenue and financing sources such as tolling, FTA New Starts grants, and Federal loan programs that introduce additional schedule requirements, responsibilities, oversight and complexity.
- Funding and finance plans that involve multiple sources of revenue involve complex schedules for the authorization of funding and financing. A key challenge is to achieve certainty about each major funding source within a reasonable timeframe for project decision making.

-
- Federal agencies that provide funding or loans seek to be the “last money in” to a project. This creates complexities and uncertainty for a megaproject that is seeking funding or financing from multiple sources.
 - Financing toll revenues for capital construction funding requires rigorous analysis to satisfy the credit markets. The analysis has a short shelf life; it must be completed near to the time when borrowing will occur, to engender investor confidence. This investment grade analysis of traffic forecasts and toll revenues was completed and demonstrated that toll revenue would provide sufficient funding, in conjunction with FTA and state sources, to support construction of the project as defined in June of 2013 as a bi-state project as well as in January of 2014 as an Oregon-led project.
 - Funding and finance plans require multiple iterations, because their development is parallel to the development and refinement of alternatives, cost estimates and phasing plans.
 - The bi-state and multimodal nature of a bridge crossing the Columbia River introduces considerations related to the allocation of costs, funding and risk between the States and transit agencies and to project components. Agreement is needed between the two states that define the allocations, and the earlier this agreement is made the easier it is to settle on the funding and finance plan.
 - The timing of project expenditures and revenue streams are not likely to be perfectly matched, which introduces financing (borrowing) requirements.



Section 5: Project Management, Leadership and Coordination

Introduction: Management, Leadership and Coordination of Complex Projects

Prior long-range planning and project development each featured extensive participation across all levels of government and by varied interest groups and stakeholders. The State DOTs, as the organizations formally authorized to manage interstate highway facilities and state routes on the National Highway System through coordination with the Federal Highway Administration, served as the primary project owner with responsibility for managing project development. The CRC Project team included the local transit agencies, metropolitan planning organizations, and cities, supported by engineering and environmental consultants. The CRC Project team used a variety of coordination and external validation processes to ensure participation and gain support and/or approvals required to advance the project.

Project Management and Leadership Roles

Throughout the long-range planning and project development processes, Oregon and Washington worked effectively together through the leadership of state and local elected officials and the cooperation of agencies including the state Departments of Transportation (ODOT and WSDOT), regional planning agencies (Metro and SWRTC), transit agencies (TriMet and CTRAN) and municipal governments (Cities of Vancouver and Portland). Private sector and community stakeholders also participated extensively in these processes.

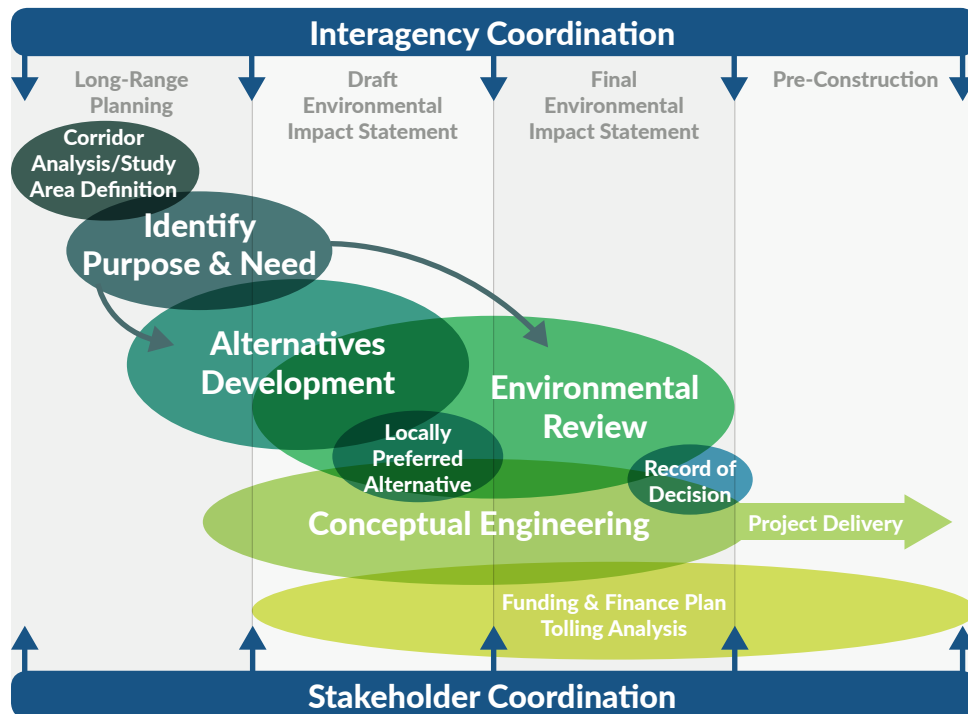
Coordination Structure and Roles

During prior project planning, numerous interagency and advisory groups and coordination processes provided input and guidance to inform project development and decision making, including:

- Interstate Collaborative Environmental Process (InterCEP)
- Columbia River Crossing Task Force
- Project Sponsors Council
- CRC Working Groups
- Tolling Study Committee

Section 6: Project Development

The CRC’s multi-year project development phase encompassed planning and engineering activities to develop and compare the costs and benefits of alternatives; stakeholder and public participation processes to develop consensus on the project components; identification of impacts to meet both the intent and the legal requirements of the National Environmental Policy Act (NEPA) and other applicable Federal laws; and development of a funding and finance plan, including participation in federal grant processes and rigorous analysis of a tolling program. These project development activities, characteristic of any major project undertaking, are time and resource intensive.



Major Project Development Process

Framing the Problem and Establishing Evaluation Criteria

Prior project planning framed the problems to be addressed and the criteria to be used in evaluating possible solutions, first in the long-range planning processes described in Section 2, and then through the development of a Vision and Values statement and a statement of Purpose and Need for the CRC Project. Throughout the alternatives development process, the Vision and Values and Purpose and Need formed the basis of criteria that were used to evaluate options, guide decisions about which options should

proceed for further analysis, and inform the selection and refinement of alternatives. Evaluation activities were conducted by project staff, agency stakeholders and with guidance and feedback from the public to determine which ideas were most likely and best suited to address the problems identified.

CRC Project Components and Screening

Candidate project components were developed, analyzed, reviewed with stakeholders, and narrowed based on the results of the analysis and stakeholder feedback. A broad range of possible components was screened against criteria derived from a Vision and Values statement and a statement of Purpose and Need developed in consultation with stakeholders. The components included:

- 23 river crossing component options, ranging from various locations and heights for a replacement bridge, supplemental bridge options, a tunnel option, and new corridor options;
- 14 transit component options, including a range of bus, rail and ferry modes;
- 6 pedestrian component options;
- 6 bicycle component options;
- 5 freight component options; and
- 18 Transportation Demand Management (TDM)/Transportation System Management(TSM) component options.

Alternatives Package Development and Screening

The early screening efforts identified several promising options for further study. The best-performing river crossing options at that time were a replacement bridge, and a supplemental arterial or Interstate bridge. Express Bus, Bus Rapid Transit (BRT), and Light Rail Transit (LRT) were the best performing transit modes. These components were packaged into twelve representative alternative packages. The packages were structured to assess performance as a package, and to identify how individual features would perform in different combinations. Each alternative package included a river crossing type and transit mode(s), as well as specific designs to improve safety, freight movement, highway operations, and bicycle and pedestrian access.

Selection of the Alternatives to be Included in the Draft Environmental Impact Statement (DEIS)

The screening process culminated in the selection of five alternatives to be analyzed in the DEIS for the project. The alternatives allowed for comparison of a replacement bridge and a supplemental bridge, as well as comparison of two possible transit modes. The alternatives were:

1. The No Build Alternative
2. Replacement Bridge with Bus Rapid Transit (BRT)
3. Replacement Bridge with Light Rail Transit (LRT) extending the existing Portland MAX light rail system to downtown Vancouver and Clark College
4. Supplemental Bridge with BRT
5. Supplemental Bridge with LRT

Selection of the Locally Preferred Alternative

The *CRC Task Force adopted* the Locally Preferred Alternative (LPA), which was also endorsed WSDOT and ODOT and the six local project partners (C-TRAN, TriMet, Southwest Washington Regional Transportation Council, Metro, City of Vancouver and City of Portland).

The LPA featured:

- The new river crossing over the Columbia River and the 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.
- Extension of light rail from the Expo Center in Portland to Clark College in Vancouver, and associated transit improvements, including transit stations, park and rides, bus route changes, and expansion of a light rail transit maintenance facility.
- Bicycle and pedestrian improvements throughout the project corridor.
- A toll on motorists using the river crossing.
- Transportation demand and system management measures to be implemented with the project.

Analysis and Selection of the Transit Component

The analysis of transit mode demonstrated that LRT would attract and accommodate more riders, because it would connect potential transit riders in Vancouver to a broader range of destinations via the extensive existing light rail network in Portland. The analysis also showed that LRT was a more capital-intensive (higher cost) alternative than BRT, while BRT was a more operating-intensive (higher cost) alternative than LRT, requiring more vehicle trips and higher operations and maintenance costs to serve the demand for transit service (because each BRT vehicle accommodates fewer riders than a light rail train).

Refinements to the Locally Preferred Alternative

Refinements of components continued after adoption of the LPA to reduce project costs, address impacts and improve performance. These refinements were addressed in the Final EIS or in subsequent NEPA Reevaluation documents. In June 2009, the Project Sponsors Council requested that the CRC Project refine the project designs for the LPA to identify cost savings while maintaining the environmental, economic, traffic and safety benefits identified in the LPA. The project team recommended several refinement options which cumulatively offered a \$650 million cost reduction.

In February 2010, the governors of Oregon and Washington directed project staff to continue design work using the recommended refinements to reduce the project cost. As a result of the cost-saving analysis and decisions on bridge design, estimates of the most likely cost of construction were reduced to \$3.2 billion, within a range of \$2.6 to \$3.6 billion. Previous estimates had been within a range of \$3.1 - \$4.2 billion.

Integrated Environmental Review

Preparation of required environmental documents requires extensive, multidisciplinary research and analysis. The environmental review completed during prior project planning summarized existing conditions, impacts, and potential mitigation measures.

In December 2011, the FHWA and FTA jointly issued a Record of Decision (ROD) finding that the requirements of the National Environmental Policy Act (NEPA) had been satisfied for the construction and operation of the Selected Alternative of the CRC Project. (“Selected Alternative” is the term used in the ROD to describe the Locally Preferred Alternative, with any refinements incorporated at the time of the ROD.) The ROD also provided findings on other environmentally-related federal statutory requirements. The ROD described the highway and transit features that were to be included in the project, identified mitigation commitments, and incorporated the NMFS Biological Opinion and the National Parks Service Section 106 Memorandum of Agreement. FHWA and FTA signature on this document finalized the environmental review process and formally identified the federal agencies’ selected alternative for the CRC—a replacement Interstate 5 bridge with light rail—and allowed final design and construction planning to proceed.

Analysis completed for the CRC FEIS will be useful in subsequent environmental review or reevaluation, as the natural and built environment of the project area are substantially the same as they were when the Record of Decision was issued. However, the extent to which

a new project could be informed by prior environmental analysis and/or approvals may depend on factors such as:

- the extent to which a new project is responding to the same statement of Purpose and Need;
- the extent of changes in conditions in the project area;
- the extent of changes in the scope and design of a new project.



Conceptual Design and Preliminary Engineering

The CRC Project Team conducted conceptual design and preliminary engineering efforts throughout the project timeline to support component identification, alternative development, NEPA, cost estimates and risk assessments, public outreach, environmental permitting, and procurement development. At each phase of the project development process, selected elements of the project were advanced further in their design than may be typical for smaller projects, because the significance of the investment decision required substantial detail to inform decision-making and to provide appropriate levels of certainty about costs, benefits and impacts. Although a new project may introduce new options to be developed, engineering completed previously as part of the CRC Project would likely have value to a new project. There is detailed information available on the cost and performance of the alternatives and on a variety of technical issues that may be applicable to a new bridge project. Among the CRC technical work that could be useful:

- Drilled shaft tests that confirmed the feasibility of 10-foot diameter shafts drilled to a depth of over 200 feet; this finding greatly reduced project construction risks and allowed for a significant narrowing of the cost estimate range;
- The feasibility of mitigating the environmental impacts of in-water work with “bubble curtain” techniques that limit the impacts of construction vibration on protected species. Validating this method expanded the allowable work window for this schedule-critical work element and further reduced project construction risks;
- The viability of combining highway and transit into a single bridge, reducing project scope and construction cost;

- Identification of a bridge envelope, including height, size and location of the bridge, that satisfied the requirements of the U.S. Coast Guard, U.S. Army Corps of Engineers, and Federal Aviation Administration to maintain navigation pathways, bridge clearances, and clearances of aviation;
- Collection and documentation of extensive geotechnical information on land and in water which allowed completion of a baseline report and foundation design reports for bridges; and,
- Identification and evaluation of historic resources and archaeological data, including underground investigation.

Additionally, a host of agency and community stakeholder issues were addressed through concept design and preliminary engineering during prior project planning.

Public Involvement

A hallmark of the CRC Project was extensive coordination amongst stakeholders and engagement with the public to develop the vision and goals for the I-5 trade and transportation corridor, the project features that would best address the problems identified by the stakeholders, and myriad design and engineering details of the selected project alternative. The project alternative selected as locally preferred was preferred in citizen comments received. Through March 2013, the CRC Project participated in 1,277 public events, leading to 33,984 face-to-face contacts to allow people to learn about the project and provide input. Public involvement continued beyond the environmental phase as the design and finance plan was refined and project delivery options were developed.

Extensive outreach was conducted to a broad set of community audiences. The public involvement program supported the dissemination of project information in printed copy and electronic form through the CRC Project website; attendance at fairs, festivals and community events; literature drops at community centers; presentations to neighborhood, service and business groups; and presentations to community and neighborhood groups. The project's mailing list, used to encourage participation in public events and involve the broader community, grew to nearly 6,000 email addresses and more than 14,000 postal mailing addresses. Diverse outreach techniques were used to reach low-income and minority populations through organizations that represented their interests, at locations in their communities.

The project engaged stakeholders and solicited comments and recommendations through topic- and geography-specific advisory groups; public open houses, design workshops and issue-specific public meetings; and ongoing opportunities to meet with staff at the project office, by phone, email and online comment and question submittal. The CRC Project provided regular briefings to elected officials, boards, and civic leaders throughout the region.

Community input shaped project development, outreach and design. Through the public involvement program, more than 12,000 public comments were received on a range of topics. These comments were reviewed and reported on by CRC project staff to leadership and advisory groups and aided project staff and leadership in developing the project and making decisions to reflect the public interest

FTA Capital Investment Grant “New Starts” Process

The CRC project participated in the FTA Capital Investment Grant (New Starts) program from 2006 through 2013. Instead of an annual call for applications and selection of awardees, projects seeking New Starts funding complete a series of steps over several years to be eligible for funding. The FTA works closely with project proponents throughout the Project Development and Engineering phases; for this reason, the New Starts process is fully integrated into project development, rather than a stand-alone funding and finance activity.

The FTA recommended \$850 million in funding for the CRC project in the FY 2013 President’s Budget and the FY 2013 Annual Report on Funding Recommendations. To the extent that a renewed project includes a similar transit component, a new project could pursue New Starts grant funding, and much of the engineering and analysis completed previously would be useful in preparation of a new funding request. The timeframe for a renewed New Starts grant process would take several years and would depend on when a new project was initiated, the features of a new project, including the development of a funding plan that would demonstrate sufficient local financial commitment, and progress on any steps required to modify the design, cost estimate and environmental review of the project.

Real Estate Acquisition Management Planning

As required by the FTA as part of the New Starts process, the CRC Project developed a Real Estate Acquisition Management Plan (RAMP). The RAMP included implementation strategies, an acquisition schedule, a cost estimate for acquisitions, and processes for acquisition and relocation.



External Review and Validation

Prior project planning benefited from external review and validation of key elements of project development, through the Cost Risk Assessment/Cost Estimate Validation Process, a Value Engineering Study, a Travel Demand Modeling Review Panel; a Greenhouse Gas Expert Review Panel, an Independent Review Panel, a Bridge Review Panel, and an Oregon Treasurer CRC Finance Review.

Section 7: Project Delivery

Introduction

SSB 5806 suggests consideration of delivery methods, including design-build procurement and others that enhance or improve delivery and outcomes. CRC project planning included analysis and recommendations regarding project delivery. Project delivery methods refer to the overall process by which a project is designed, constructed, and/or operated and maintained. CRC project planning considered procurement methods, and the phasing, sequencing and packaging of project elements. The analysis and findings were summarized in the CRC Project Delivery and Procurement Plan Final Report (PDPP) (September 2012). The recommendations of the Bridge Review Panel, the Cost Estimate Validation Process (CEVP), Project Sequencing workshops, Project Packaging and Delivery Method workshops, a Constructability Review, the FEIS, and a Transit Value Engineering Workshop were all inputs into the PDPP analysis and recommendations.



The CRC Drilled Shaft Test Program helped to inform project risks and delivery options.

Project Delivery Methods

Funding options can help determine the delivery methods for projects within a program. Section 7 provides descriptions for the methods listed here. Public funding allows more traditional delivery methods such as:

- Design-Bid-Build (DBB);
- Design-Build (DB);
- General Contractor/Construction Manager (GC/CM);
- Design-Furnish-Install (DFI); and
- Design-Build-Operate-Maintain (DBOM).

Private funding (such as public-private partnerships) enable additional delivery method options. Private funding comes in the form of private financing which can carry unique contractual obligations. Consideration of public-private partnerships as a funding source for the CRC project is discussed in Section 4. These additional delivery method options include:

- Design-Build-Finance (DBF);
- Design-Build-Finance-Maintain (DBFM);
- Design-Build-Finance-Operate-Maintain (DBFOM); and
- Build-Own-Operate.

Project Procurement Methods

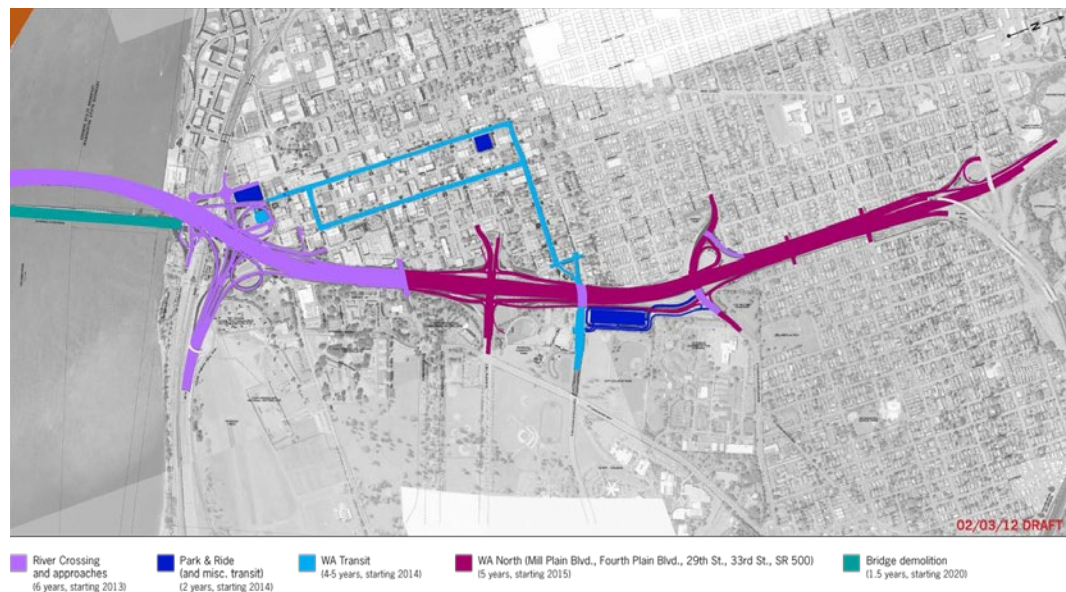
Once a delivery method is chosen for a project, a procurement method must be chosen. Project procurement (contracting) methods refer to the procedures used to evaluate and select designers and contractors. The range of procurement methods includes those that are determined solely by price, solely on qualifications, as well as those based on a combination of clearly defined factors such as price, time, and technical qualifications. Procurements can be done in a single step or as a multi-step process.

Program Phasing, Sequencing and Packaging

The project delivery recommendations of the prior work were informed by program phasing, program sequencing, and construction packaging.

Key factors informing the program's framework for project packaging include:

- A sequencing strategy;
- Interdependencies of project components;
- Jurisdictional changes and urban features along the alignment;
- Schedule criticality;
- Financial cash flow projection;
- Inherent risks;
- The level and complexity of oversight required for multiple interfaces among packages;
- Lead times;
- Specialty work; and,
- Optimizing opportunities for competition and for participation by disadvantaged business enterprises (DBEs).



Section 8: Operations and Maintenance

During prior project planning, the DOTs developed comprehensive Operations & Maintenance (O&M) cost estimates for the proposed new infrastructure assets, including:

- Annual highway facility costs;
- Annual, fixed toll collection costs;
- Variable toll collection costs (per transaction);
- Bridge insurance; and
- Annual transit O&M costs.

Additionally, the parties developed shared assumptions about ownership and operation of the bridge and transit facilities.

Highway Operations and Maintenance Costs

Responsibility for conducting operations and maintenance of a new bridge would have been addressed in an agreement between the states in similar fashion to the existing agreement between the states regarding the Interstate Bridge.

The highway O&M cost of the new bridge was anticipated to consist of annual routine O&M costs and periodic rehabilitation and replacement costs. Routine highway O&M costs were anticipated to consist of facility costs (i.e., the annual costs of operating and maintaining the roadway and bridges) and toll collection costs (i.e., the annual costs of collecting tolls and maintaining toll equipment).

The cost estimates included a robust facility maintenance program, bridge insurance program, incident response program, and rehabilitation and replacement program to avoid loss of toll revenue and support the investment grade analysis thereby reducing the cost of borrowing against toll revenue by providing additional security for bond investors.

Transit Operations and Maintenance Costs

Operations and maintenance costs were developed for the operation of the proposed Light Rail Transit Extension and for increased feeder bus service to the light rail stations in Vancouver. The bi-state governance of transit operations and maintenance was expected to be addressed through an agreement between C-TRAN and TriMet. An agreement was executed by C-TRAN and TriMet in September 2013. The agreement left existing governance structures in place; established specific roles, responsibilities, and authorities for both parties; and required approval of significant O&M issues by both transit districts. The agreement included a decision-making process between the two transit districts regarding critical light rail operating policies such as headways, span of service, and anticipated annual O&M cost as part of the annual budget approvals required of both districts.

Section 1:

Introduction

Legislative Background to this Report

During the 2017 Regular Session, the Washington Legislature enacted Substitute Senate Bill 5806, relating to preliminary work to develop a process for planning for a new Interstate 5 bridge spanning the Columbia River. The Act acknowledges population growth and peak hour vehicle and truck delays on the Interstate 5 corridor through Vancouver, and identifies the need for infrastructure investments to support critical trade routes, alleviate congestion, and improve safety. The Act also invites the Oregon Legislature to participate in a joint Legislative Action Committee regarding the construction of a new Interstate 5 bridge spanning the Columbia River and proposes a work program that includes:

- Beginning a process toward project development;
- Reviewing and confirming lead roles related to permitting, construction, operation and maintenance of a future Interstate 5 bridge project;
- Seeking public comment and presenting recommendations for process and financing;
- Providing resources to inventory and utilize any prior relevant work to allow for non-duplicative and efficient decision making regarding a new project;
- Examining all potential mass transit options available for a future Interstate 5 bridge project;
- Using an innovative delivery method such as design-build procurement and other best practices, consistent with work already completed.



Prior project planning included development of a bridge design concept that accommodated all modes of travel.

The Act also directs the Washington State Department of Transportation (WSDOT) to conduct a planning inventory to document the existing planning data related to the construction of a new Interstate 5 bridge over the Columbia River (this report). The act establishes timelines of December 1, 2017 for the submittal of the WSDOT report to the Legislature, and December 15, 2018 for the Joint Legislative Action Committee's findings and recommendations, which the Act anticipates will be transmitted to both the Washington and Oregon legislatures.

Purpose and Structure of this Report

As directed by the Washington Legislature, this report provides an inventory of all planning, environmental, permitting and design work that was previously performed related to the construction of a new Interstate 5 bridge over the Columbia River. The report is structured to provide information to the Legislature, to the public, and to the joint Washington and Oregon legislative action committee in potential efforts (anticipated in SSB 5806) to begin a new project development process for a replacement bridge. Information developed during long-range planning and project development activities between 1999 and 2014 is organized in this report into categories emphasizing the context, constraints and policy issues; funding and finance issues; and implementation elements of these activities. The report provides information that could assist the proposed Joint Legislative Action committee in determining the extent to which prior activities may:

- remain useful as the basis for future actions related to a new bridge; and,
- provide a technical or procedural foundation for new planning and project development activities related to a new bridge.

Terms Used in this Report

In addition to technical terms that are defined within the report, the following terms are used to simplify references to prior activities and roles:

Long-range planning: This term is used to refer to planning, analysis, and recommended actions related to the I-5 corridor in the Portland/Vancouver metropolitan area that preceded project development;

Project development: This term is used to refer broadly to project activities including planning, environmental review processes, stakeholder engagement and outreach, engineering and cost estimating, development of funding and finance plans, and identification of construction delivery methods, phasing and contract packaging that precede final design and construction of a project;

CRC Project: The report also uses the term "CRC Project" and "CRC" to refer to prior project activities;

Renewed project: The report uses the term "renewed project" to refer to the possibility of new project development activities that may build on and "utilize any prior relevant work to allow for non-duplicative and efficient decision making regarding a new project" as described in SSB 5806;

New bridge project, new project: The report uses the terms "new bridge project" and "new project" to refer to the "construction of a new Interstate 5 bridge spanning the Columbia River" as described in SSB 5806; and

State DOTs, the DOTs: The Oregon Department of Transportation (ODOT) and the Washington State Department of Transportation (WSDOT) collaborated in prior planning; for brevity, they are referred to as "the State DOTs" or "the DOTs" in this report.

The report will also provide information on sequencing and duration of previous work which may inform expected durations for project development activities related to a new bridge.

The report includes chronological elements of prior planning, but organizes this information primarily by the following topics:

- Long-range planning
- Context and constraints
- Funding and finance
- Project management, leadership and coordination
- Project development
- Project delivery
- Operations and maintenance.

Links to key documents from the prior work that are referenced within this document are provided for those reading a digital version of this report. Additionally, **Appendix A** provides a list of key documents, together with information on how to access the documents on-line.

Significant Characteristics of the Project Area

During long-range planning, a project area was defined, spanning the five-mile area of Interstate 5 between State Route 500 in Vancouver, and Columbia Boulevard in Portland. Known as the I-5 Bridge Influence Area (BIA), this segment initially included eight interchanges (subsequently refined to include seven interchanges), including connections with four state highways (SR 14, SR 500, and SR 501 in Washington and OR 99E in Oregon), and with several major arterial roadways serving a variety of land uses, and provides access to downtown Vancouver, two international ports, industrial centers, residential neighborhoods, retail centers, and recreational areas. The complexity of uses and access points made it necessary to analyze improvements in context of the BIA segment as a whole.

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 economies. At the Columbia River, I-5 provides a critical economic connection to two major ports, deep-water shipping, upriver barging, two transcontinental rail lines, and much of the region's industrial land. Truck-hauled freight movement within the Bridge Influence Area was identified during long-range planning as critical to the functioning of these industrial centers, to regional employment and to the regional and national economies. Interstate 5 was identified as the primary transportation link between Vancouver and Portland, and the only direct connection between the downtown areas of these cities. Long-range planning

studies noted that this major route serves regional and interstate freight and also serves the residents of Vancouver and Portland who drive, ride buses, bike, and walk across the I-5 bridges for work, recreation, shopping, and entertainment.

Prior Work Summary

Washington and Oregon have been working cooperatively toward a project that would include a new I-5 Bridge over the Columbia River for nearly two decades. Prior planning included the findings of broad-based regional stakeholder and interagency groups including a freight corridor study developed by a Bi-State Transportation Committee; a Strategic Plan developed by the Portland/Vancouver I-5 Trade and Transportation Task Force; and the Columbia River Crossing (CRC) Project. The CRC Project was a multi-year effort that included:

- broad stakeholder participation and public involvement in the development of project goals;
- coordination amongst Federal, state and local agencies and American Indian Tribes;
- development and review of a broad range of alternatives to address project goals;
- a detailed environmental review;
- engineering to support the development of project element, to estimate project costs and to address major project risks;
- a project delivery plan for construction; and
- the development of a funding and finance plan.

The Governors of Oregon and Washington formed a 39-member Columbia River Crossing Task Force that established a Vision and Values Statement to articulate project goals. This CRC Task Force also guided the development of a formal statement of Purpose and Need as part of the Environmental Impact Statement process conducted to meet the requirements of the National Environmental Policy Act (NEPA). The Purpose and Need framed evaluation and development of the CRC Project.

The Purpose and Need published in the DEIS and the FEIS identified six specific needs to be addressed by the project, including 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. Section 3 provides additional detail on the statement of Purpose and Need.

The CRC Task Force provided input to the development of evaluation criteria and the review of alternatives through a phased screening process for the CRC Project, resulting in broad consensus on a locally preferred alternative (LPA) that included the following components:

- A new river crossing over the Columbia River for vehicles and freight, transit, bicyclists and pedestrians and I-5 highway improvements. Included improvements to seven interchanges, north and south of the river, as well as related enhancements to the local street network.
- 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.
- A new toll on motorists using the river crossing as a demand management and financing tool.
- Transportation demand and system management measures to be implemented with the project.

The CRC Project progressed through the project development process, resulting in Federal actions including a Record of Decision endorsed by FHWA and FTA approving the proposed actions, mitigation measures and conditions identified in the Final Environmental Impact Statement; a U.S. Coast Guard Bridge Permit; and a Federal Transit Administration Capital Investment Grant funding recommendation; design plans sufficient to support detailed, validated cost estimates; construction procurement, phasing and packaging plans; and a tolling and finance plan that was validated through preparation of an investment grade traffic and revenue study and a review by the Oregon Treasurer.



Section 2:

Long-Range Planning

Introduction

Trade and transportation issues in the I-5 corridor through the Portland and Vancouver metropolitan areas have over two decades of history and study, bi-state leadership and public participation. Precursors to the Columbia River Crossing Project included recommendations of a bi-state leadership committee in 2000, and a strategic plan developed by a task force appointed by the Governors of Washington and Oregon in 2001-2002. Each step in the process involved key interagency and community stakeholders, which allowed for the development of a shared understanding of transportation problems, policy issues and possible solutions.

Bi-State Transportation Committee

In 1999, Portland Metro and the Southwest Washington Regional Transportation Council executed a joint resolution establishing a Bi-State Transportation Committee. This Committee, which still exists today, was charged with reviewing all issues of bi-state significance for transportation in the two metropolitan planning areas. The membership of the committee included representation in Washington from the Washington Department of Transportation, C-TRAN, the City of Vancouver, Clark County and the Port of Vancouver; and in Oregon, from the Oregon Department of Transportation, TriMet, the City of Portland, Metro and the Port of Portland. The committee considered the problem of growing congestion on the highway and rail systems in the I-5 Trade Corridor. As documented in the [2000 I-5 Trade Corridor Freight Feasibility and Needs Assessment](#), the committee made these recommendations:

- The Portland/Vancouver region should initiate a public process to develop a plan for the I-5 Trade Corridor.
- Doing nothing is unacceptable. Increased congestions will significantly affect the regional economy by limiting the region's ability to attract and retain business. Although there are planned transportation improvements in the corridor, they are insufficient to address the problem.
- The solution must be multi-modal—highway, transit and rail improvements and better management of traffic demand. Increasing highway capacity alone will not solve the problem,
- Funding for the scale of improvements that are needed far exceeds the state and federal funds that are available. Given the current structure of public funding, tolling will be required to pay for a new Columbia River crossing and other improvements. Tolls are not new to the area, having been used previously to fund the construction of the I-5 bridges in 1917 and 1958.
- The region must consider measures that promote transportation efficient development such as a better balance of housing and jobs on both sides of the river.

Portland/Vancouver I-5 Transportation and Trade Partnership Task Force

The Governors of Washington and Oregon established a 26-member Task Force in 2001 to address the growing congestion on I-5 in the metropolitan areas of Vancouver and Portland and to determine investment needs through the development of a Strategic Plan. This “Portland/Vancouver I-5 Transportation and Trade Partnership Task Force” (Partnership Task Force) looked at a broad corridor from I-205 to I-84 and made recommendations on projects that should be built and projects that warranted further study. The Partnership Task Force also identified the Bridge Influence Area as the corridor from SR 500 in Washington to Columbia Boulevard in Oregon; this Bridge Influence Area ultimately became the CRC project area.

The Partnership Task Force developed a *strategic plan* that served as a precursor to the Columbia River Crossing Project and to the CRC environmental process. Their findings and recommendations provided the policy underpinnings for several key elements of the CRC including the Purpose and Need statement; the assumption that tolling would be a core element of the finance plan; addressing two-lane sections (expanding to three lanes) as a key principle for the highway policy and project elements; and the need for both transit and vehicle capacity improvements within the Bridge Influence Area.

The Partnership Task Force included participation by Metro, TriMet, C-Tran, the cities of Portland and Vancouver, Multnomah and Clark counties, the Port of Portland, Clark College, neighborhood associations, environmental and social justice advocates, and the private sector. It involved the public in the development of the Strategic Plan through a stakeholder committee referred to as a Community Forum that provided input at each milestone in the planning process, as well as broad-based public outreach using the full range of outreach tools. Nearly 1,700 people participated in the development of the strategic plan through these outreach efforts.

The Partnership Task Force developed a Problem, Vision and Values Statement that helped guide the strategic plan. This statement also served as an important precursor to the formal Purpose and Need statement developed for the NEPA process:

The I-5 Trade Corridor is the most critical segment of the regional transportation system in the Portland/Vancouver metropolitan area. The corridor provides access to many of the region’s most important industrial sites and port facilities and is a link to jobs throughout the Portland/Vancouver region. Due to infrastructure

deficiencies, lack of multi-modal options, land-use patterns, and increasing congestion, businesses and individuals experience more frequent and longer delays in the corridor. Without attention, the corridor's problems are likely to increase significantly, creating additional impacts to mobility, accessibility, livability and economic promise of the entire region.

The Partnership Task Force recommended:

A multi-faceted, integrated plan of transportation policies, capital expenditures, personal and business actions, and incentives to address the future needs of the I-5 Trade Corridor... [to] improve quality of life by:

- Providing travel mobility, safety, reliability, accessibility and choice of transportation modes for users whether public, private or commercial, and recognizing the varied requirements of local, intra-corridor and interstate movement
- Supporting a sound regional economy by addressing the need to move freight efficiently, reliably and safely through the corridor
- Supporting a healthy and vibrant land use mix of residential, commercial, industrial, recreational cultural and historical areas
- Respecting and protecting natural resources including air quality, wildlife habitat and water resources
- Supporting balanced achievement of community, neighborhood, and regional goals for growth management, livability, the environment, and a healthy economy with promise for all
- Distributing fairly the associated benefits and impacts for the region and the neighborhoods adjacent to or affected by the corridor

The Partnership Task Force looked at a broad corridor from I-205 to I-84 and made recommendations on projects that should be built and projects that warranted further study. At that time there were three remaining two-lane sections on I-5 in the study area: 1) I-84-Fremont Bridge in the vicinity of the Rose Quarter, 2) Delta Park to Lombard, and 3) 99th St. to I-205 in Clark County. Work was underway to address the second (completed in 2010) and third sections (completed in 2008). Regarding the Rose Quarter, the Partnership Task Force found that:

Widening I-5 to 3-lanes in the vicinity of the Rose Quarter is likely to have implications for the entire freeway loop around downtown Portland. Changes to this or any other part of the freeway loop should consider the implications on the entire loop. There are significant challenges at the junction of I-5 and I-84 near the Rose

Quarter. These include safety and operational problems due to closely spaced interchanges and the land use objectives for the Rose Quarter area and Lloyd Center district.

The Task Force concluded that:

The transportation issues south of the I-5/Fremont Bridge junction must be addressed and solved. The Mayor of Portland, the Governor of the State of Oregon, and JPACT should join together to appoint a group of public and private sector stakeholders to study and make recommendations for long-term transportation solutions for the entire I-5/I-405 freeway loop.

In 2017, the Oregon Legislature passed HB2017 that provided funds for evaluation and improvements at the Rose Quarter.

The Task Force considered in their planning effort whether I-5 should be three or four lanes in each direction between Portland and Vancouver. The Task Force recommended I-5 between the Fremont Bridge in Oregon and the I-205 interchange in Washington be a maximum of three through lanes in each direction.

The Task Force evaluated current and projected conditions in the BIA and identified a wide range of possible improvements, which were grouped into option packages for screening-level analysis. Recommendations for the BIA included:

Construct new transit and vehicle capacity:

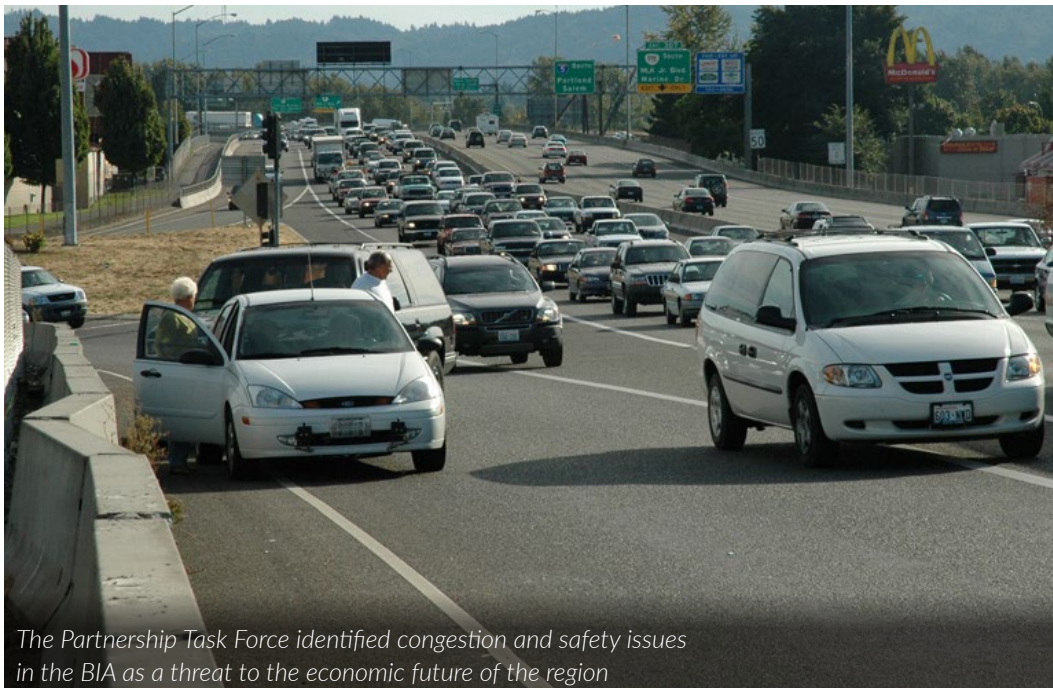
- Three through-lanes and up to two auxiliary or arterial lanes in each direction across the river
- Add Light Rail Transit service across the river in I-5 Trade Corridor
- Redesign the freeway to balance on and off movements
- Include safety considerations
- Undertake an Environmental Impact Statement (EIS).

The Partnership Task Force also studied several options that they did not recommend for further study in an EIS, as they were not considered promising as solutions to the BIA problems:

- a west arterial road;
- a collector-distributor bridge concept; arterial only concepts; tunnel concepts; and commuter rail;
- land use actions or Transportation Demand Management (TDM) without capacity improvements;
- a new freeway and bridge west of I-5 or east of I-205;
- various transit modes: monorail, PRT, hovercraft bus, people mover, water taxi, ferry, helicopter, gondola; and
- a six-lane freeway plus a two two-lane arterial crossing.

The Partnership Task Force made other recommendations for the I-5 Transportation and Trade Corridor beyond those recommended for study in an EIS including:

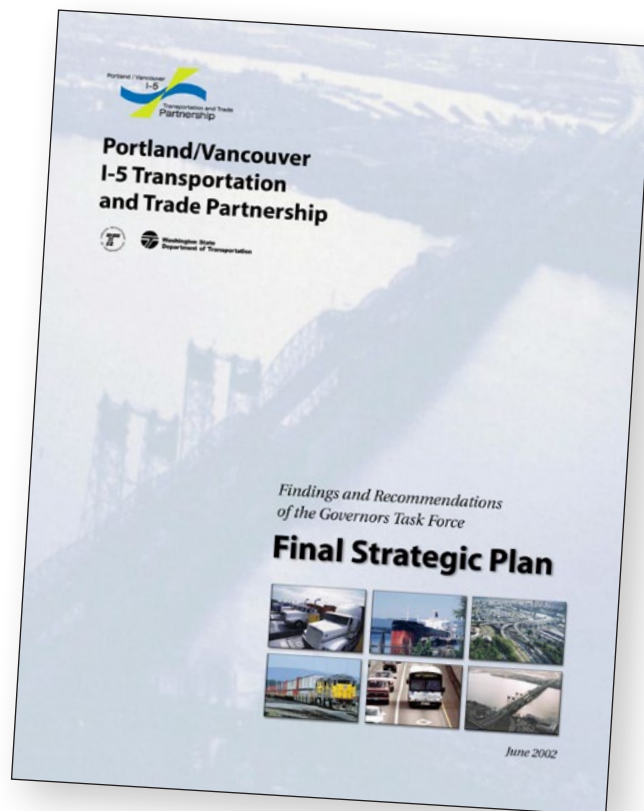
- further explore High-Occupancy Vehicle (HOV) lanes;
- freight rail improvements;
- encouraging funding of intercity passenger rail and High-Speed Rail service;
- adopting TDM/Transportation System Management (TSM) targets for corridor and region.



The Partnership Task Force identified congestion and safety issues in the BIA as a threat to the economic future of the region

The Transition from Long-Range Planning to Project Development

Upon initiation of the Columbia River Crossing project in 2004, the project partners considered the possibility of moving directly into an environmental process that would use the recommendations of the Strategic Plan as the preferred alternative. Given that almost three years had passed since the publication of the Strategic Plan, and that there had been some notable changes in both agency and stakeholder leadership, the project partners (see **Section 5: Project Management, Leadership and Coordination**) made the decision to begin the CRC Project without a preferred alternative. This approach provided the opportunity to further involve the public, local agencies and resource agencies; review and supplement the analysis of transportation problems and solutions; reconsider options that the Partnership Task Force had not advanced and develop new options; and solidify the foundation for the screening of alternatives (see **Section 3: Context and Constraints** and **Section 6: Project Development**). However, long-range planning work informed CRC Project efforts and was an important component of the NEPA process. These broad based efforts helped ensure CRC Project efforts addressed a broad range of alternatives.



Cover of Strategic Plan

Section 3:

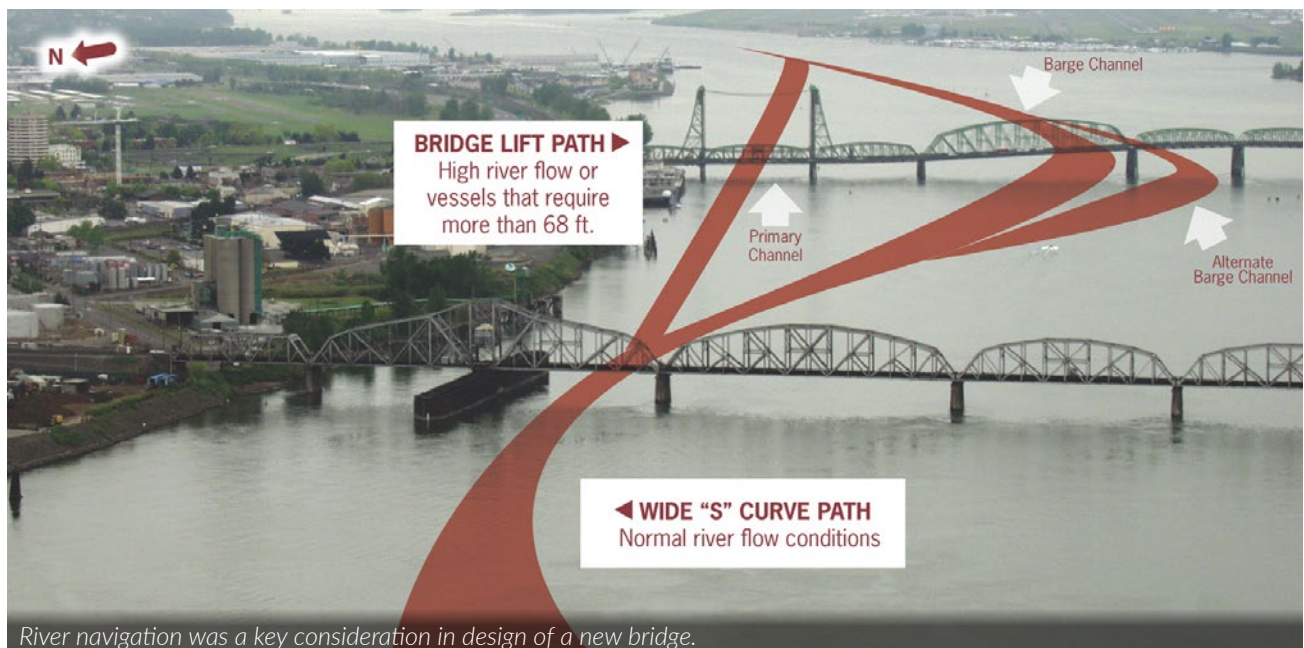
Context and Constraints

Introduction

SSB 5806 seeks efficient decision making regarding a new project and seeks to benefit from any prior relevant work. This section identifies significant context and constraints that may be pertinent to the goals of efficient decision making and use of prior relevant work, through review of the ways in which they influenced prior project planning.

Planning and design of the CRC project were guided by the project vision, values, and the purpose and need identified and refined by broad-based stakeholder groups. As the project team worked to develop solutions to address the identified problems, those solutions needed to consider:

- traffic conditions and travel demand within the Bridge Influence Area;
- characteristics of the built and natural environment within the Bridge Influence Area;
- navigation and aviation;
- protected species and resources;
- safety deficiencies of existing facilities;
- freight mobility issues including existing and projected volumes of freight traffic and deficiencies in the design of existing facilities related to truck-hauled freight; and
- transit, bicycle and pedestrian issues, including the strengths and weaknesses of existing and potential modes for serving trips with transit, and deficiencies in the design of existing facilities related to pedestrian and bicycle travel.



Detail on the ways in which the prior project addressed these issues and constraints is provided in **Section 6: Project Development**.

Section 4: Funding and Finance addresses the challenges associated with funding a megaproject, which was another constraint that influenced project development. The size, complexity and bi-state nature of this kind of project puts it in a unique category for finance work—significant planning and engineering work is needed to support committing funds; new and unique funding sources are essential; and funding uncertainty can impact project development and delivery.

Guiding Principles: Vision and Values Statement & Statement of Purpose and Need

During initial CRC project planning, the CRC Task Force developed a *Vision and Values* statement that provided the foundation for developing criteria and performance measures that were used to evaluate alternatives. The Vision provided the expectation for project development to occur through an inclusive and collaborative process that considered long-range planning work and deliver a financially feasible solution for a healthy community. Values were identified in the following areas: community livability; mobility, reliability, accessibility, congestion reduction and efficiency; modal choice; safety; regional economy; freight mobility; stewardship of natural and human resources; distribution of impacts and benefits; cost effectiveness and financial resources; and bi-state cooperation.

The CRC Project *Purpose and Need Statement* was developed using input from long-range planning, the Task Force, project stakeholders and the public. Project screening and analysis of solutions were measured against the Purpose and Need.

What is a Purpose and Need Statement and Why is it Important?

The statement of Purpose and Need is a required element of environmental review conducted pursuant to the National Environmental Policy Act (NEPA) (42.U.S.C. 4321 et seq.). Purpose and Need is a key criterion by which the federal lead agencies evaluate the adequacy of the analysis, decision making and mitigation measures proposed by the state and local project sponsors. It is also common for public entities to develop statements of project purpose, needs, goals, and/or vision statements during planning phases that may precede the environmental process. The Statement of Purpose and Need can be effective in communicating the policy objectives of the project proponent as part of the planning process, and the Purpose and Need serves as the fundamental criteria for the screening of project alternatives.

The statement of Purpose and Need identified six problems that the CRC Project was intended to address:

- 1. Growing travel demand and congestion:** Existing travel demand was found to exceed capacity in the I-5 Columbia River crossing and associated interchanges. The corridor was experiencing 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 occurred. Due to excess travel demand and congestion in the I-5 bridge corridor, some travelers were diverting to 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 was increasing local congestion. In 2005, the two crossings carried 280,000 vehicle trips across the Columbia River daily. Daily traffic demand over the I-5 crossing was projected to increase by more than 35 percent by 2025, with stop-and-go conditions increasing to approximately 15 hours daily if no improvements were made.
- 2. 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 most of the area's freight consolidation facilities and distribution terminals. Freight volumes moved by truck to-and-from the area were projected to more than double by 2030. Vehicle-hours of delay on truck routes in the Portland-Vancouver area were projected to increase by more than 90 percent by 2025. Growing demand and congestion was expected to result in increasing delay, costs and uncertainty for all businesses that rely on the corridor for freight movement.
- 3. Limited public transportation operation, connectivity, and reliability:** Due to limited public transportation options, a number of transportation markets were 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. Congestion in the corridor was adversely impacting public transportation service reliability and travel speed. Southbound bus travel times across the bridge were 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 was expected to increase substantially by 2030.

- 4. Safety and vulnerability to incidents:** The I-5 river crossing and its approach sections were found to be experiencing crash rates more than two times higher than statewide averages for comparable facilities. Incident evaluations attributed 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 were observed to cause severe delay or more serious accidents.
- 5. 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, impacting safety for pedestrians and bicyclists. Direct pedestrian and bicycle connectivity were found to be poor in the Bridge Influence Area.
- 6. 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.

None of the problems identified in the Purpose and Need have been addressed since the CRC Project ended. A Purpose and Need statement would be essential to a new bridge project.

Built and Natural Environment

During prior project planning, constraints of the built and natural environment of the Bridge Influence Area were significant in the development and design of project components.

The SR 14 interchange constraints include the Vancouver National Historic Preserve (VNHR); a pedestrian connection (sometimes referred to as the land bridge) within VNHR; a historically significant and protected apple tree; flight paths to Pearson Field and Portland International Airport; and BNSF railroad right-of-way. The Marine Drive Interchange included constraints such as a levee and the existing MAX Light Rail Transit (LRT) station at the Exposition Center. The project would be required to address any impacts to these facilities.

Other interchanges featured constraints such as the VNHR structures and a community center near Mill Plain Boulevard; a Veterans Administration hospital and a cemetery near Fourth Plain Boulevard/SR 500; the only community grocery and I-5 as the only way on and off Hayden Island; and residential neighborhoods close to several interchanges.



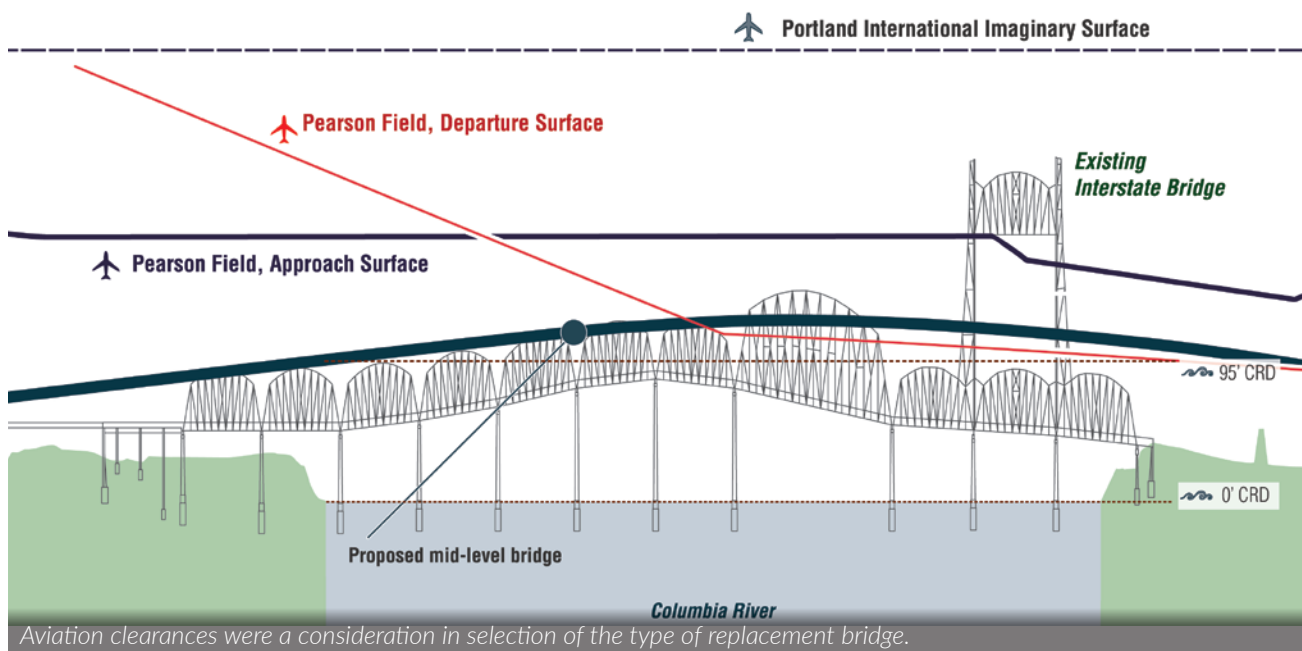
Navigation and Aviation

The Columbia River is a navigable waterway, and the project area is close to an international, and a regional airport. A new bridge, as was the case with CRC, will be required to meet requirements of the U.S. Coast Guard (USCG) and U.S. Army Corps of Engineers (USACE) for providing clearance for vessels and a navigable channel. The USCG requirements were a significant consideration for bridge height during prior project planning, as vessels using the river have priority over highway users. Bridge lifts are defined in Federal code (33 CFR 117.869):

The draws of the Interstate 5 Bridges, mile 106.5, between Portland, OR, and Vancouver, WA, shall open on signal except that the draws need not be opened for the passage of vessels from 6:30 a.m. to 9 a.m. and from 2:30 p.m. to 6 p.m. Monday through Friday except federal holidays.

Notwithstanding this language, Federal law prioritizes users of the waterway over highway users, for safety reasons, and therefore bridge openings are a possibility even with the peak periods identified in the code citation.

The requirements of the Federal Aviation Administration (FAA) for clearance from flight paths also influence bridge height and bridge type. Taken together, the constraints on bridge height, waterway clearance, and air space restrictions left a relatively narrow envelope of unregulated space that would be feasible for a new bridge.



Protected Species and Resources

The Columbia River is home to species and habitat that are protected by the Endangered Species Act. The CRC project area included historic and archaeological resources that are protected by the National Historic Preservation Act as well as federal public land protected by Section 4(f). Pursuant to NEPA, effects to these resources should be avoided, minimized or mitigated.

Traffic Conditions and Travel Demand

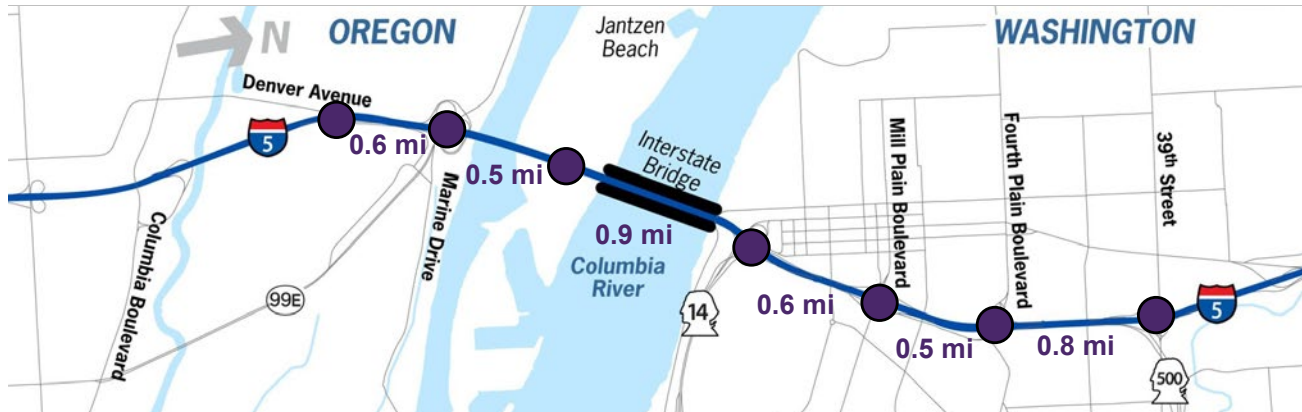
I-5 is the only continuous, north-south interstate highway on the West Coast connecting Mexico, Canada, and points between. On I-5, the Columbia River Crossing between Portland and Vancouver provides connections to two major ports, deep-water shipping, up-river barging, two transcontinental rail lines, 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. The I-5 crossing is a primary transportation link between Vancouver and Portland, and the only direct connection between the downtown areas of these cities. Residents of Vancouver and Portland drive, ride buses, bike, and walk across the I-5 bridges for work, recreation, shopping, and entertainment.

In long-range planning and CRC project efforts, there was a consensus that a long-term closure of the I-5 corridor to accommodate construction of new facilities would not be acceptable because of the impacts this would have on mobility and the economy in the Portland/Vancouver metropolitan areas. Traffic during construction was a consideration in identifying the size and location of new crossing facilities, and to the design of interchange improvements. The new bridge alignment of the Locally Preferred Alternative (downstream of the existing bridges) had a constructability advantage over other possible alignments (such as upstream of the existing bridges; the LPA alignment was anticipated to have a shorter construction duration, resulting in less impact to the traveling public during construction. As feasible, design of other corridor improvements also considered and incorporated opportunities to minimize traffic impacts during construction.

The CRC project was designed to improve safety and mobility in the BIA for known and expected travel demand increases over a 20-year period.

As shown on the map on the next page, the interchanges in the BIA are closely spaced; they do not meet the desirable 1-mile standard for spacing. Several of these interchanges serve unique destinations such as downtown Vancouver, the ports of Portland and Vancouver, and Hayden Island. Additionally, the project found heavy use of all interchanges and ramps with more than two thirds of bridge users also using one or

Section 3: Context and Constraints



Closely spaced interchanges in the bridge influence area do not meet the desirable 1-mile standard for spacing and fall short of the optimal 2-mile spacing.

more interchanges in the BIA. The use characteristics and destinations served by these interchanges made it infeasible to eliminate interchanges to address safety and mobility issues. The close spacing of interchanges made it necessary to consider them as a system—changes to a given interchange impacted the functionality of adjacent interchanges. CRC planning work identified auxiliary lanes and braided ramps to address demand at these interchanges, allowing travelers to safely get on and off the Interstate in the BIA.

During CRC project development, data showed that traffic congestion at the I-5 bridge extended through six hours of the day. The two-bridge crossing, which served 30,000 vehicles per day in the 1960s, carried more than 135,000 automobiles, buses, and trucks each weekday by the early 2000s. On-time freight deliveries were compromised by congestion, hampering productivity and efficiency. Bus transit between Vancouver and Portland also got stuck in traffic and was less reliable.

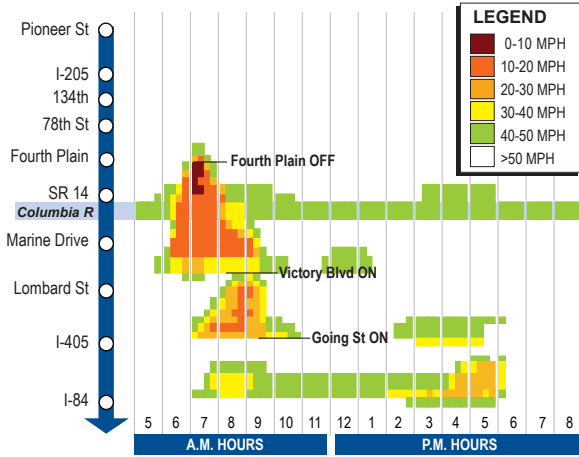
The top figures on the next page show the distribution of southbound and northbound congestion and delay under 2005 conditions. In the morning, congestion and queuing occurred at the southbound I-5 bridge, Delta Park, the I-405 split and the Rose Quarter/I-84. In 2010, the Delta Park section of the highway was widened to three lanes eliminating the bottleneck. In Oregon’s 2017 legislative session, HB 2017 identified funds for evaluation and improvements at the Rose Quarter.

Northbound I-5 also experienced multiple hours of congestion. During the morning, congestion and vehicle queuing occurred between I-84 and I-405. In 2005 conditions, afternoon/evening congestion and vehicular queuing occurred in the Rose Quarter, at I-405, and at the bridge. The bridge bottleneck was more restrictive and resulted in a longer period of congestion than the Rose Quarter/I-405 bottlenecks.

By 2030 if CRC was not constructed, congestion was expected to increase to more than fifteen hours a day: 7.25 hours southbound and 7.75 hours northbound.

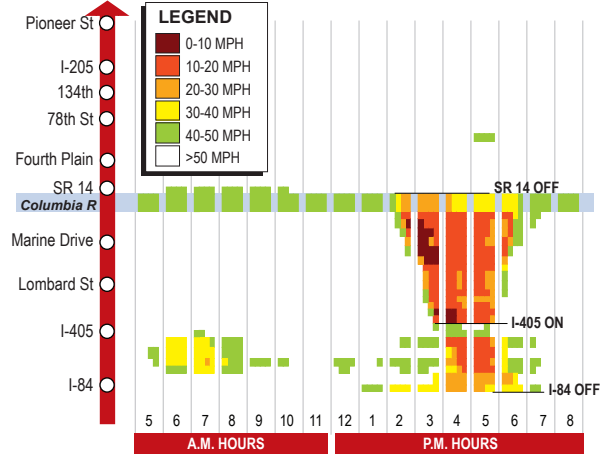
CRC traffic modeling demonstrated that the project would provide significant highway congestion relief, in addition to providing increased mobility through transit investments.

Speed Profiles: 5 a.m. to 9 p.m.
Existing 2005 Conditions, Southbound

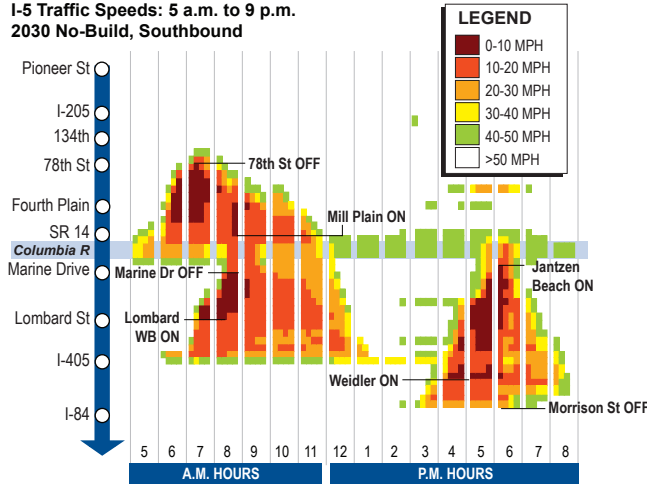


Source: CRC Traffic Technical Report 2008.

Speed Profiles: 5 a.m. to 9 p.m.
Existing 2005 Conditions, Northbound

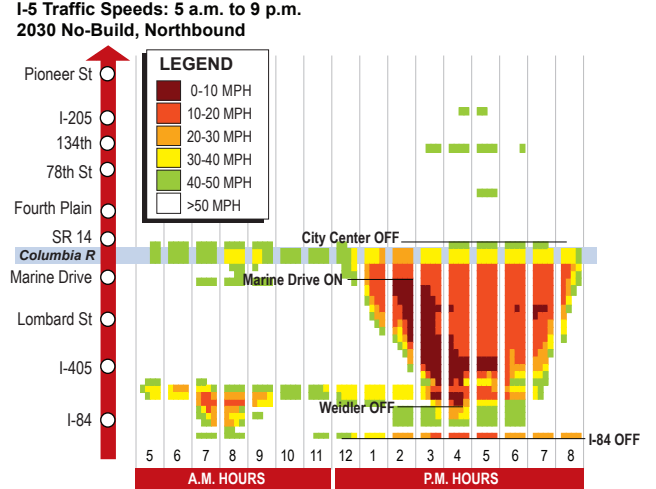


I-5 Traffic Speeds: 5 a.m. to 9 p.m.
2030 No-Build, Southbound



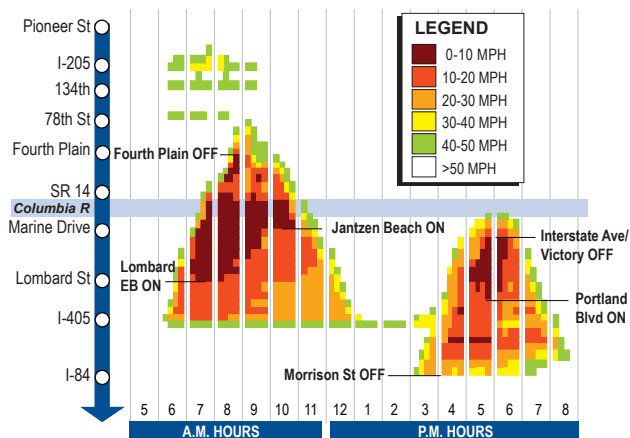
Source: CRC Traffic Technical Report 2008.

I-5 Traffic Speeds: 5 a.m. to 9 p.m.
2030 No-Build, Northbound



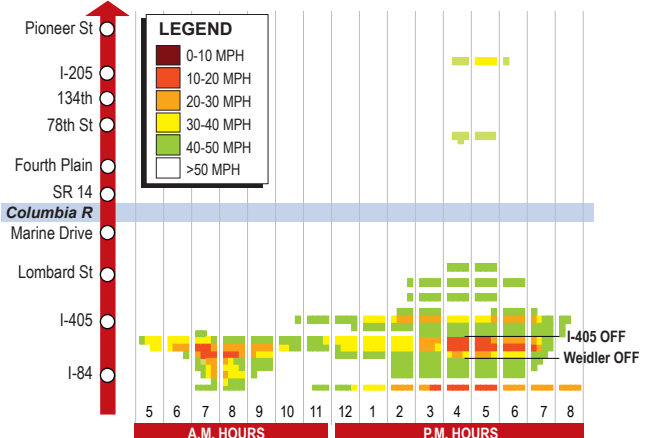
Source: CRC Traffic Technical Report 2008.

Speed Profiles: 5 a.m. to 9 p.m.
2030 Replacement Bridge Alternatives 2 and 3, Southbound



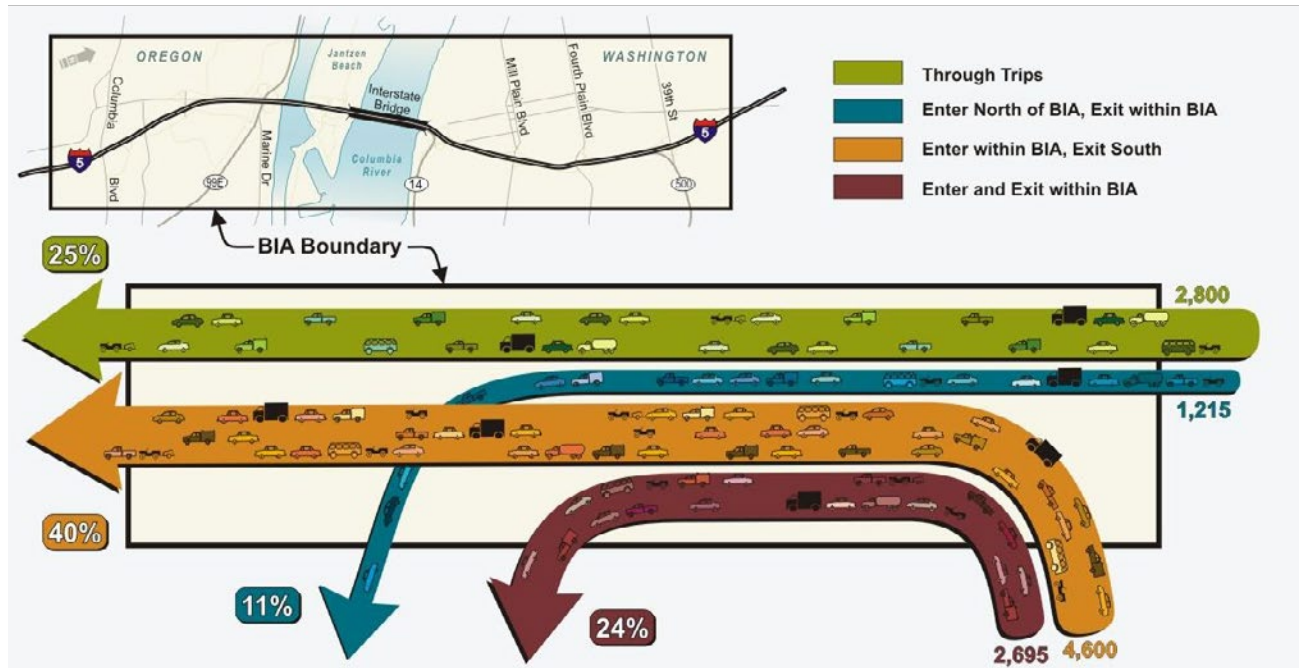
Source: CRC Traffic Technical Report 2008.

Speed Profiles: 5 a.m. to 9 p.m.
2030 Replacement Bridge Alternatives 2 and 3, Northbound



Source: CRC Traffic Technical Report 2008.

Section 3: Context and Constraints



Southbound peak period travel characteristics (2005)

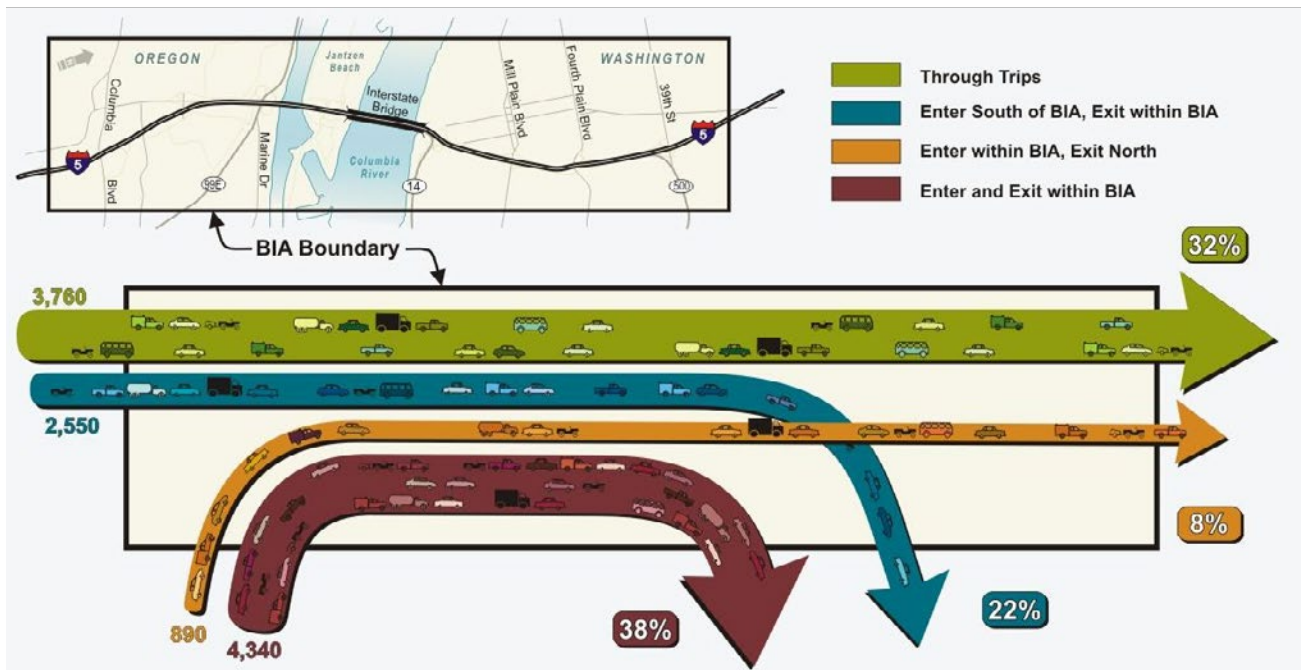
The LPA was forecast to reduce congestion to 3.5 to 5.5 hours a day: 3.5 hours southbound and 0-2 hours northbound.

Peak period commuters would benefit through reduced congestion and travel time and increased reliability for these daily trips. CRC study of travel patterns found that peak travelers across the bridge have an average trip length of 20 miles but that most were on I-5 for a short portion of their trip. Over two-thirds of peak period trips enter and/or exit I-5 at an interchange in the project area.

For northbound PM peak travelers, the project would have benefitted commuters from North Portland and Washington. Travel time reliability southbound during the AM peak would also have improved. Many commuters are traveling to employment destinations along I-5 including downtown Vancouver, the Port of Vancouver, Marine Drive/Port of Portland, the Columbia Corridor and Swan Island.

While existing bottlenecks at I-405 and Rose Quarter were expected to remain, travel time savings were forecast for southbound AM peak trips. In 2017, Oregon’s transportation bill (HB 2017) identified funds for evaluation and improvements at the Rose Quarter. A renewed project could face constraints for some southbound travelers however, removing the bridge bottleneck would still be likely to improve these trips.

Additionally, due to highway improvements and the elimination of bridge lifts, the CRC project would have improved freight mobility and travel time reliability for off-peak travelers.



Northbound peak period travel characteristics (2005)

Safety of Bridge and Highway Facilities

Safety deficiencies of the existing bridge and highway facilities were a major consideration during prior project planning. The states have responsibility for the safety of the traveling public using the bridge and highway facilities in the corridor. Additionally, the public perception of the safety of travel in the corridor is an influence on economic vitality and development potential in the corridor. During prior project planning, safety issues in the corridor were summarized as follows:

Safety is getting worse and collisions occur about once a day. This crash rate is two times higher than similar highways in Oregon and Washington. Crashes will continue to grow with more congestion. Many collisions can be attributed to short on- and off-ramps, inadequate spaces for merging and weaving, and poor sight distances on and near the I-5 bridge. On the Interstate Bridge itself, lane widths are narrower than freeway design standards and there are no safety shoulders which means that incidents on the bridge block travel lanes. In addition to the safety, congestion and mobility issues described above, the bridge is not equipped to handle seismic activity. A significant earthquake could cause bending, buckling or collapse of the I-5 bridge itself or lead to soil liquefaction under the bridge.

Soil liquefaction is one of the most serious potential consequences of an earthquake, as it has the potential to undermine bridge foundations and lead to collapse of the structure. Seismic design criteria were significant considerations in design of the proposed new bridge during prior project planning, to address the seismic risks that had been identified.

The CRC project applied criteria to the design of a new bridge over the Columbia River intended to ensure that the structure would not collapse in the event of a major subduction zone earthquake and that the new bridge would remain operable in the event of a significant earthquake.

Additionally, the CRC FEIS found that:

The existing pedestrian and bicycle facilities throughout the Bridge Influence Area are outdated, potentially unsafe, and confusing to navigate. The width of the shared-use pedestrian and bicycle facility on the I-5 bridge is non-standard (generally no wider than 4 feet) and separated from traffic by the bridge girders and non-standard low barriers. The mixing of pedestrians and bicycles in this narrow facility can cause safety problems. Steep grades on the bridge create high downhill speeds for bicycles and difficult uphill climbs for some. In addition, pedestrians and bicyclists are exposed to high noise levels, exhaust, and debris. Nevertheless, the existing facilities are used by both pedestrians and bicyclists.

Deficiencies of the existing bridge and highway facilities related to seismic safety, highway traffic safety, and pedestrian and bicycle safety are contextual issues that would likely impact the scope and design of a new bridge project.



Freight Mobility

Maintaining freight mobility in the face of increasing highway congestion was a key objective. In comparison with other U.S. metropolitan areas of similar size, the Portland region's competitiveness is largely dependent on the region's role as a gateway and distribution center for domestic inland and international markets. Freight stakeholders emphasized the importance of access to the ports, reliability of travel time, and ease of navigation (wayfinding) for freight movements.

As the only continuous interstate on the West Coast, I-5 is critical to the local, regional and national economy. At the Columbia River, I-5 provides a connection to two major ports, deep-water shipping, up-river barging, and two transcontinental rail lines. Both the Ports of Portland and Vancouver and much of the Portland/Vancouver region's industrial land are within the I-5 Trade Corridor. Both ports access the interstate within the BIA.

A 2005 *Cost of Congestion report* concluded that failure to invest adequately in transportation improvements would result in a potential loss valued at \$844 million annually by 2025 and cost the region 6,500 jobs. The report also found that regional investment in transportation would generate a benefit of at least two dollars for every dollar spent

Traffic modeling performed as part of the CRC project indicated that passenger vehicle volumes were expected to increase by 29 percent, while large truck volumes were expected to increase by 77 percent. Data showed that more than \$40 billion worth of freight moved across the Interstate Bridge each year, and was expected to increase to more than \$70 billion by 2030. Nearly 75 percent of the freight trucks crossing the Interstate Bridge used one of the seven interchanges in the project area.

Trucks were found to be more likely than other vehicles to be involved in a crash on a per vehicle basis. More than a third of the truck crashes involved sideswipes, compared to only 14 percent for all other vehicles. Congestion in the BIA and the closely spaced and outdated interchange designs, were identified as contributing factors to this accident history, and persist today. The CRC Project team coordinated with the freight community through development of the Freight Working Group.

Mobility for Transit, Pedestrian and Bicycle Travel

Improving transit and non-motorized transportation options—multimodal transportation—was an objective of regional agencies and stakeholders and influenced the identification and selection of project components. At the time of the CRC project, existing transit service across the Columbia River was provided by express buses connecting park and ride facilities in metropolitan Vancouver to major employment centers in Portland, leaving a significant gap in service to meet the forecast demand. The northern end of TriMet’s MAX Yellow line was and remains at Expo Center – within the southern boundary of the CRC project area. At the time, the MAX light rail system, including the Yellow Line, had about 52 miles of track providing fixed route service that connected downtown Portland to Gresham, Portland International Airport, Clackamas, Beaverton, Hillsboro and Expo Center.

Highway interchanges, the bridge sidewalks and other outdated facilities within the Bridge Influence Area were identified as an impediment to pedestrian and bicycle mobility during CRC project planning. To meet standards and expectations for the safety and connectivity of these facilities, pedestrian and bicycle improvements were integrated into the design of the new facilities, typically comprised of connections to existing and proposed on-street facilities and trails. Many of the improvements were integrated into highway and transit components.

Section 4:

Funding and Finance

Introduction

During prior project planning, a broad range of possible funding and finance options were considered and analyzed, and reviewed with project leadership, stakeholders and funding agencies. The CRC Project had developed a viable, externally validated funding and finance plan that included tolling, federal transit funds, and proposed state contributions. This funding and finance section includes:

- A summary of the evolution of the funding and finance options and plans;
- A review of tolling assumptions, analysis and plans developed during long-range planning and CRC Project development; and
- A review of the major Federal sources of funds that were considered during CRC Project development and the results of efforts to secure those funds.

This section also provides a short summary of funding and finance findings from prior project planning.

Funding and Finance Plan Evolution During CRC Project Development

Funding and finance options were reviewed and developed iteratively throughout prior project planning efforts. The CRC Project participating agencies endeavored to take a holistic look at the project and to develop an equitable funding strategy through which the States would share cost and funding responsibilities approximately equally. The aspirational targets of this funding strategy assumed that:

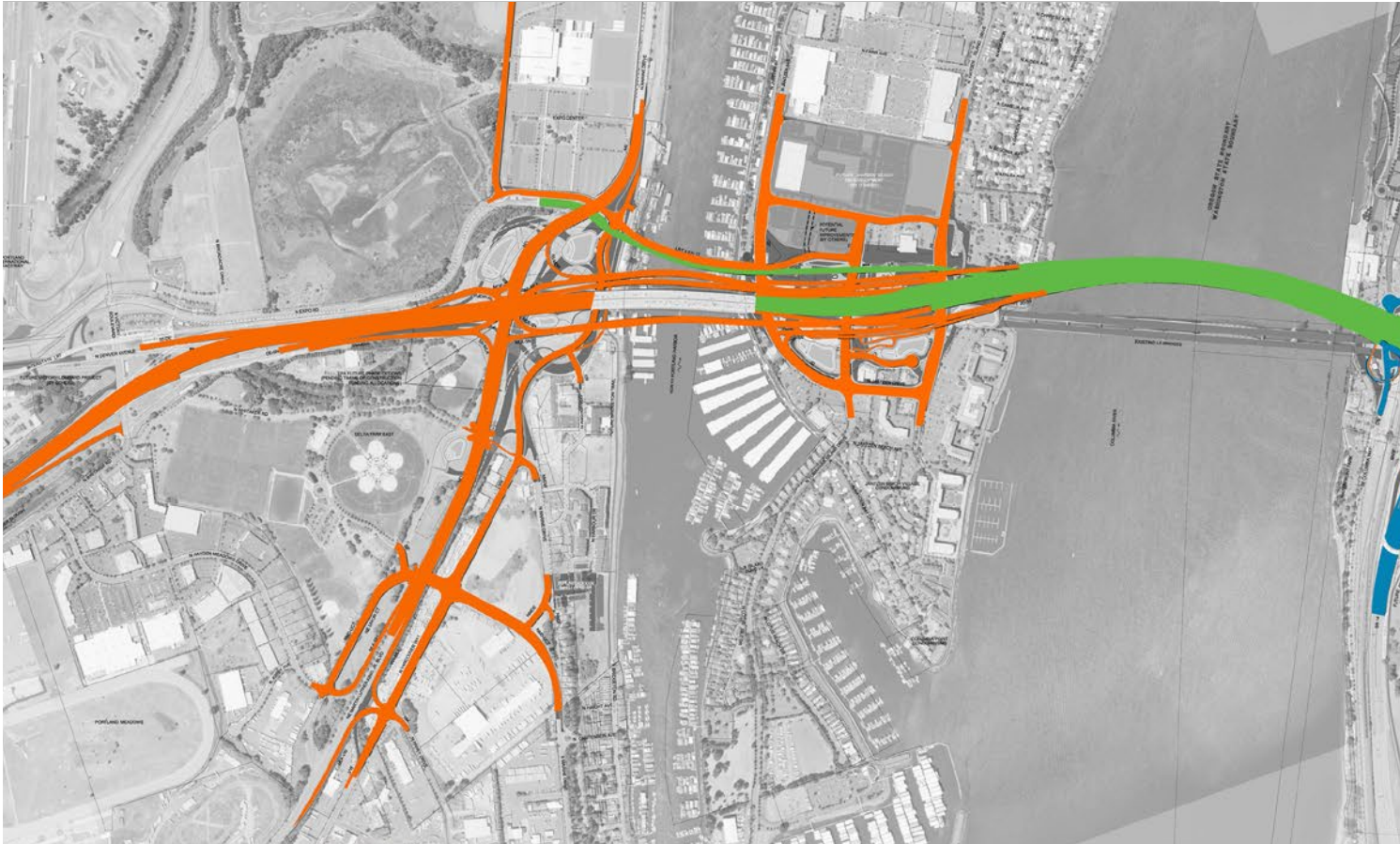
- Roughly one third of the funding would be secured from Federal sources;
- Roughly one third of the funding would be generated by user fees (tolls);
- The remaining one third of necessary funding would come from state identified sources, roughly split between the states.

Funding & Finance of Large Capital Projects: A Primer

Development of the funding and finance plan often follows a process that begins with the early commitment or target identification of major sources of funds, with the remaining amount needed referred to as the funding gap. The remaining potential sources are then prioritized as options to fill the gap based on criteria such as:

- the total and annual amount of funds that the source could generate;
- the percentage of total funding requirement the source could generate;
- the competitiveness of the project for the source;
- restrictions or additional obligations associated with the source.

The process is iterative as new information becomes available about the sources of funds and/or the project scope. A financing plan is typically developed in parallel to the funding plan based on assumptions about the timing of revenue and expenditure streams. The CRC Project team led the development of the funding and finance plan, drawing on WSDOT and ODOT experience in working with the U.S. Department of Transportation (and Congress) in the development of funding plans for major transportation investments (as the authorized representatives between their states and the Federal Highway Administration).



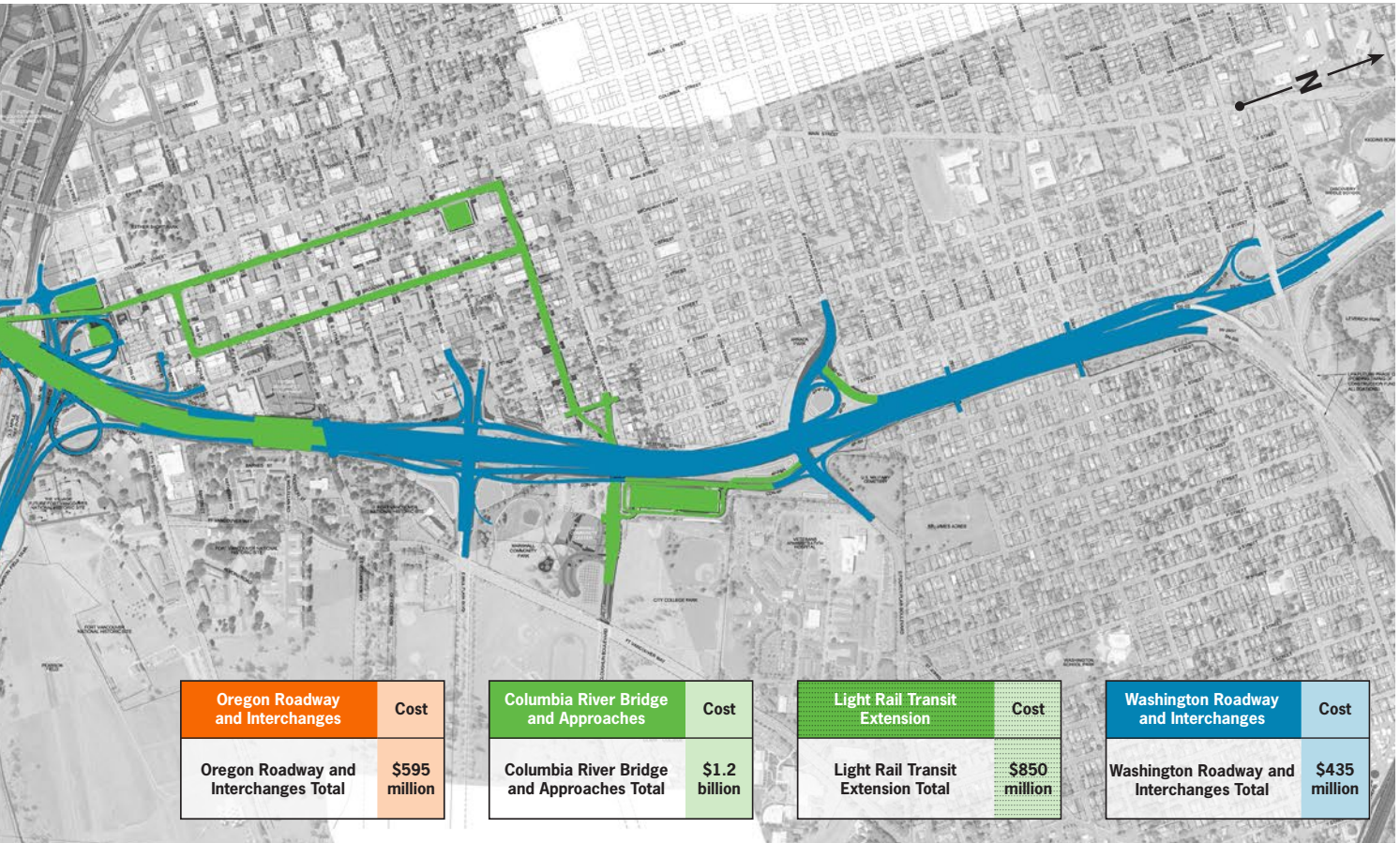
Project costs were summarized by component to inform the funding and finance plan.

Over the course of CRC Project development, plans were revised as needed to reflect the most current forecasts of the ability to secure funds from each of these sources, but the “three legged stool” of Federal, state and toll revenue sources was maintained.

To illustrate the evolution of the finance plan over the course of project development, two significant steps in the CRC Project development of funding and finance plans are summarized below: a comprehensive review of funding conducted early in project development, and the analysis and outcomes of financial work as the viability of funding sources became clear over time. Additional subjects covered include tolling analysis and capital funding potential as well as takeaways from CRC Project planning that may be helpful in considering a new project.

Early Review of Funding and Finance Options

The need for tolling as a major source of funds was identified early in the long-range planning process. The CRC Project looked comprehensively at non-toll funding and financing options in 2006, recognizing that significant additional sources of funds would likely be required, even with tolling. The *CRC Funding & Finance Options White Paper* (2006) identified all federal, state and regional funds that could be considered for funding either highway or transit components of the project, addressing the criteria above, as well



as information about the competitive or formula processes for allocation of the funds (as applicable). This analysis served as a starting point for the CRC funding and finance plan. The project team maintained this level of awareness of possible funding sources throughout project development and updated the plan as needed to respond to feedback from the public, stakeholders, the legislature, and findings of formal finance plan reviews, such as the Oregon Treasurer’s review. Key findings included:

Federal Sources

- Federal earmarks for highway projects are typically small and are competitive, but there were precedents for large earmarks of over \$100 million, particularly for projects recognized as projects of national significance (the CRC Project was so recognized in 2008 and again in 2012).
- State DOT Apportionments of Federal Highway Funds could be a source of significant capital funding, but they are allocated programmatically statewide (within each State), making it unlikely that a major portion of such apportionments could be allocated to a megaproject.
- The FTA New Starts program was considered a viable source for major capital funding of a transit component; it was considered likely that transit improvements in the Bridge Influence Area would be competitive for this source of funds, given the underlying transit and land use characteristics of the area.

- Regionally-allocated Federal sources (Congestion Management and Air Quality (CMAQ) and Surface Transportation Program (STP)) were considered viable on a small scale; many state and local projects compete within the region for funds from these sources, and typically the regional bodies responsible for allocating the funds are not inclined to crowd out smaller projects with large allocations to major projects.

State Sources

This funding review noted that existing sources of funds for ODOT and WSDOT were largely committed; significant State contributions to the project would have required Legislative action and some potential sources of funds may require authorization through a ballot measure.

Regional & Local Sources

Several potential regional or local sources that are authorized under State law and have the potential to generate new revenues for the project were identified, but it was also noted that these were sources that would require legislation and/or a local popular vote to be enacted (per the terms of their enabling legislation.)

Financing and Partnerships

Several financing options were identified, including direct Federal credit assistance through the Transportation Infrastructure Finance Act (TIFIA); State-administered Federal credit assistance (State Infrastructure Banks and Section 129 loans); and private market financing instruments such as Grant Anticipation Revenue Vehicles and Certificates of Participation. Each of these financing tools represents a way to reduce the cost of borrowing, which increases the purchasing power of revenue sources identified for the project, and in this way can help to close a funding gap.

The paper also discussed public-private partnerships (P3) in general. A P3 is a performance based contract between the public sector (any level of government) and the private sector (usually a consortium of private sector companies working together) to arrange financing, delivery and typically long term operations and maintenance (O&M) of public infrastructure. Public-private partnerships are authorized in Oregon; in Washington, the authorizing legislation precludes private sector debt financing. The paper did not analyze the viability of P3 for the CRC project but it did identify some important considerations. These include the need for the public sector to consider whether to relinquish long-term toll revenues pursuant to a negotiated up front contract with the private sector in exchange for an initial infusion of cash and to determine the viability of alternative project delivery methods which are associated with P3.

In 2011, the Washington State Joint Transportation Committee analyzed the concept of P3 as a funding mechanism for a handful of WSDOT projects. Their report found that in certain circumstances P3 could be beneficial to the state (report available at http://leg.wa.gov/JTC/Documents/Studies/P3/P3FinalReport_Jan2012Web.pdf). However, the report cautioned that, “P3 should not be viewed as the panacea to the State’s budget woes. Nor should a P3 be viewed as a means to close a budget gap by selling off assets.”

Specific to the I-5 Columbia River Crossing project, the JTC report estimated there would be a funding gap under all of the P3 scenarios analyzed. Of all the scenarios, the P3 Design Build Finance Operate and Maintain toll concession model generated the highest value for money but still had a funding gap of \$1.25 to \$1.48 billion. Therefore, for the CRC Project to have used P3, it would have had to be combined with other funding sources (federal and state).

Due to the contractual provisions associated with engaging a private partner, P3s are often the sole funding source for a project. These provisions can reduce or change state control of how an asset is operated and maintained. Contractual provisions could include performance expectations for the private entity to conduct operations and maintenance activities and penalties for non-performance. These provisions effect funding capacity from the P3 to the project and could create an incentive for the P3 to seek cost saving opportunities in their performance of these duties.

Summary of Funding and Finance Plans Presented in the FEIS Finance Analysis

The Final Environmental Impact Statement (FEIS) for the CRC Project presented a summary of potential capital revenue sources from federal, state, and tolling. By the FEIS milestone, regional sources had been eliminated from consideration for capital funding, with regional funding assumed to be a source for transit operations and maintenance needs.

Key financial assumptions in the *FEIS Financial Analysis* included:

- The project anticipated that \$400 million in discretionary highway funds was to be secured in the upcoming period for reauthorization of transportation funding; it was expected this funding would be provided in four \$100 million installments.
- The project was requesting \$850 million in FTA New Starts funds, with an expectation of \$100 million in annual disbursements.
- The FEIS financial plan assumed a \$900 million aggregate contribution from ODOT and WSDOT sources; the cash flow analysis assumed these state contributions would be early funding streams used prior to toll revenues/toll bond proceeds (which would reduce total borrowing requirements and the cost of borrowing).
- Based on a range of possible toll rates, financing assumptions, delivery schedules and traffic forecasts, tolls were anticipated to contribute \$0.93B to \$1.57B to

capital construction costs with the potential for an additional \$0.2B funding from pre-completion tolls. These were pre-investment grade level analysis estimates. The toll revenue stream would have been borrowed against to provide funding during construction; toll revenues would have repaid these bonds or loans. (Net toll revenues exclude the toll revenues used to pay the operating and maintenance costs of toll collection and the facility. In addition, net toll revenues must provide coverage of bond debt service.)

The FEIS identified an implementation schedule for capital financing actions such as State Legislative approvals for tolling and for state financial commitments, application for a TIFIA loan, congressional action on a Transportation Reauthorization Act including highway discretionary funding, FTA Approval of a Full Funding Grant Agreement for Section 5309 New Starts Funds, and potential pre-completion tolling of the corridor. As part of the New Starts process, the FTA requires applicants to demonstrate that other proposed sources of funds are secured or have a strong likelihood of being secured.

The FEIS Financial Analysis also analyzed and presented information on operations and maintenance costs for all components of the project.

Funding and Finance Plan Revisions

After the publication of the FEIS, CRC Project leadership made additional revisions to the funding and finance plan. The assumption that the finance plan would include a discretionary Federal highway funding appropriation was eliminated from the plan, as Congress had not moved forward with a major transportation reauthorization bill and the likelihood of receiving a \$400 million grant was low. To accommodate this reduction in funding, the project explored cost reductions through scope adjustment, and funding enhancements through adjustments to tolling assumptions. The major adjustments were to introduce “pre-completion tolling” into the financial analysis, such that tolling would be implemented prior to completion of construction, and small adjustments to the toll rate assumptions.

Tolling Assumptions, Analysis and Plans

Tolling Recommendations from Long-Range Planning

The importance of tolling as a funding source was established in the long-range planning process. The I-5 Trade and Transportation Partnership Strategic Plan stated:

Transportation funds are limited. Paying for improvements in the I-5 Corridor will require new funds. The scale of improvements needed in the corridor far exceeds presently available state and federal funds. These sources can contribute but cannot completely pay for the improvements. Assuming the current structure of public funding, tolling will be required to pay for a new Columbia River crossing and other corridor improvements. From a historical perspective, tolls are not new. Tolls were used to construct the original I-5 bridges.

Tolling Analysis

Tolling of cars and trucks that use the I-5 river crossing was included in the CRC project as an essential funding source that could help manage congestion. A *tolling analysis* was performed in iterations parallel to the project development process. The identification of components early in project development included an option for congestion pricing on I-5, introducing the possibility that tolling could be used to potentially reduce peak period congestion, in addition to providing revenues that would be a major source of capital funding.

An investment grade analysis (investment grade traffic and revenue analysis) is structured to meet the expectations of the bond market and potential private lenders. The analysis is conservative to engender confidence from lenders that the repayment schedule will be met, and the analysis must be conducted in reasonable proximity to the time when toll-backed bonds are expected to be issued.

Based on national and WSDOT experience with tolling, an early assumption was made that toll collection would be conducted electronically – with no toll booths. Although there was public concern about the viability of this approach, especially in relation to out-of-area travelers, there were examples, and are more now, that tolls can be collected from those with and without toll accounts. To understand the potential contribution of tolls to capital construction costs, toll revenue forecasting included:

- gross toll revenue forecasts: estimates of total potential toll revenue based on all vehicles paying their toll;
- net revenue forecasts: estimates of the portion of revenues available for repayment of debt, including estimates of the tolls that are expected to be collected, cost of collection (credit card and banking fees), costs for toll collection and facility operation and maintenance for the bridge and roadway, and essential expenditures to ensure the facility can continue to collect tolls
- financial capacity of net revenue: identifies the amount of capital funding for construction that can be supported through borrowing backed by the net toll revenue stream.

Initially, these steps in the analysis were conducted at a pre-investment grade level, using processes and assumptions from comparable projects, throughout the project development process. To borrow against a toll revenue stream, an investment grade traffic and revenue analysis is required (see summary box above).

The tolling analysis performed for the FEIS Financial Analysis examined the potential levels of project funding from tolling. It considered several tolling scenarios that differed by the toll rate schedule (i.e., the toll rate for a given hour of the day for a particular class

of vehicles) and whether tolling would start after completion of the new southbound I-5 bridge (post-completion tolling) or earlier (pre-completion tolling).

Federal and Legislative Authorization of Tolling

Federal law on tolling is established in 23 U.S.C. 129. It allows states to toll a bridge on the Interstate System when it is either being replaced or reconstructed. Federal statutes delegate to the states decisions regarding toll rate schedules and the time when tolls can first be charged, except that tolls may not be imposed prior to awarding the initial construction contract—in other words, “pre-completion” tolling is allowed, but cannot significantly precede the start of construction of a new or reconstructed facility. The decision when tolls will no longer be collected is also reserved for the states. As a prerequisite to tolling the I-5 bridges, WSDOT and ODOT would be required to enter into a tolling agreement with FHWA. This tolling agreement would require that toll revenues be first used for debt service and the operation and maintenance of the bridge.

State statutes provide that the toll rate schedule for the I-5 bridges (i.e., the toll rates by time of day, day of week, vehicle classification, and applicable discounts, if any) must be formally set by the state transportation commissions through specific processes set in state law and further detailed in a *bi-state agreement* between the Washington State Transportation Commission and the Oregon Transportation Commission. At the time of the FEIS, ODOT had general statutory authority to toll facilities it owns, potentially including the I-5 bridges (although jointly owned by both states), but did not operate any toll facilities. Under Washington law, WSDOT is provided tolling authority on a project by project basis; the Legislature authorized WSDOT to toll the I-5 bridges in the 2012 session ([RCW 47.56.892](#)).

External Review and Validation of Tolling

In 2009, the Washington State Legislature requested that a bi-state *Toll Study Committee* be convened to better understand the traffic effects, funding contribution, and public awareness and input about tolling to build the CRC project. In addition to hearing from the public, the scenario analysis found:

- Tolls could contribute a significant amount of funding to the project but could not be the only funding source.
- Toll rates could only be raised so high before total revenue and project funding would have decreased.
- State backing of debt would maximize the capital funding contribution from tolling.

In 2011, the Debt Management Division of the Oregon State Treasurer’s Office conducted a financial plan review which included review and evaluation of cost estimates, traffic and toll revenue forecasts, finance plan assumptions and legal issues regarding governance and ownership primarily related to tolling and toll backed borrowing. The review found:

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- the cost estimating process was sound and appropriately dealt with risk;
 - key assumptions in the DEIS traffic and revenue forecast were outdated given the unanticipated depth of the recession that was underway (2011), conducting an investment grade analysis would address these issues for toll estimates;
 - a potential toll revenue reduction based on a more conservative toll bond debt structure could be significantly offset through tolling the I-5 bridge in advance of project completion and using the federal Transportation Infrastructure Finance and Innovation Act (TIFIA) program (as the primary loan funding approach);
 - other funding sources (federal, state and transit operating funds) were critical and time sensitive; and
 - a robust toll-setting mechanism was necessary to assure all toll debt service would be paid in full annually by toll revenues.

The CRC Project team convened meetings of the debt managers of both state treasury offices and the chief financial officers of both state DOTs as needed to review and advise on the finance plan especially related to tolling and toll backed borrowing. These critical advisers oversaw the procurement and selection of the consultant that conducted the investment grade traffic and toll revenue analysis. They also oversaw this analysis effort, the subsequent net toll revenue analysis and borrowing assumptions included in estimations of project funding capacity of these net toll revenues.

The *investment grade traffic and toll revenue analysis* was performed and demonstrated that toll revenue would provide sufficient funding to allow for construction of the project as defined in June of 2013 as a bi-state project as well as in January of 2014 as an Oregon-led project. The scenarios analyzed would have provided a range of net project funding of between approximately \$1.35 billion (state-backed toll revenue bonds) and approximately \$1.57 billion (TIFIA plus state-backed toll revenue bonds) under then current market conditions and assuming the expenditure of pre-completion tolls on a pay-as-you-go basis. This analysis assumed a variable toll rate for pre-completion that would range in FY2016 from \$2.00 to \$2.50, escalating at the national inflation rate of 2.5% per year until the replacement bridge was open to traffic. No tolls were assumed to be collected during pre-completion overnight hours (8 pm to 5 am). After this, forecast for FY2022 toll rates would range from \$2.60 to \$3.25, be collected all hours and no longer be increased annually with inflation.

After reviewing the December 2013 investment grade analysis, *net revenue analysis* and *funding capacity analysis*, the Oregon Treasurer concluded that: “if the assumptions underlying the projections made by the consultants are valid, the tolls will be sufficient to service the project bonds.”

The project had been approved by the Washington Legislature and by the Oregon Transportation Commission as an eligible toll project. The Washington and Oregon

Transportation Commissions had executed a toll rate setting agreement that laid out the basic structure between the states for toll rate setting. Additional agreements between the states would have been necessary to implement tolls. Toll collection and administration discussions had been conducted between the states to consider specific toll gantry locations, back office business processes and bi-state toll borrowing needs. Technology interoperability was also part of the discussions between the states.

Future Prospects for Federal Funding

The CRC Project pursued the potential for significant Federal funding from both transit and highway sources. The CRC Project was performing competitively in pursuit of transit funds through the FTA New Starts capital investment grant program. FTA issued a funding recommendation of \$850 million for the CRC Project in the FY 2013 President's Budget and in the Secretary of Transportation's FY2013 Annual Report on Funding Recommendations (see https://www.transit.dot.gov/sites/fta.dot.gov/files/FY13_Annual_Report_on_Funding_Recommendations.pdf.) FTA rates projects, in part, on the proportion of federal funding to be invested in the project. In the 2013 report, the highest proposed share of New Starts funding for any other New Starts project recommended by the FTA was under 60%. The CRC project was requesting \$850 million and estimated transit-related capital costs would be up to \$940 million of the up to \$3,600 million total project cost. Therefore, the project was anticipating about 90% of transit capital costs to be covered by New Starts funding. Senator Patty Murray authored bill language recognizing the unique nature of the CRC Project in the determination of the New Starts share rating (contained in Section 173 of the Transportation, Housing and Urban Development Appropriations Act of 2010). This Act directed the FTA to base the New Starts share



and New Starts share rating for interstate, multi-modal projects located in an Interstate highway corridor on the unified finance plan for the multi-modal project rather than only the transit element of the plan. Following this direction, the FTA assigned a 24% New Starts share of project funding and a rating of “high” for this factor in their overall project rating. For comparison, the Portland-Milwaukie light rail project (now complete) showed a 50% New Starts funding share, which resulted in a “medium” rating for this same factor.

Highway funds were believed to be a possibility through an earmark for the project given presidential recognition of the project’s national significance and sustained support from the Washington and Oregon Congressional delegations. During the CRC project, potential Federal funding was initially evaluated in the context of the surface transportation authorization bill known as SAFETEA-LU (Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users) adopted in 2005, which provided funding and program authorization through 2009. After the expiration of SAFETEA-LU, there were several years of interim re-authorizations of transportation spending, without a long-term funding plan. As there was no action on a significant new surface transportation authorization bill while the CRC Project funding plan was being developed, it was concluded that the federal highway investment would not reliably be achieved within the necessary funding window. In 2011 Congress began observing an earmark ban; potential for this type of funding in the future is unclear.

Since December 2015, Federal transportation programs have been funded pursuant to the authorization in the Fixing America’s Surface Transportation Act of 2015, or “FAST Act.” The FAST Act was the first law since SAFETEA-LU in 2005 to provide long-term funding certainty for surface transportation. The FAST Act authorized funding levels through FY 2020. The act sets expectations for funding for several programs but appropriation of funds at the authorized levels requires Congressional action in each Federal fiscal year. The act does include competitive grant funding for nationally significant freight and highway projects (the Infrastructure for Rebuilding America [INFRA] program) and funding for transit grants like New Starts. The New Starts funding program requires projects to progress through multiple steps in a rigorous, progressive evaluation process. Although the CRC Project had progressed into Final Design, now referred to as Engineering, the project is no longer reflected in annual reports. Any potential to rely on previous work conducted is unknown and would need to be discussed with the Federal Transit Administration. A new project may need to start at the beginning of the New Starts process.

Given that FAST Act authorization extends only through FY 2020, the long lead time for participation in competitive Federal grant processes, and that there is no current commitment to a specific renewed project, it may not be likely that a new project would be able to secure a spot in the queue for FAST Act funds, but rather would need to be queuing for the next major authorization package.

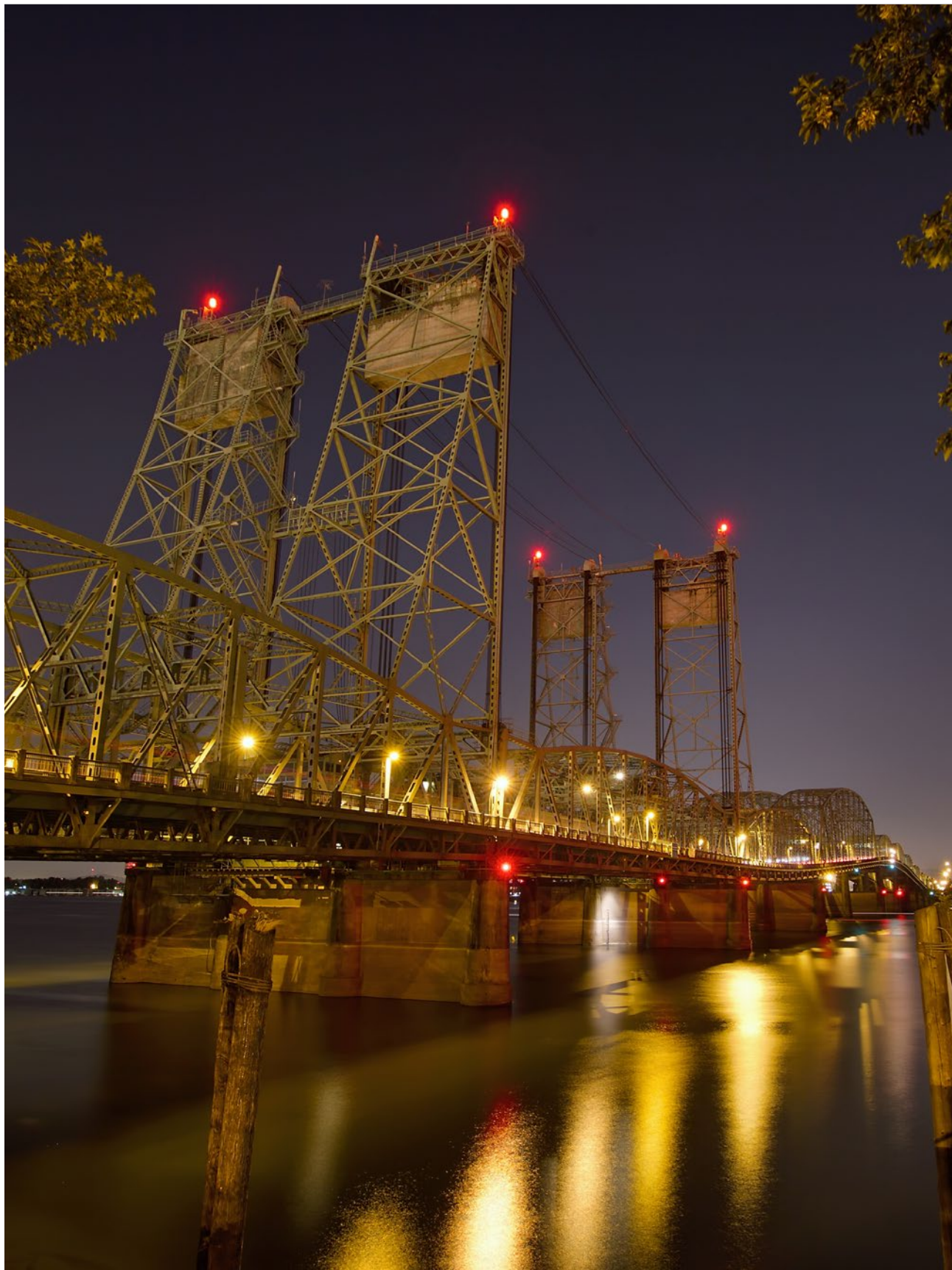
The takeaway from the CRC project about the potential for major Federal funding is that there is no guarantee that federal funds will be available. National transportation packages are unpredictable in their timing. There is likely to be significant uncertainty about the ability to secure Federal funding throughout the project development process in a timely manner that is reliable enough to incorporate into project finance scenarios.

Funding and Finance: Key Findings

Funding and finance strategies would also be a key element of a new bridge project. Some funding and finance findings from the prior project including:

- Traditional capital funding sources and programming approaches that are available to the state DOTs for highway projects are not sufficient for a megaproject given other transportation needs across the states. Funding a megaproject would require the consideration of alternative revenue and financing sources such as tolling, FTA New Starts grants, and Federal loan programs that introduced additional schedule requirements, responsibilities, oversight and complexity.
- Funding and finance plans that involve multiple sources of revenue involve complex schedules for the authorization of funding and financing. A key challenge is to achieve certainty about each major funding source within a reasonable timeframe for project decision making.
- Federal agencies that provide funding or loans seek to be the “last money in” to a project. This creates complexities for a megaproject that is seeking funding or financing from multiple Federal sources.
- Financing toll revenues for capital construction funding requires rigorous analysis to satisfy the credit markets. The analysis has a short shelf life; it must be completed near to the time when borrowing will occur to engender investor confidence.
- Funding and finance plans require multiple iterations, because their development is parallel to the development and refinement of alternatives, cost estimates and phasing plans.
- The timing of project expenditures and revenue streams are not likely to be perfectly matched, which introduces financing (borrowing) requirements.
- The bi-state and multimodal nature of a bridge crossing the Columbia River introduces considerations related to the allocation of costs, funding and risk between the States and transit agencies and to project components. Agreement is needed between the two states that defines the allocations, and the earlier this agreement is made the easier it is to settle on the funding and finance plan. Factors that influenced the complexity of funding and finance during prior project planning included:
 - the geography of the Bridge Influence Area; a majority of the infrastructure is located within Oregon;
 - Washington has a sales tax, which impacts the cost of facilities to be constructed in the state;

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- Innovative financing and project delivery options, such as P3 or GC/CM, may require legislative action; the extent of action differs between the States.
 - Some sources of funds are limited to either highway or transit uses; costs of an integrated multi-modal project require allocation to highway and transit uses to inform the use of different fund sources for payment of these costs.
 - Leveraging toll revenues through the issuance of debt is made more complicated in the context of a bi-state project. For both States to borrow against a portion of the toll revenues, each state needs explicitly defined access to these revenues for repayment as part of the revenue bond financing process (in which bonds are backed solely by project revenues, rather than by a general obligation of the state). State laws addressing the treatment of the toll revenue require coordination in the debt financing process.



Section 5:

Project Management, Leadership and Coordination

Introduction: Management, Leadership and Coordination of Complex Projects

Prior long-range planning and project development each featured extensive participation across all levels of government and by varied interest groups and stakeholders. The State DOTs, as the organizations formally authorized to manage interstate highway facilities, and state routes on the National Highway System through coordination with the Federal Highway Administration, served as the primary project owner with responsibility for managing project development. The CRC Project team also included the local transit agencies, metropolitan planning organizations, and cities, supported by engineering and environmental consultants. The CRC Project team used a variety of coordination and external validation processes to ensure participation and gain support and/or approvals required to advance the project. This section summarizes these management, leadership and coordination processes, which provides a foundation and potential framework for the extensive cooperation and shared leadership responsibilities that can be expected for a renewed project.

Like the prior project, a new I-5 Bridge over the Columbia River would require a management, leadership and coordination structure that addresses the complexities of:

- a bi-state project;
- a megaproject requiring significant funding commitments;
- impacts and benefits at the local, regional, statewide and national level;
- requirements for the analysis of environmental effects under the jurisdiction of multiple local, state and federal agencies; and
- ongoing maintenance and operations requirements of the facility and assets..

Project Management and Leadership Roles

SSB 5806 sets forth a legislative work program that includes “reviewing and confirming lead roles related to permitting, construction, operation and maintenance of a future Interstate 5 bridge project.” This section reviews the project management and leadership roles established during prior project planning to inform this review.

Throughout the long-range planning and CRC project development processes, Oregon and Washington worked effectively together through the leadership of state and local elected officials and the cooperation of agencies including the state Departments of Transportation (ODOT and WSDOT), regional planning agencies (Metro and SWRTC), transit agencies (TriMet and CTRAN) and municipal governments (Cities of Vancouver and Portland). Central to effective coordination was the creation of a co-located project

office with strong agency leadership and an integrated consultant team. Private sector and community stakeholders also participated extensively in these processes.

States of Oregon and Washington

The governors of Oregon and Washington provided ongoing project leadership through their Departments of Transportation, and established the framework for broad-based project leadership through the establishment of key coordination and external validation groups, including the CRC Task Force and the Independent Review Panel, as discussed further below. At key project milestones, the Governors made joint decisions on select project issues. For example, the governors made the selection of the bridge type for the crossing, after detailed analysis and input from a Bridge Review Panel and the CRC Project team, as described further in **Section 6: Project Development**.

In 2011, the Oregon state legislature created a Joint Legislative Oversight Committee (a joint committee of Oregon House & Senate) on Columbia River Crossing. This 10-member committee was charged with reviewing and providing oversight on all aspects of the CRC project, including the project's finance plan. The group provided oversight through meetings, hearing from the public and consideration of project presentations and reports through mid-2013 when the transition occurred to consideration of an Oregon-led project.

In their 2012 State Transportation Budget, the Washington state legislature directed the Joint Transportation Committee to form a Columbia River Crossing Oversight Subcommittee to review project and financing information, and to coordinate with the Oregon legislative oversight committee. The group met four times in 2012 and heard testimony from the public. In mid-2013, they received an update on the shut-down process specific to Washington participation and how work already completed might be available for use if and when the project was re-opened.

Oregon and Washington Departments of Transportation

ODOT and WSDOT provided management and expertise in project planning, engineering and interagency coordination to advance the project through the technical work and the decision-making steps associated with project development. The DOTs, working from a co-located CRC Project office, drew on experience from implementing other major highway and bridge projects in both states, formalized relationships and coordination procedures for working with the U.S. Department of Transportation, and experience working together to build and maintain existing interstate bridges, pursuant to several interstate agreements. The DOTs participated in an FHWA-led tour of other megaprojects around the country (as further described in **Section 6: Project Development**), which shaped the project and how the DOTs approached it, including office co-location; rigorous, ongoing estimating; and early, ongoing and robust engagement with citizens and agency partners.

Long-range planning had been initiated at the regional level, through the Bi-State Transportation Committee established by Metro and the Southwest Washington Regional Transportation Council (the metropolitan planning organizations for Portland and Vancouver, respectively), then advanced by a broad-based Portland/Vancouver I-5 Trade and Transportation Task Force established by the governors of Oregon and Washington. Pursuant to the recommendations of that Partnership Task Force, the governors proposed, and the Oregon and Washington Legislatures authorized funding for the DOTs to begin development of the project that was subsequently defined as the Columbia River Crossing Project.

Metropolitan Planning Organizations, Regional Transit Agencies and Cities

For the CRC Project environmental process, the co-lead agencies were WSDOT, ODOT, the Tri-County Metropolitan Transportation District (TriMet), the Southwest Washington Regional Transportation Council (RTC), Metro, and the Clark County Public Transportation Benefit Area (C-TRAN). These co-lead agencies, together with the cities of Vancouver and Portland, comprised the state, regional and local agencies that sponsored the project in the NEPA process. The participation of the local and regional agencies was important given their respective areas of jurisdiction. The transit agencies are the owners and operators of transit service within the Bridge Influence Area. The cities of Portland and Vancouver have jurisdiction over their local streets and land use. The metropolitan planning organizations are responsible for travel forecasting and for the allocation of regional funds.

Federal Agencies

Federal agencies played a significant role in the planning and environmental work for the project, and can be expected to play a similar role in any additional efforts toward construction of a new Interstate 5 bridge over the Columbia River. The federal role stems from a variety of responsibilities related to the corridor including:

- Interstate highway design standards and allocation of Federal highway funds (FHWA);
- the Federal role in funding transit capital investments, transit facility maintenance, and transit safety programs, including the extensive participation of FTA through the New Starts capital investment grant process if applicable;
- the role of the U.S. Coast Guard in maintaining navigable waterways (including bridge permitting authority);
- the role of the U.S. Army Corps of Engineers in maintaining waterway navigational capability and in constructing and maintaining levees;
- the role of the Federal Aviation Administration in maintaining flight paths in the vicinity of airports;

- the role of the National Marine Fisheries Service and U.S. Fish & Wildlife service in supporting the conservation and management of living marine resources and habitat pursuant to the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA))
- the role the National Parks Service in preserving historic and cultural resources per the National Historic Preservation Act—Section 106 requiring Federal agencies to identify, assess and resolve the effects of their undertakings on historic properties; and
- the role of the U.S. Environmental Protection Agency in protecting human health and the environment as per federal legislation relating to air, water, land, endangered species, and hazardous waste.

FHWA and FTA served as co-lead federal agencies for the NEPA process. As such, these agencies had the authority to approve and condition the project through a jointly issued Record of Decision subsequent to completion of a Final Environmental Impact Statement. FHWA and FTA also considered the interests and requirements of the other Federal agencies identified above. More information on the NEPA process, including steps that would likely be required if a new project is initiated, is provided in [Section 6, Project Development](#).

American Indian Tribes

During prior project planning, ODOT and WSDOT were fully engaged in government-to-government consultation with American Indian Tribes affected (or potentially affected) by the project. Consultation formally began in December 2005. The project team consulted with both the natural and cultural resource offices of each tribe and met periodically with tribal councils and committees. The tribal consultation process included seeking review and input from affected tribes to help resolve concerns at each of the major project milestones. In addition, tribal consultation included document review, in-person meetings and multi-tribal and /or multi-agency meetings.

Consulting Tribes at the time of the project included:

- Chinook
- Confederated Tribes of Grand Ronde
- Confederated Tribes of Siletz
- Confederated Tribes of Umatilla
- Confederated Tribes of Warm Springs
- Cowlitz Tribe
- Nez Perce Tribe
- Spokane Tribe of Indians
- Yakama Nation.

Ports of Portland and Vancouver

Both the Port of Vancouver and the Port of Portland have primary access to I-5 at interchanges within the BIA, which contribute to a large portion of truck freight travel in the corridor. Both ports participated through prior planning as well as CRC project development. Although not defined as project sponsors, they were key stakeholders. They were represented on the Task Force and participated in several project groups, including Freight Working Group and Marine Drive Stakeholders Group. Additionally, both ports coordinated closely with the CRC project team through project development and were key participants in managing the workplan that addressed LPA resolutions.

The Port of Portland is located where deep water shipping, upriver barging, two water-grade rail lines and two interstate highways converge. Port operations impact the entire Pacific Northwest. The Port of Portland's FY2015 economic impact study estimates that activities at Port facilities in total generate nearly 59,000 jobs and about \$350 million in state and local tax revenue.

The Port of Vancouver operates principally in two industries: terminal operations and industrial property leases. 2014 was a record-breaking year for the port and it shows in the most recent economic study: a total of 3,237 jobs were directly generated by port marine and industrial activities. Port business activities contributed \$102.7 million in 2014 state and local taxes.

Coordination Structure and Roles

During prior project planning, numerous interagency and advisory groups and coordination processes provided input and guidance to inform project development and decision making. The CRC Project also engaged the public directly through a robust outreach and communications program (described further in [Section 6: Project Development](#)).

Interstate Collaborative Environmental Process (InterCEP)

To manage the potentially unwieldy coordination of the state and federal resource agencies and transportation agencies in the CRC planning and environmental process, the parties developed an agreement to manage this coordination in a streamlined fashion. Through the [Interstate Collaborative Environmental Process](#) (InterCEP) agreement, the first of its kind in the country, the parties agreed on shared goals of predictability, through early and on-going coordination and collaboration. The InterCEP process included the participation of both the Oregon and Washington State Historic Preservation Offices and one representative from each of the federal agencies. The parties met regularly, with additional working group technical meetings, and identified key milestones for comment

and for concurrence. This structure provided transparency across Federal agencies in the issues that the project was addressing, which included overlapping and/or conflicting interests of the participating federal agencies. The structure InterCEP provided was also helpful to the FHWA and FTA as they developed the project Record of Decision, as it gave these lead agencies a clear understanding of the actions the DOTs had taken to inform and respond to the Federal resource agencies.

Columbia River Crossing Task Force

The governors of Oregon and Washington formed the 39-member *Columbia River Crossing Task Force* in 2005. The Task Force was comprised of leaders representing a broad cross-section of Washington and Oregon communities. Public agencies, businesses, civic organizations, neighborhoods, and freight, commuter, and environmental groups were represented on the Task Force. The group met 23 times to advise the CRC project team in development of the project Vision and Values and the statement of Purpose and Need, and to make recommendations at key decision points. The Task Force sunsetted in summer 2008 after making their recommendation on the locally preferred alternative (LPA) that included the following components:

- A new river crossing over the Columbia River for vehicles and freight, transit, bicyclists and pedestrians and I-5 highway improvements. Included improvements to seven interchanges, north and south of the river, as well as related enhancements to the local street network.
- 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.
- A new toll on motorists using the river crossing as a demand management and financing tool.
- Transportation demand and system management measures to be implemented with the project.

Project Sponsors Council

A *Project Sponsors Council* (PSC), comprised of senior representatives from the Washington State Department of Transportation, the Oregon Department of Transportation, cities of Portland and Vancouver, Metro, the Southwest Washington Regional Transportation Council (RTC), TriMet, and C-TRAN, was convened to provide continued formalized input to the CRC Project Team after the CRC Task Force completed its work. The group met

more than 20 times to advise on various issues including addressing agency resolutions on the LPA, design development, bridge type and phasing. The PSC was charged with advising the Departments of Transportation and the transit agencies on:

- Completion of the Environmental Impact Statement (EIS);
- Project design, including but not limited to: examining ways to provide an efficient solution that meets safety, transportation and environmental goals;
- Timelines associated with project development;
- Development and use of sustainable construction methods;
- Ensuring the project is consistent with Oregon and Washington's statutory reduction goals for greenhouse gas emissions; and
- A finance plan that balances revenue generation and demand management.

CRC Working Groups

The CRC project team also received input from seven advisory groups focused on:

- Community and environmental justice
- Freight
- Light rail in Portland
- Light rail in Vancouver
- Marine Drive interchange design
- Pedestrian and bicycle travel
- Urban design and bridge aesthetics.

The composition, purpose and focus of these advisory groups is summarized below.

Community and Environmental Justice Group

To achieve the goal of meaningful public engagement throughout the project development process, the CRC project team formed the Community and Environmental Justice Group (CEJG). The members of the CEJG came from neighborhoods in the project area and included environmental justice communities within the potentially affected project area (such as low-income and minority populations), and at-large members. They represented the diverse interests and perspectives of the Vancouver, Portland, and Hayden Island neighborhoods potentially affected by the project. CEJG recommended project outreach strategies and materials to help effectively reach environmental justice communities, and the community as a whole.

Freight Working Group

The Freight Working Group (FWG) advised on freight issues, providing insight, observation, and recommendations about the needs for truck access and mobility within the corridor. The FWG addressed horizontal and vertical clearances, acceleration/deceleration distances and needs, and stopping-performance needs of trucks; provided comments on the effect of geometric, regulatory, and capacity changes on truck movements in the corridor; and provided testimony and objective information about the effects of congestion on freight-related businesses and the businesses they serve. The group also provided feedback on the function and design of three Marine Drive interchange designs considered by the project as well as the Hayden Island interchange designs. The group met 24 times between 2006 and 2011, helping to guide refinements to interchange design to better meet the needs of the freight industry.

Pedestrian and Bicycle Advisory Committee

The Pedestrian and Bicycle Advisory Committee (PBAC) was established to advise on the development of improvements for people who walk or ride bicycles in or through the project area. The committee was comprised of 25 community members and agency representatives to develop recommendations to enhance facilities and connections for pedestrian and bicycle circulation. PBAC held its first meeting in March 2007 and met 22 times over its first two years.

In addition to reviewing proposed facilities on the project, the committee recommended a sufficient and sustainable maintenance and security program for the project's pedestrian and bicycle facilities.

Urban Design Advisory Group

The Urban Design Advisory Group (UDAG) advised on the appearance and design of bridge, transit, and highway improvements. This bi-state group was led by Vancouver Mayor Royce Pollard and Portland Mayor Sam Adams. The 14 members from Oregon and Washington contributed diverse professional and community perspectives on a variety of topics including architecture, aesthetic design, cultural and historic resources, community connections, and sustainability. The UDAG held its first meeting in December 2006 and met more than 17 times through 2009.

UDAG formalized their guidance in two documents, *Architectural Standards with Place Specific Requirements for bridges and landscape designs*, and *White Paper: Build a Better Bridge Faster*. The architectural standards provided design guidance for the highway structures including landscape elements.

Marine Drive Stakeholder Group

The Marine Drive Stakeholder Group advised the Columbia River Crossing project on designs to improve the safety and traffic operations of the Marine Drive interchange. In fall of 2009, the diverse group of stakeholders recommended a new alignment that called for the interchange to be rebuilt with additional ramps to improve safety. The alignment would enhance freight and vehicle safety and mobility, improve local street connections, avoid and minimize impacts to nearby wetlands and allow for future open space development. Pedestrian and bicycle access around the interchange would be more direct and easier to follow. The group met ten times between September 2008 and December 2009.

Vancouver Working Group

The Vancouver Working Group (VWG) was made up of community members (residents, business owners, transit-dependent populations and commuters) with an interest in light rail planning in Vancouver. The group met 14 times in 2009 to develop recommendations and provide feedback to the project team, the City of Vancouver and C-TRAN. The recommendations included a preferred North/South and East/West light rail alignment, station locations and design, and park and ride locations.

Portland Working Group

The Portland Working Group (PWG) was formed to provide the community perspective on design and planning for the extension of the MAX Yellow light rail line from the Expo Center to Vancouver. The group advised on issues related to design, mobility and access, transit planning, business and community outreach and impacts on businesses and neighborhoods for the Oregon segment.

Tolling Study Committee

The 2009 *Tolling Study Committee* (also discussed in **Section 4: Funding and Finance**) was created to study the CRC tolling scenarios and gather public feedback on tolling ideas for the project. The Committee, comprised of the Directors of ODOT and WSDOT, and the Chairs of the Oregon and Washington State Transportation Commissions, was charged with evaluating the expected traffic diversion and funding contribution associated with tolling Interstate 5 (I-5), building awareness and engaging residents and bridge users in this preliminary discussion, coordinating with the transportation commissions and departments from both states, and discussing a potential bi-state toll setting framework. The committee held two public listening sessions and two public work sessions in 2009 before submitting its final report on the scenarios to the Oregon and Washington governors and state legislatures in January 2010. The committee found that the tolling scenarios could raise a significant amount of funding, but could not be the only source of funding. They also found that there was a limit to the rate that could be set for tolls on I-5 only without significant diversion to I-205 that would result in a loss of toll revenue, and that State backing of debt was necessary to maximize the toll revenue funding contribution to the project.

Section 6:

Project Development

Introduction

The CRC Project included a multi-year project development phase that encompassed planning and engineering activities to develop and compare the costs and benefits of alternatives; stakeholder and public participation processes to develop the project components; and identification of impacts to meet both the intent and the legal requirements of the National Environmental Policy Act (NEPA) and other applicable Federal laws. These project development activities, characteristic of any major project undertaking, are time and resource intensive. The interrelated activities undertaken during the project development process and summary of the major activities and milestones of the CRC project development process from 2005 through 2013, spanning the initiation of the project (including the NEPA Notice of Intent) through the adoption of the Record of Decision, development of project delivery recommendations, and NEPA Re-evaluation of refined project elements is shown in the figures *Major Project Development Process* (page 80) and *CRC Project Development: Key Milestones and Decisions* (pages 82-83).

Major project development activities completed during prior project planning are summarized below in the following areas:

- Alternatives Development:
 - Framing the Problem & Establishing Evaluation Criteria;
 - Candidate CRC Project Components & Screening;
 - Alternatives Package Development and Screening;
 - Selection of the Alternatives to be Included in the DEIS;

Interrelated Activities During Project Development

Stakeholders help to define the project Purpose and Need as well as the screening criteria that will be used to evaluate alternatives.

Possible project components and features are generated in part through stakeholder coordination and outreach processes.

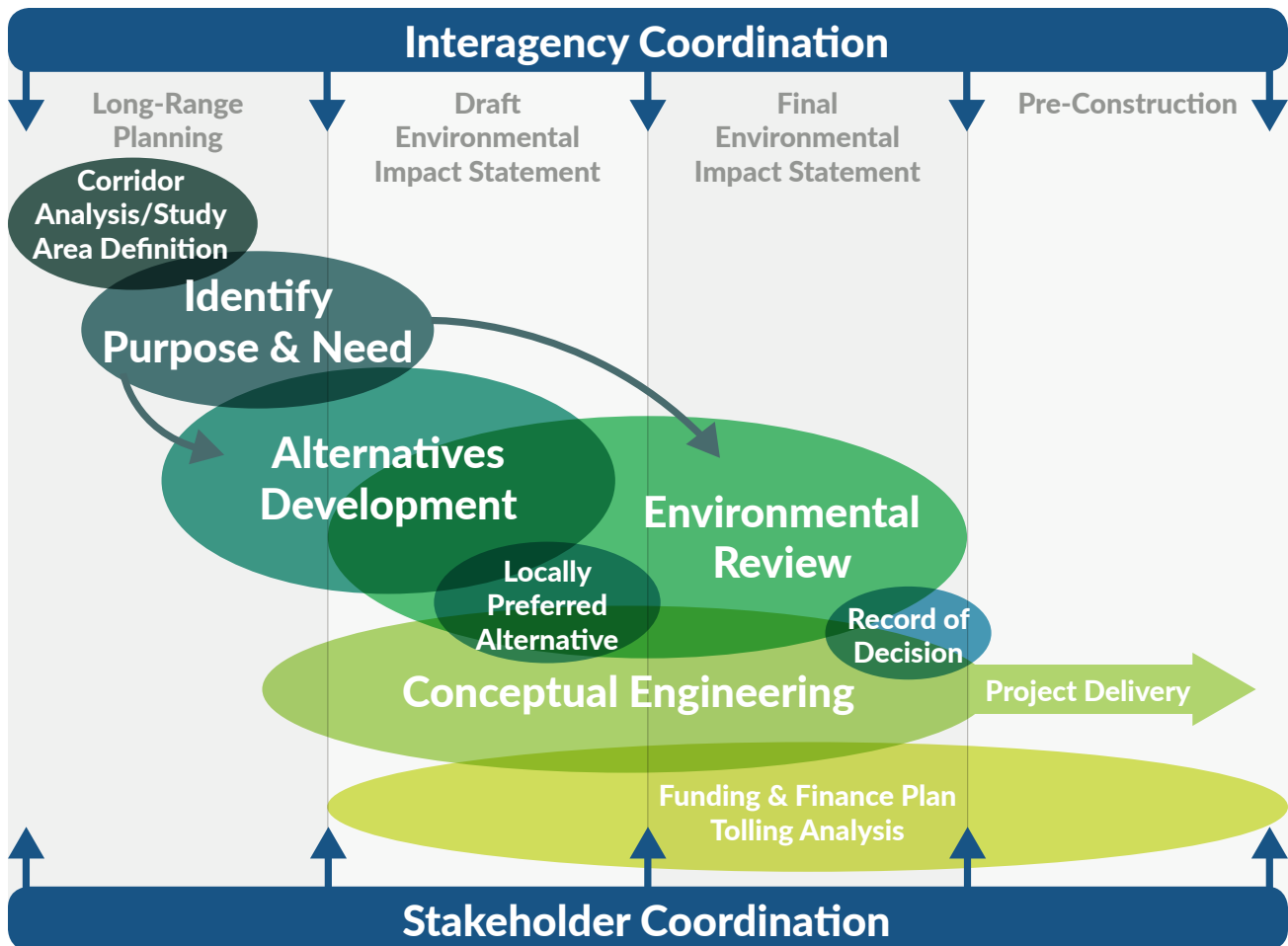
Conceptual engineering and operational analysis of these components identifies the costs, benefits and environmental impacts of the components.

Stakeholders review the findings from the conceptual engineering and analysis in an iterative process to make recommendations about the screening and packaging of components as alternatives.

The design of the components is refined periodically during this iterative process in an effort to reduce costs, improve performance, and/or reduce the impacts of the alternatives.

Funding and finance alternatives are developed and refined during project development, and with respect to the FTA Capital Investment Grants process, are themselves criteria by which the project is rated.

Major Project Development Process



-
- Selection of the Locally Preferred Alternative; and
 - Refinements to the Locally Preferred Alternative
 - Environmental Process and Environmental Permitting:
 - The CRC Project Record of Decision;
 - NEPA Reevaluations;
 - Interstate & Interagency Collaboration Processes;
 - National Marine Fisheries Service ESA Biological Opinion & Conservation Recommendations;
 - Section 106 Historic & Archaeological Resources Review;
 - United States Coast Guard (USCG) Bridge Permit;
 - United States Army Corps of Engineers (USACE) Section 408 Permit; and
 - NEPA Determinations (Reevaluations & Categorical Exclusions)
 - Conceptual Design and Preliminary Engineering:
 - Development of River Crossing options (tunnels, new and supplemental highway and transit bridges, and refinement of bridge type, size and location);
 - Test programs to identify the feasibility and impacts of bridge foundation design and construction options;
 - Highway Interchanges;
 - Bicycle and Pedestrian Improvements; and
 - Transit
 - Public Involvement
 - FTA Capital Investment Grant “New Starts” Process
 - Real Estate Acquisition Management Planning
 - External Review & Validation:
 - Cost Risk Assessment/Cost Estimate Validation Process;
 - Value Engineering Study;
 - Travel Demand Modeling Review Panel;
 - Greenhouse Gas Emission Analysis Expert Review Panel;
 - Independent Review Panel;
 - Bridge Review Panel; and
 - Oregon Treasurer CRC Finance Review.

CRC Project Development: Key Milestones and Decisions

| 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|
| <p>Adopted Vision and Values (TF)</p> <p>EIS Notice of Intent (09/27/05)</p> <p>Form CRC Task Force (39 Members)</p> <p>Adopted Problem Definition (TF) (12/05)</p> | <p>Approved Purpose and Need (FTA/FHWA)</p> <p>Screened and narrowed solution concepts - Step A (TF)</p> <p>Screened and narrowed solution concepts - Step B (TF)</p> <p>Developed, screened and narrowed preliminary alternatives (TF) - 12 Alternative Packages</p> <p>Alternative Evaluation Framework 23 River Crossing Ideas:</p> <ul style="list-style-type: none"> • 9 Passed screening • Movable spans/tunnel removed by task force • 4 Ideas remain for alternative packages <ul style="list-style-type: none"> ▫ Replacement (upstream/downstream) ▫ Supplemental ▫ Arterial • 14 Transit Ideas <ul style="list-style-type: none"> ▫ 4 Ideas remain for alternative packages <ul style="list-style-type: none"> · Express bus in G.P./M.L. · Bus rapid transit · Bus rapid transit - Lite · Light rail transit • 6 Freight Ideas <ul style="list-style-type: none"> ▫ 3 Passed to alternative packages • 18 TDM/TSM Ideas <ul style="list-style-type: none"> ▫ 10 Passed to alternative packages <p>CRC recommends 3 DEIS alts:</p> <ul style="list-style-type: none"> • No build • Replacement w/BRT • Replacement w/LRT | <p>Identified DEIS alternatives to analyze (TF)</p> <p>Proposed and received no conflicting comments on 95' vertical clearance for river crossing structures (CRC, USCG)</p> <p>Task Force Recommends Fourth Alternative w/ Supplemental</p> <ul style="list-style-type: none"> • Subcommittee of task force met 3 times between 02/07/07 & 03/27/07 • Recommended 2 new alternatives for DEIS <ul style="list-style-type: none"> ▫ Supplemental w/BRT & incr. bus ▫ Supplemental w/LRT & incr. bus <p>Value Engineering Study</p> <ul style="list-style-type: none"> • 13 Highway ideas • 3 Transit ideas • 5 River crossing ideas <ul style="list-style-type: none"> ▫ Transit inside a segmental box girder (2-bridge concept) | <p>Recommendation of Locally Preferred Alternative (TF)</p> <p>DEIS (05/02/08) (95' v.c.)</p> <ul style="list-style-type: none"> • No build • Replacement w/BRT • Replacement w/LRT <ul style="list-style-type: none"> ▫ Upstream or ▫ Downstream ▫ 3 Bridges (HCT/SB/NB) or ▫ 2 Bridges (STHB) ▫ 08/10/12 Lanes • Supplemental w/BRT & incr. bus • Supplemental w/LRT & incr. bus <ul style="list-style-type: none"> ▫ Downstream ▫ Seismic retrofit existing (for NB) ▫ New HCT/SB bridge ▫ 8 Lanes ▫ All transit options (BRT & LRT) had 4 possible segments <ul style="list-style-type: none"> · Lincoln via Main Street · Lincoln via I-5 · Mill District · Clark College <p>Endorsement of Locally Preferred Alternative 06/24/08 (COV, COP, CTRAN, TriMet, SWRTC, Metro)</p> <ul style="list-style-type: none"> • Replacement w/LRT <ul style="list-style-type: none"> ▫ Downstream ▫ 2 Bridge (STHB) ▫ 10 Lanes ▫ Clark College M.O.S. ▫ Rebuild MD/HI/14/MP/4P/500 ▫ Replace I-5 NPH Bridge • Cost: \$3.1B to \$4.2B <p>Task Force complete</p> <p>Project Sponsor's Council Established</p> | <p>Recommendation for 2 bridge river crossing (UDAG, PBAC, PSC) 06/05/09</p> <p>Recommendation for mobility council (PSC)</p> <p>10 vs 12 lanes</p> <ul style="list-style-type: none"> • 3 General purpose lanes on river crossing • Up to 3 auxiliary lanes <p>LPA Refinements</p> <ul style="list-style-type: none"> • Design <ul style="list-style-type: none"> ▫ River crossing substructure ▫ Other (unit prices, quantities, etc.) • Highway <ul style="list-style-type: none"> ▫ Phase victory braid ▫ Phase marine drive flyover ▫ Re-use existing I-5 bridge over NPH ▫ Lower profile over Hayden Island ▫ 10 Lane river crossing ▫ Reduce NB lane from SR14 to SR500 ▫ Phase SR500 NB ramps • Cost: \$2.6B to \$3.6B (\$3.2 most likely) <p>Open-Web box girder passed by PSC (09/04/09)</p> |

| 2010 | 2011 | 2012 | 2013 | 2014 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--|---|---|---------------|------------------|-----------------|-----------------------------|-------|----|---|-------|-----|---------------------------------|----------------|-----|---------------------------|------|-----|-----------------------------|--------|-----|---------------------------------|-------|--------------|----------------------------|-------|----|------------------------------|--------|-----|----------------------------|--|--|--|--------|-----|----------------------------|--------|-----|--------------------------------|--------|-----|--------------------------------------|--------|-----|
| <p>Affirmed P&N and recommendations for next steps (IRP)</p> <p>Recommendation on 10 lanes and refined Hayden Island interchange design (PSC)</p> <p>Selected LRT route in Vancouver (COV, CTRAN)</p> <p>Independent review panel</p> <ul style="list-style-type: none"> • 18 Findings • 30 Recommendations <ul style="list-style-type: none"> ▫ Resolve tech. issues Re: CRC bridge ▫ "Solve" Hayden Island ▫ Finish NEPA related requirements ▫ Reinvalidate public involvement process ▫ Establish a governance structure ▫ Consider phasing plan for project delivery <p>Hayden Island Design Group</p> <ul style="list-style-type: none"> • On island I-5 interchange • Off island I-5 access (via Marine Dr) • IPS recommended Concept D <ul style="list-style-type: none"> ▫ On island I-5 I/C ▫ Arterial between MD & HI (shared LRT Br) <p>PSC re-confirms 10 lane br. w/full shoulders (09/09/10)</p> <p>Bridge Review Panel</p> <ul style="list-style-type: none"> • 6 Recommendations <ul style="list-style-type: none"> ▫ Discontinue work on open-web box ▫ Select a new bridge type <ul style="list-style-type: none"> · Cable stay · Arch · Deck truss ▫ Public process to select bridge type ▫ Work w/FAA to allow cable stay/arch ▫ Develop a tangent alignment for cable stay/arch ▫ Replace I-5 NPH bridge (Final report 02/03/11) <p>Vancouver working group selects Vancouver LRT align</p> <ul style="list-style-type: none"> • Couplet (Washington/Broadway) • 17th Street (under I-5 @ McLoughlin) • PNR @ Clark College/Mill District/SR 14 | <p>Biological opinion (01/19/11)</p> <ul style="list-style-type: none"> • Established in-water work window <ul style="list-style-type: none"> ▫ Impact pile driving 09/15 - 04/15 ▫ Debris removal 11/01 - 02/28 ▫ Pile driving only for temp work bridge ▫ Piles shall be vibed/oscillated if possible ▫ Pile driving requires bubble curtain • CRC recommended a bubble curtain test project in the Columbia River <p>OR/WA governors select deck truss CR bridge</p> <p>FEIS (09/23/11)</p> <ul style="list-style-type: none"> • LPA w/refinements • MD to victory braid, MD to NB flyover and SR 500 North ramp analyzed but not part of LPA phase 1 • River crossing type: Deck truss • Cost: \$3.1B to \$3.5B <p>ROD (12/07/11)</p> <p>Columbia River bridge temporary test pile program</p> <ul style="list-style-type: none"> • Confined and unconfined bubble curtain • 6 Total piles (3 - 24"/3 - 48") (Contract 8078) | <p>Drilled shaft and driven pile program</p> <ul style="list-style-type: none"> • O-Cell tests on 3 shafts to determine capacity • 3 Shafts <ul style="list-style-type: none"> ▫ 6' diam x 120' deep ▫ 8' diam x 130' deep ▫ 10' diam x 215' deep • 5 driven pile (24" diam x 140' deep) <p>Project packaging and phasing <i>See table below</i></p> <p>Initial construction package</p> <p>Cost: \$3.2 Billion</p> | <p>General bridge permit issued (USCG)</p> <p>CR bridge height re-eval</p> <ul style="list-style-type: none"> • Evaluated impacts to vessels, env. and design for clearances between 95' and 125' • Selected 116' vertical clearance • NEPA re-eval found no significant impacts <p>Develop procurement docs for CRBA project</p> <ul style="list-style-type: none"> • Request for qualifications • Request for proposals <ul style="list-style-type: none"> ▫ Chapter 1 (w/WSDOT as admin) ▫ Chapter 2 <ul style="list-style-type: none"> · Key docs: Geotech baseline, geotech data <p>WSDOT close-out (07/01/13)</p> <p>ODOT continues to pursue CN</p> <p>USCG general permit (09/27/13)</p> <p>CRC first phase</p> <ul style="list-style-type: none"> • ICP w/phased WA elements: <ul style="list-style-type: none"> ▫ I-5 NB to Vancouver ▫ I-5 over McLoughlin ▫ Community connector • Cost +/- \$2.8 Billion | <p>Tolling investment grade analysis report</p> <p>ODOT close-out (05/2014)</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Proposed Packaging Summary</p> <table border="1"> <thead> <tr> <th>Package Title</th> <th>Procuring Agency</th> <th>Delivery Method</th> </tr> </thead> <tbody> <tr> <td>River Crossing (RC) Package</td> <td>WSDOT</td> <td>DB</td> </tr> <tr> <td>Columbia River Interstate Bridge Removal (BR) Package</td> <td>WSDOT</td> <td>DBB</td> </tr> <tr> <td>Mainland Connector (MC) Package</td> <td>ODOT or TriMet</td> <td>DBB</td> </tr> <tr> <td>Marine Drive (MD) Package</td> <td>ODOT</td> <td>DBB</td> </tr> <tr> <td>Oregon Transit (OT) Package</td> <td>TriMet</td> <td>DBB</td> </tr> <tr> <td>Washington Transit (WT) Package</td> <td>WSDOT</td> <td>DBB or GC/CM</td> </tr> <tr> <td>Park-and-Ride (PR) Package</td> <td>WSDOT</td> <td>DB</td> </tr> <tr> <td>Transit Systems (TS) Package</td> <td>TriMet</td> <td>DFI</td> </tr> <tr> <td>Transit Other (TO) Package</td> <td></td> <td></td> </tr> <tr> <td>Ruby Junction Maintenance Facility Modifications</td> <td>TriMet</td> <td>DBB</td> </tr> <tr> <td>Steel Bridge Modifications</td> <td>TriMet</td> <td>DBB</td> </tr> <tr> <td>Light Rail Vehicle Procurement</td> <td>TriMet</td> <td>DFI</td> </tr> <tr> <td>Command Center Upgrades/Modification</td> <td>TriMet</td> <td>DFI</td> </tr> </tbody> </table> | | | | | Package Title | Procuring Agency | Delivery Method | River Crossing (RC) Package | WSDOT | DB | Columbia River Interstate Bridge Removal (BR) Package | WSDOT | DBB | Mainland Connector (MC) Package | ODOT or TriMet | DBB | Marine Drive (MD) Package | ODOT | DBB | Oregon Transit (OT) Package | TriMet | DBB | Washington Transit (WT) Package | WSDOT | DBB or GC/CM | Park-and-Ride (PR) Package | WSDOT | DB | Transit Systems (TS) Package | TriMet | DFI | Transit Other (TO) Package | | | Ruby Junction Maintenance Facility Modifications | TriMet | DBB | Steel Bridge Modifications | TriMet | DBB | Light Rail Vehicle Procurement | TriMet | DFI | Command Center Upgrades/Modification | TriMet | DFI |
| Package Title | Procuring Agency | Delivery Method | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| River Crossing (RC) Package | WSDOT | DB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Columbia River Interstate Bridge Removal (BR) Package | WSDOT | DBB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mainland Connector (MC) Package | ODOT or TriMet | DBB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Marine Drive (MD) Package | ODOT | DBB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Oregon Transit (OT) Package | TriMet | DBB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Washington Transit (WT) Package | WSDOT | DBB or GC/CM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Park-and-Ride (PR) Package | WSDOT | DB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Steel Bridge Modifications | TriMet | DBB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Light Rail Vehicle Procurement | TriMet | DFI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Command Center Upgrades/Modification | TriMet | DFI | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Preparation for Development of a Megaproject

The project partners recognized from the outset that the CRC project would be a “megaproject” likely to encounter some of the challenges faced by other megaprojects in the United States. The team conducted a national review for lessons learned and best practices in delivering large programs, looking at ten projects across six states, including projects such as the Central Artery/Tunnel Project in Boston, Denver’s “T-Rex” Transportation Expansion Program that included both interstate highway widening and light rail extensions, Salt Lake City’s I-15 Design-Build project and Los Angeles’ TCA Toll Road Operations.

Examples of the lessons learned from this review that were applied to the CRC project development process include:

- Creation of a co-located project office with strong agency leadership and an integrated consultant team
- Early and frequent coordination with partner agencies, tribal governments, regulatory agencies
- A rigorous cost estimation process accounting for risk and unknowns with regular updates
- Ongoing, thorough, and professionally facilitated public involvement.

Project Development and the National Environmental Policy Act

The National Environmental Policy Act (NEPA) applies to any major project, whether on a federal, state, or local level, that involves:

- federal funding;
- work performed by the federal government; or
- permits issued by a federal agency.

The NEPA process is the foundational regulatory approval that allows Federal agencies to issue permits and enter into funding agreements for the project. The NEPA process looks broadly at impacts, considering the natural environment, the built environment, and social and economic impacts. The process is interrelated with alternatives development and conceptual design/preliminary engineering. As summarized in the CRC FEIS, the NEPA environmental document:

1. describes project alternatives along with their impacts in the context of the existing conditions and foreseeable future conditions;
2. describes the locally preferred alternative (LPA) identified by local and regional sponsoring agencies and the process used to adopt the LPA;
3. provides transportation, community, and environmental information to assist the public and decision makers;
4. identifies proposed mitigation measures that would reduce or eliminate impacts; and
5. assesses project costs, institutional issues, and potential revenue options.

Preparation of the environmental documents requires extensive, multidisciplinary research and analysis. The environmental process requires review by affected agencies and the public, and substantive responses to comments. As part of the environmental process, alternatives that could avoid impacts to Federally protected natural and historic resources are considered

evaluated, and a determination is made as to whether such alternatives are prudent and feasible. The environmental process also requires consideration of measures to minimize harm to these resources, and evaluates whether these measures are reasonable. The process culminates in a Record of Decision by the lead Federal agencies, which indicates that the environmental review has been satisfactorily completed and complies with NEPA and other applicable law, and identifies mitigation measures and other conditions of approval of the project.

Alternatives Development

Alternatives Development is the process of identifying candidate project components, performing analysis sufficient to inform an evaluation that screens out flawed or less promising components, and advancing the conceptual design and analysis of more promising components, ultimately leading to the selection of a preferred alternative.

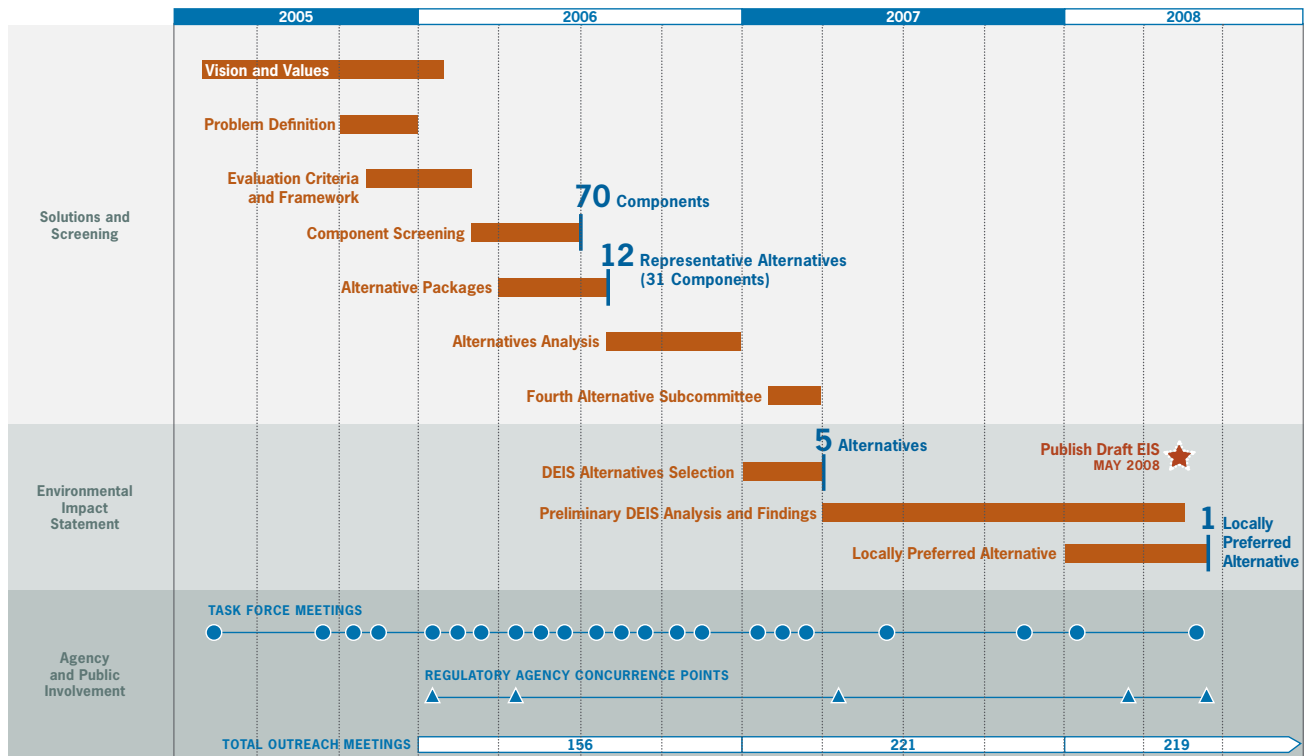
Framing the Problem and Establishing Evaluation Criteria

Prior project planning framed the problems to be addressed and the criteria to be used in evaluating possible solutions, first in the long-range planning processes described in Section 2, and then through the development of a Vision and Values statement and a statement of Purpose and Need for the CRC Project. Throughout the alternatives development process, the Vision and Values and Purpose and Need formed the basis of criteria that were used to evaluate options, guide decisions about which options should proceed for further analysis, and inform the selection and refinement of alternatives. Evaluation activities were conducted by project staff, agency stakeholders and with guidance and feedback from the public to determine which ideas were most likely and best suited to address the problems identified.

CRC Project Components and Screening

Possible CRC Project components were identified through:

- Review of the Portland/Vancouver I-5 Trade & Transportation Partnership Task Force Strategic Plan;
- Review of TriMet's South/North Corridor EIS;
- Public meetings;
- Consultation with the Interstate Collaborative Environmental Process (InterCEP) agency participants; and
- Public comments submitted via web, email or mail.



Early alternative screening timeline

Candidate project components included:

- 23 river crossing component options, ranging from various locations and heights for a replacement bridge, supplemental bridge options, a tunnel option, and new corridor options;
- 14 transit component options, including a range of bus, rail and ferry modes;
- 6 pedestrian component options;
- 6 bicycle component options;
- 5 freight component options; and
- 18 Transportation Demand Management (TDM)/Transportation System Management(TSM) component options.

The components that were analyzed are identified on the following pages.

River Crossing Components

- RC-1: Replacement Bridge-Downstream/Low-level/
Movable
- RC-2: Replacement Bridge-Upstream/Low-level/
Movable
- RC-3: Replacement Bridge-Downstream/Mid-level**
- RC-4: Replacement Bridge-Upstream/Mid-level**
- RC-5: Replacement Bridge-Downstream/High-level
- RC-6: Replacement Bridge-Upstream/High-level
- RC-7: Supplemental Bridge-Downstream/Low-level/
Movable
- RC-8: Supplemental Bridge-Upstream/Low-level/
Movable
- RC-9: Supplemental Bridge-Downstream/Mid-level**
- RC-10: Supplemental Bridge-Upstream/Mid-level
- RC-11: Supplemental Bridge-Downstream/High-level
- RC-12: Supplemental Bridge-Upstream/High-level
- RC-13: Tunnel to supplement I-5
- RC-14: New Corridor Crossing
- RC-15: New Corridor Crossing plus widen existing I-5
Bridges
- RC-16: New Western Highway (I-605)
- RC-17: New Eastern Columbia River Crossing
- RC-18: I-205 Improvements
- RC-19: Arterial Crossing to supplement I-5
- RC-20: Replacement Tunnel
- RC-21: 33rd Avenue Crossing
- RC-22: Non-Freeway Multimodal Columbia River
Crossing
- RC-23: Arterial Crossing with I-5 Improvements**

Bold items were included in the twelve representative alternative packages.

Transit Components

- TR-1: Express Bus in General Purpose Lanes**
- TR-2: Express Bus in Managed Lanes**
- TR-3: Bus Rapid Transit (BRT)-Lite**
- TR-4: Bus Rapid Transit (BRT)-Full**
- TR-5: Light Rail Transit (LRT)**
- TR-6: Streetcar
- TR-7: High Speed Rail
- TR-8: Ferry Service
- TR-9: Monorail System
- TR-10: Magnetic Levitation (MagLev) Railway
- TR-11: Commuter Rail Transit
- TR-12: Heavy Rail Transit
- TR-13: Personal Rapid Transit (PRT)
- TR-14: People Mover/Automated Guideway
Transit

Pedestrian Components

- P-1 Enhance Existing Pathway**
- P-2 New I-5 Bridge and Pathway**
- P-3 New I-5 Pathway-Only Bridge
- P-4 Enhanced Vancouver Connectivity**
- P-5 Enhanced Hayden Island Connectivity**
- P-6 New North Portland Pathway**

Bicycle Components

- B-1 Enhance Existing Pathway**
- B-2 New I-5 Bridge and Pathway**
- B-3 New I-5 Pathway-Only Bridge
- B-4 Enhanced Vancouver Connectivity**
- B-5 Enhanced Hayden Is. Connectivity**
- B-6 New North Portland Pathway**

Freight Components

- F-1 I-5 Mainline Freight-Only Lanes
- F-2 Ramp Freight Bypass Lanes**
- F-3 Truck Freight Restrictions
- F-4 Allow Increased Freight Truck Size and Weight
- F-5 Freight Direct Access Ramps**

TDM/TSM Components

- TM-1 Create Northern I-5 Managed Lane through Restriping
- TM-2 Create Northern I-5 Transit-Only Lane through Restriping
- TM-3 Create I-5 Managed Lane within the Bridge Influence Area
- TM-4 Create I-5 Transit-Only Lane within the Bridge Influence Area
- TM-5 Reversible Express Managed Lane
- TM-6 Direct Access Ramps
- TM-7 Preferential Managed Lane Merge(s)
- TM-8 Ramp Queue Jump Lanes**
- TM-9 Increased Bus Service**
- TM-10 Enhanced Park-and-Ride Capacity**
- TM-11 Enhance ITS Technology and Management Systems**
- TM-12 Improve the Package of Employer and Governmental TDM Policy Measures**
- TM-13 Reduce Passenger Travel Time on Interstate MAX**
- TM-14 Transit Priority Signal System**
- TM-15 Congestion Pricing on I-5**
- TM-16 Highway On-Ramp Metering**
- TM-17 Arterial Managed Lanes
- TM-18 Ramp Terminal Improvements**

Bold items were included in the twelve representative alternative packages.

Components were screened in a two-step screening process. In Step A, transportation components were screened against six pass/fail questions derived directly from the Problem Definition. To determine if each component offered an improvement, components were compared to a “No Build” condition which included transportation improvements adopted in the regional transportation plans, but no additional improvements at the Columbia River crossing.

In Step A, only the transit and river crossing components were screened. This screening merely determined whether or not an idea had the potential to make a positive impact on the problems identified; there was no measurement of ideas against each other. Components in the Pedestrian, Bike, Freight, Roadways, and TDM/TSM categories were not evaluated because their performance would critically depend upon how they were integrated with promising transit and/or river crossing improvements.

In Step B component screening, the transit and river crossing components that passed through the Step A screening process were evaluated further against Step B performance measures identified in the Project Evaluation Framework, which directly reflect the values adopted in the CRC Task Force’s Vision and Values Statement.

For analysis purposes, the Step B measures were grouped into 10 categories relating to distinct community values. These categories were:

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

Measures in categories 8 through 10 (Costs, Growth Management, Constructability) were not considered in Step B screening of components, and instead were assessed during alternatives package screening and/or alternative evaluation, because these components are best evaluated as part of package of components.

Alternatives Package Development and Screening

The early screening efforts identified several promising options for further study. The best-performing river crossing options at that time were a replacement bridge, and a supplemental arterial or Interstate bridge. Express Bus, Bus Rapid Transit (BRT), and Light Rail Transit (LRT) were the best performing transit modes. These components were packaged into twelve representative alternative packages. The packages were structured to assess performance as a package, and also to identify how individual features would perform in different combinations. Each alternative package included a river crossing type and transit mode(s), as well as specific designs to improve safety, freight movement, highway operations, and bicycle and pedestrian access. The twelve alternatives are listed below:

Transit Modes Evaluated in the CRC Environmental Process

Express Bus: bus transit service that makes a limited number of stops, traveling “express” for long distances.

Bus Rapid Transit: Bus transit service that operates primarily in dedicated transit lanes, offers faster travel times than local bus service and offers more passenger amenities at stations than traditional bus service.

Light Rail Transit: Transit service provided in rail cars that can carry a high volume of passengers per trip, and that have the flexibility operate at high speeds in a dedicated right-of-way or at lower speeds on city streets.

| | Alternative Package Themes | River Crossing Type | High Capacity Transit Mode | Function of Existing Bridges | Function of New Bridge |
|-----|---|-------------------------|----------------------------|------------------------------|------------------------|
| #1 | No Action | Existing bridges | None | I-5 | N/A |
| #2 | Minimum Investment: TDM/TSM Emphasis | Existing bridges | None | I-5 | N/A |
| #3 | Maximum Transit Ridership, Minimum I-5 Improvements | Supplemental arterial | LRT | I-5 | Arterial + LRT |
| #4 | Balanced Transit/Highway Improvements with LRT | Supplemental Interstate | LRT | Arterial + LRT | I-5 |
| #5 | Balanced Transit/Highway Improvements with BRT-Full | Supplemental Interstate | BRT-Full | Arterial + BRT | I-5 |
| #6 | Balanced Transit/Highway Improvements with BRT-Lite | Supplemental Interstate | BRT-Lite | Arterial + BRT | I-5 |
| #7 | Maximum Vehicle Capacity | Supplemental Interstate | None | Arterial | I-5 |
| #8 | Balanced Transit/Highway Improvements with LRT | Replacement Bridge | LRT | N/A | I-5 & LRT |
| #9 | Balanced Transit/Highway Improvements with LRT | Replacement Bridge | LRT | N/A | I-5 & LRT |
| #10 | Balanced Transit/Highway Improvements with BRT-Full | Replacement Bridge | BRT-Full | N/A | I-5 & BRT |
| #11 | Balanced Transit/Highway Improvements with BRT-Lite | Replacement Bridge | BRT-Lite | N/A | I-5 & BRT |
| #12 | Maximum Vehicle Capacity | Replacement Bridge | None | N/A | I-5 |

Notes: BRT-full is Bus Rapid Transit with mostly exclusive right of way, BRT-lite is less capital-intensive with much less exclusive right of way.

The CRC Project team used the criteria outlined in the Evaluation Framework (measures of performance in each of the ten categories listed above in the summary of Step B Component Screening) to assess the performance of each alternative. This assessment focused on the performance of river crossing types and transit modes.

Overall, multi-modal packages performed best as measured across the ten evaluation categories. Alternatives that did not include a combination of both highway and transit improvements did not perform well and therefore were not recommended to be carried into the DEIS. Options that contained only transit improvements without bridge capacity or those with new bridge capacity that did not include transit improvements did not meet the purpose and need established for the project.

The analysis demonstrated that a replacement bridge performed best on nearly all criteria, and that BRT and LRT performed best among the remaining transit options, particularly when paired with complementary Express Bus service. In November 2006, the CRC Project Team recommended to the CRC Task Force that the DEIS evaluate: 1) No Build, 2) Replacement Bridge with BRT and Express Bus, and 3) Replacement Bridge with LRT and Express Bus. The CRC Task Force gave a preliminary recommendation to further develop these alternatives in preparation for DEIS evaluation. The Task Force also recommended that the project team undertake a substantial public involvement effort to gauge public opinion on the staff recommendation.

Selection of the Alternatives to be Included in the Draft Environmental Impact Statement (DEIS)

In January 2007, the CRC Project launched an intensive public involvement effort to present the screening results and receive comments on the CRC Project team recommendation. The public and most agencies generally agreed with the recommendation but some, including the Oregon and Washington State Historic Preservation Offices, felt it did not include a wide enough range of options. There was interest in seeing the evaluation results of an alternative that would reuse the existing I-5 bridges. This interest led the Task Force to form a subcommittee in February 2007 to explore how the existing I-5 bridges could be reused and still meet the project's Purpose and Need.

The subcommittee and the project staff found that the best option for reusing the existing bridges would be to place northbound I-5 traffic and bicycles and pedestrians on the existing bridges and include High Capacity Transit (HCT) and southbound I-5 traffic on a new supplemental crossing. The Task Force adopted the subcommittee's recommendation in March 2007.

Data Collection, Traffic Analysis & Modeling

Evaluation of the alternatives was supported by *traffic modeling and analysis* to provide insight into existing travel patterns and estimates of the travel time benefits of the alternatives for various users of the highway. The CRC project development process included an independent review of the traffic modeling methodology used to provide this critical information, as discussed below in the External Review and Validation subsection. For a renewed bridge project, new data collection to update existing conditions and verify that forecasts and travel patterns under current conditions would be similar to those at the time of prior study would be necessary to meet the requirements of NEPA.

The CRC Project team incorporated the March 2007 Task Force recommendation by including two additional alternatives. Both alternatives would have carried I-5 traffic as specified by the Task Force recommendation (southbound traffic on the new supplemental crossing and northbound traffic on both existing I-5 bridges), but differed in their HCT mode; the fourth alternative included BRT on the new supplemental bridge and the fifth alternative included LRT. These adjustments resulted in the following alternatives for evaluation in the *DEIS*:

- 1. No Build:** This alternative included the same 2030 population and employment projections and the same reasonably foreseeable projects used in the build alternatives outside the project area.
- 2. Replacement Bridge with BRT:** This alternative would have replaced the existing I-5 bridges with a new crossing either upstream or downstream of the current I-5 alignment. This new crossing was to carry Interstate traffic, BRT, and bicycles and pedestrians. Transit in this alternative was to include an all-day BRT system that would operate in an exclusive guideway from Vancouver to the Expo Center station, connecting to the existing Yellow Line MAX LRT. Express Bus service and local and feeder bus service would have been increased to serve the added transit capacity.
- 3. Replacement Bridge with LRT:** This alternative was the same as the Replacement Bridge with BRT, but substituted LRT as the High Capacity Transit (HCT) mode. This alternative proposed extending the Yellow Line MAX from it is Exposition Center terminus to Vancouver, eliminating the need for a transfer for those transit patrons with origins or destinations served by MAX. The proposed LRT alignment and station location options and requirements were similar to those assumed for the BRT alternative. As with the BRT alternatives, Express Bus service and local and feeder bus service would have been increased to serve the added transit capacity of LRT alternatives.
- 4. Supplemental Bridge with BRT:** This alternative proposed to use both existing I-5 bridges for northbound Interstate traffic and bicycles and pedestrians, while constructing a new crossing to serve southbound Interstate traffic and BRT in both directions. The existing I-5 bridges were to be re-striped to provide two lanes on each bridge and allow for an outside safety shoulder for disabled vehicles. Three lanes were proposed for through traffic and one auxiliary lane was proposed. Four southbound I-5 lanes and BRT in both directions were to be provided on a new, downstream supplemental bridge. The southbound highway was to provide three through lanes and one auxiliary lane. Interchanges were to be modified to improve intersection performance in accordance with operational analysis that balances the mainline improvements. Express Bus service and local and feeder bus service were to be increased to serve the added transit capacity.
- 5. Supplemental Bridge with LRT:** This alternative proposed the same elements as the Supplemental Bridge with BRT, but substituting LRT for BRT as the HCT mode.



Selection of the Locally Preferred Alternative

The FTA requires the adoption of a Locally Preferred Alternative (LPA) by state and/or local project sponsors, and FHWA project planning and environmental guidance encourages a similar approach. The CRC LPA was selected based on the technical analysis presented in the DEIS, input from the CRC Task Force, DEIS comments, and local project partner input. Notably, the CRC Task Force voted 37-2 to *adopt the LPA*, which was also endorsed by WSDOT and ODOT and the six local project partners (C-TRAN, TriMet, Southwest Washington Regional Transportation Council, City of Vancouver and City of Portland).

The LPA featured:

- The new river crossing over the Columbia River and the 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.
- Extension of light rail from the Expo Center in Portland to Clark College in Vancouver, and associated transit improvements, including transit stations, park and rides, bus route changes, and expansion of a light rail transit maintenance facility.
- Bicycle and pedestrian improvements throughout the project corridor.
- A toll on motorists using the river crossing.
- Transportation demand and system management measures to be implemented with the project.

The FEIS evaluated the potential for phasing construction. The FEIS identified the potentially phased elements, and referred to the initial investment as the “LPA with highway phasing.” The LPA with highway phasing option

Transit Mode Analysis & Findings

The analysis of transit mode forecasted that LRT would attract and accommodate more riders than BRT. This finding was influenced by the integration of LRT into the existing light rail network in the region which would have provided greater connectivity. At the time, the existing light rail network was approximately 52 miles long. Since BRT would follow the same alignment and end at the Expo Center in Portland, projected ridership was lower due to the transfer to LRT required at Expo for trips with destinations beyond the BRT line.

Some traffic effects for city streets were found for both LRT and BRT based on different operating characteristics. LRT vehicles were planned to preempt signals, meaning cross-traffic gets a red light as a light rail vehicle approaches an intersection to cross. For BRT, due to the number of vehicles needed to meet ridership demand, signal preemption was not included. The higher number of BRT vehicles had the potential to create some congestion due to bus bunching.

These two modes had different capital and operating and maintenance costs. The analysis showed that LRT was more capital-intensive (higher cost) than BRT. Although the BRT system would have required the purchase of more transit vehicles than light rail, the additional expense of constructing the light rail guideway was anticipated to require 22 percent more capital cost.

BRT was more operation-intensive than LRT, requiring more vehicle trips and higher operations and maintenance costs to serve the demand for transit service (because each BRT vehicle accommodates fewer riders than a light rail train). The lower number of vehicles required for light rail meant that annual operating and maintenance costs for light rail were expected to be \$1.8 million less than BRT.

For the CRC project, most transit capital costs were anticipated to be covered by FTA New Starts funds. Operation and maintenance costs were estimated and the transit districts had to demonstrate how these would be addressed over time.

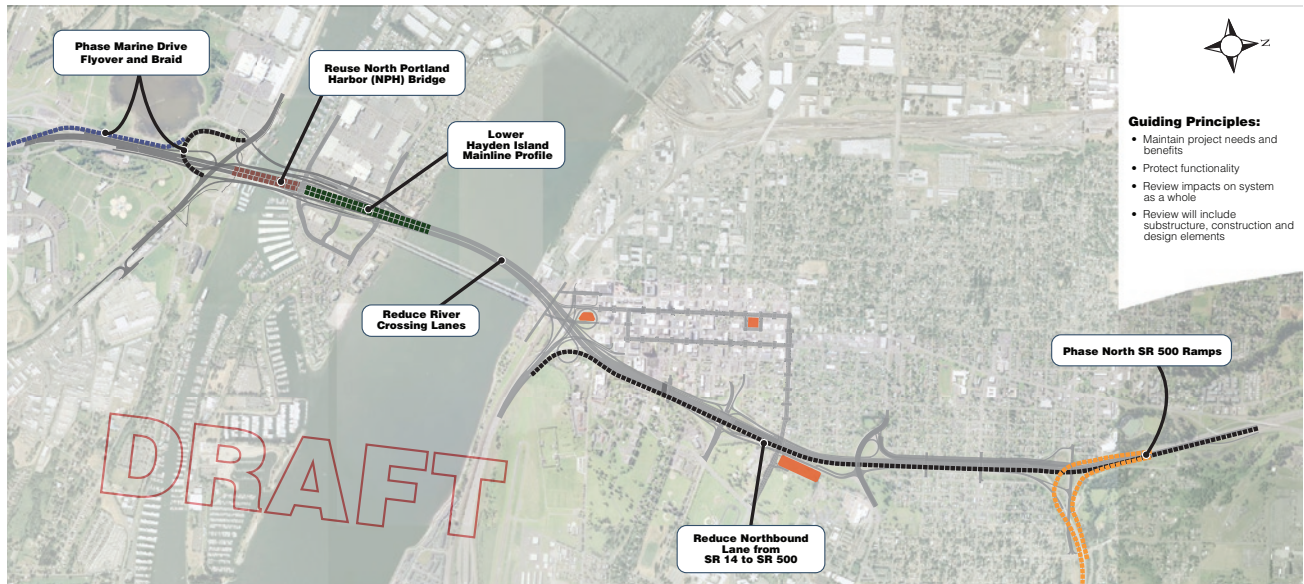
would have built most of the LPA in the first phase, but would have deferred construction of specific elements of the project, including:

- Construction of the I-5 braided on- and off-ramps at Victory Boulevard.
- Construction of the Marine Drive interchange flyover.
- Construction of the northern half of the I-5/SR 500 interchange.

Several local agencies identified conditions of their support for the LPA; moving forward into the Final Environmental Impact Study (FEIS), there were 129 such conditions to be addressed by the CRC Project team. Much of the concept design and stakeholder coordination effort that was conducted between the DEIS and FEIS milestones focused on refining the LPA to address these resolutions.

Some highlights of the local agency of the issues that local agencies emphasized in their LPA resolutions include:

- The city of Portland called for world-class pedestrian and bicycle facilities, including detailed recommendations for the Hayden Island Marine Drive interchanges.
- The city of Vancouver emphasized the need to create “human-scale environments that provide transportation mobility and accessibility for the entire range of travel modes” and included detailed recommendations for the design at Evergreen Boulevard, Main Street Extension, Columbia Way at the north river bank, the Land bridge connection to Main Street, the 5th Street pathway to the Reserve, and the 7th Street Heritage Bridge C Street connection to the West Vancouver Barracks.



Columbia River CROSSING Local Project Partners Oregon Department of Transportation Washington State Department of Transportation US Department of Transportation Federal Transit Administration Federal Highway Administration City of Vancouver City of Portland SW Washington Regional Transportation Council Metro C-TRAN TriMet

November 2009 Draft Recommendation

- The Metro Council recommended that tolls on the existing I-5 bridges be designed to reduce congestion by managing travel demand.

Refinements to the Locally Preferred Alternative

Refinements of components continued after adoption of the LPA to reduce project costs, address impacts and improve performance. These refinements were addressed in the Final EIS or in subsequent NEPA Reevaluation documents. In June 2009, the *Project Sponsors Council* requested that the CRC Project refine the project designs for the LPA to identify cost savings while maintaining the environmental, economic, traffic and safety benefits identified in the LPA. The project team recommended several refinement options which cumulatively offered a \$650 million cost reduction. The recommendations, as shown in the figure below, were:

- Eliminating a dedicated ramp (braid) to access Victory Boulevard from I-5 southbound;
- Eliminating an elevated ramp (flyover) across I-5 as part of the Marine Drive interchange;
- Reusing the existing highway bridge over North Portland Harbor;
- Eliminating elevated structures over Hayden Island and lowering the profile of the interstate;
- Reducing the width of the I-5 bridge to accommodate 10 traffic lanes instead of 12;
- Removing one planned highway lane between SR 14 and SR 500; and
- Eliminating the ramps to I-5 northbound from SR 500 and from I-5 southbound to SR 500.

In February 2010, the governors of Oregon and Washington directed project staff to continue design work using the recommended refinements to reduce the project cost. As a result of the cost-saving analysis and decisions on bridge design, estimates of the most likely cost of construction were reduced to \$3.2 billion, within a range of \$2.6 to \$3.6 billion. Previous estimates had been within a range of \$3.1 - \$4.2 billion.

CRC Project Record of Decision

In December 2011, the FHWA and FTA jointly issued a *Record of Decision* (ROD) finding that the requirements of the National Environmental Policy Act (NEPA) had been satisfied for the construction and operation of the Selected Alternative of the CRC Project. (“Selected Alternative” is the term used in the ROD to describe the Locally Preferred Alternative, with any refinements incorporated at the time of the ROD.)

The ROD documented federal approval of:

- Project purpose and need
- Technical work
- Process used to select the Locally Preferred Alternative
- Locally Preferred Alternative:
 - Replacement I-5 shared transit-highway bridge
 - Three through lanes and two auxiliary lanes in each direction
 - Light rail transit extension to Clark College in Vancouver
 - Highway and pedestrian and bicycle improvements
- Mitigation for unavoidable impacts
- Conclusion of the NEPA process

The ROD also provided findings on other environmentally-related federal statutory requirements. The ROD described the highway and transit features that were to be included in the project, identified mitigation commitments, and incorporated the NMFS Biological Opinion and the National Parks Service Section 106 Memorandum of Agreement. FHWA and FTA signature on the Record of Decision finalized the environmental review process and formally identified the federal agencies’ selected alternative for the CRC—a replacement Interstate 5 bridge with light rail—and allowed final design and construction planning to proceed.

Integrated Environmental Review and Analysis

Preparation of required environmental documents requires extensive, multidisciplinary research and analysis. The environmental review completed during prior project planning summarized existing conditions, impacts, and potential mitigation measures for the following disciplines and areas of possible impacts:

- Transportation
- Aviation and Navigation
- Property Acquisitions and Displacements
- Land Use and Economic Activity
- Neighborhoods and Environmental Justice
- Public Services and Utilities
- Parks and Recreation
- Historic and Archaeological Resources
- Visual and Aesthetic Qualities
- Air Quality
- Noise and Vibration
- Energy
- Electric and Magnetic Fields
- Water Quality and Hydrology
- Wetlands and Jurisdictional Waters
- Ecosystems
- Geology and Soils
- Hazardous Materials
- Cumulative Effects

The Financial Analysis prepared for the FEIS includes an assessment of project costs, institutional issues, and potential revenue options, along with highway and transit financial plan scenarios.

The FEIS also documented the CRC Project analysis to meet the requirements of Section 4(f) of the US Department of Transportation Act. To comply with

Section 4(f), the FEIS described the potential impacts of project alternatives on federally protected historic, park, and recreational resources. The CRC Project evaluated alternatives that could avoid impacts to these resources, including whether such alternatives were prudent and feasible. It considered measures to minimize harm to these resources, and evaluated whether these measures were reasonable.

The FEIS was supported by detailed *technical reports* including:

- Acquisitions Technical Report
- Air Quality Technical Report
- Archaeology Technical Report
- Aviation Technical Report
- CEVP Workshop Final Report
- Cumulative Effects Technical Report
- Economics Technical Report
- Ecosystems Technical Report
- Electromagnetic Fields Technical Report
- Energy Technical Report
- Environmental Justice Technical Report
- Geology and Groundwater Technical Report
- Hazardous Materials Technical Report
- Historic Built Environment Technical Report
- Indirect Effects Technical Report
- Land Use Technical Report
- Navigation Technical Report
- Neighborhoods and Population Technical Report
- Noise and Vibration Technical Report
- Parks and Recreation Technical Report
- Public Services Technical Report
- TDM/TSM Technical Report
- Traffic Technical Report
- Transit Technical Report
- Utilities Technical Report
- Visual and Aesthetics Technical Report
- Water Quality and Hydrology Technical Report

This and other environmental and engineering work supported pursuit of major environmental permits. A list of federal and state permits worked on as part of the CRC project and their status is on pages 100-102.

Interstate and Interagency Collaboration

As discussed in **Section 5: Project Management, Leadership and Coordination**, the CRC lead and participating agencies entered into an *Interstate Collaborative Environmental Process (InterCEP) agreement* to streamline the environmental process element of project development. The parties agreed on shared goals of predictability, through early and on-going coordination and collaboration. The InterCEP process included the participation of both the Oregon and Washington State Historic Preservation Offices and one representative from each of the federal agencies. The parties met quarterly, with additional working group technical meetings, and identified key milestones for comment and for concurrence, including the EIS, the Biological Opinion, the Section 106 Agreement, the Bridge Permit, and the USACE Section 408 Permit. InterCEP was essential for the coordination of comments and input, and in demonstrating to FHWA & FTA that the resource agencies were all being fully consulted. Each of the resource agencies have priorities and stewardship responsibilities; these priorities overlap and may even conflict in some cases. The InterCEP process allowed these issues to be identified and incorporated into a multi-agency negotiation of project features and requirements. InterCEP also helped to streamline the NEPA reevaluation processes associated with refinements to the project.

National Marine Fisheries Service ESA Biological Opinion and Conservation Recommendations

An important step in the NEPA process was the issuance of an Endangered Species Act *biological opinion* and essential fish habitat conservation recommendations by the National Marine Fisheries Service (BO). The BO found that the replacement bridge was not likely to adversely affect salmon, steelhead, sturgeon, eulachon, sea lion or orca, and established an allowable window and other requirements for in-water work required for construction of the bridge.

Section 106 Historic and Archaeological Resources Review

Concurrent with the environmental process, the CRC project completed a review of potential impacts to historic and archaeological resources, resulting in execution of a *Memorandum of Agreement* with state and federal agencies responsible for implementation of Section 106 of the National Historic Preservation Act. Parties to the agreement included the FHWA, FTA, U.S. Army Corps of Engineers (USACE), Washington State Department of Archaeology and Historic Preservation (DAHP), And Oregon State Historic Preservation Office (ORSHP).

This agreement included:

- General requirements and standards to follow in final design and construction of the project;
- Stipulations for the Columbia River (Interstate Bridge northbound) Bridge including requirements such as development of Bridge Marketing Plan for possible re-use of components; Historic American Engineering Record (HAER) photographic documentation requirements and narrative; professionally designed interpretive programs installed on the project site; professionally designed and maintained website; and incorporating decorative or interpretive structural elements such as the historic entry pylons into the design of the project or offering them to local historical societies and museums;
- Similar stipulations for the Pier 99 Building;
- Stipulations for the Vancouver National Historic Reserve Post Hospital including landscaping elements of the community connector [an enhanced connection for pedestrians and bicyclists between downtown Vancouver and Fort Vancouver National Historic Reserve with some landscaping] and a Construction Vibration and Settlement Management and Monitoring Plan;
- Stipulations for the Vancouver National Historic Reserve in its entirety including design and installation of an aesthetically appropriate noise wall extending from the Land Bridge to the southern edge of the Post Hospital and funding a curation facility;
- Mitigation for Light Rail Noise Impacts; and
- Principles and Stipulations for Archeological Investigations:
 - A. Preparation of Archaeological Resources Treatment Plans (Treatment Plan)
 - B. Preparation of an Inadvertent Discovery Plan

-
- C. Additional Mitigation Measures and Public Education
 - D. Tribal Monitoring
 - E. Consultation

USCG Bridge Permit

Throughout project development and environmental planning, the CRC Project worked closely with the USCG and other stakeholders to optimize the design clearance parameters for the I-5 replacement bridges over the Columbia River. The bridge site is vertically constrained by airspace flight envelopes required for the Pearson Airfield and Portland International Airport. As a result of early planning work—which included a public hearing conducted by the USCG in 2006—a minimum clearance of 95 feet above zero stage Columbia River Datum (CRD) was established. In USCG hearing documentation, it was acknowledged that some river users might be adversely impacted by the 95-foot clearance limitation, and in those cases mitigation might be warranted. The 95-foot CRD clearance was used as a minimum design parameter throughout the Environmental Impact Statement (EIS) process, from 2005-2011. The impacts described in the FEIS and the Record of Decision were based on the 95-foot bridge height, and found that most river users and vessels would be able to pass under the proposed mid-level bridges, but three known vessels/users would be adversely impacted, requiring mitigation.

Bridge height was revisited in response to comments from the U.S. Coast Guard bridge administrator for the 13th Coast Guard District that were submitted after the publication of the FEIS, expressing concern about the proposed 95-foot clearance and suggesting a height of 125 feet. This late feedback introduced a significant area of uncertainty to be addressed in the final design and permitting phase. The CRC Project conducted an updated and more detailed survey of river users and vessels, and evaluated options for a mid-level bridge of greater than 95 feet above zero CRD of vertical clearance. The updated information and analysis were conducted to support the development of an application for a USCG General Bridge Permit.

In November 2012, the Project published this updated data and analysis in the Navigation Impact Report (NIR). The NIR provided detailed evaluation of mid-level bridge design refinement options with vertical clearances ranging from 95 to 125 feet above zero CRD. Based on this analysis, and to further reduce navigational impacts, the bridge design was refined with an increased bridge height to allow a vertical clearance in the primary channel of 116 feet above zero CRD. The 116-foot bridge analyzed in the NEPA reevaluation is a variation of the 110-foot option studied in the NIR. The design of the 110-foot option was refined to allow the additional vertical clearance while not adding substantially to the landside impacts or construction costs.

The USCG issued its *general bridge permit* for the CRC Project on September 27, 2013.

Section 6: Project Development

| Permit or Approval | Issuing Agency | Submittal/Status Date | Expiration Date | Review Purpose |
|---|-----------------------------------|--|--|--|
| Federal: | | | | |
| Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act U.S. Army Corps of Engineers (USACE) Permit | USACE Portland District | Not Obtained - Application Submitted 11/30/2012; Public Comment Period Occurred from 2/11/13 -4/15/13 | Up to five years from date of issuance for an individual permit | Permit for effects on wetlands and waters of the US and placement of piers in navigable waters |
| General Bridge Permit-Section 9 of the Rivers and Harbors Act U.S. Coast Guard (USCG) | USCG | Obtained -9/27/2013 | Bridge construction must commence within three years and be completed within five year of permit issuance. | Navigational Clearances |
| Section 408 Modification/ Alteration of Corps of Engineer Levee (USACE) | USACE | Not Obtained - target Fall 2013 | | Comply with FEMA/ USACE flood regulations |
| Section 408 for Navigation | USACE | Not Obtained - target Spring 2013 | | Comply with FEMA/ USACE flood regulations |
| Federal Aviation Administration 7460-1 Permit (FAA) for Permanent Obstruction | FAA | Not Obtained - target Fall 2013 | | Construction Permit for impact to air traffic |
| Endangered Species Act Section 7 Consultation | National Marine Fisheries Service | Obtained 1/19/2011 | Valid as long as the project elements don't change from what was consulted on. If the project means/methods change in a way that could negatively impact listed species, or if new species are listed, it may require reinitiating consultation. | Comply with Endangered Species Act |
| Endangered Species Act Section 7 Consultation | US Fish & Wildlife Service | Obtained 8/27/2010 | Same as above. | Comply with Endangered Species Act |
| Magnuson-Stevenson Fishery Conservation Management Act | National Marine Fisheries Service | Obtained 1/19/2011 | Same as above. | Comply with Magnuson-Stevenson Fishery Conservation Management Act |
| Marine Mammal Protection Act | National Marine Fisheries Service | Not Obtained - target Fall 2014 | An Incidental Harassment Authorization is good for 1 year. A Letter of Authorization is good for 5 years. | Comply with Marine Mammal Protection Act |
| Sole Source Aquifer Protection Act | Environmental Protection Agency | Obtained 7/23/2010 | | Comply with Sole Source Aquifer Protection Act |
| Right of Way Permit (Interstate) Federal Highway Administration | FHWA | Not Obtained - target 2014 | | ROW use authorization |
| Right of Way (Railroad) Federal Railroad Administration | FRA | Not Obtained - target 2014 | | Shared crossing waiver |
| Federal Aviation Administration 7460-1 Permit (FAA) for Construction Obstruction | FAA | TBD by construction contractor | | Construction Permit for impact to air traffic |

Note: The "Expiration Date" column reflects information for permits/approvals that we were easily able to verify with agency contacts and for those that have standard durations.

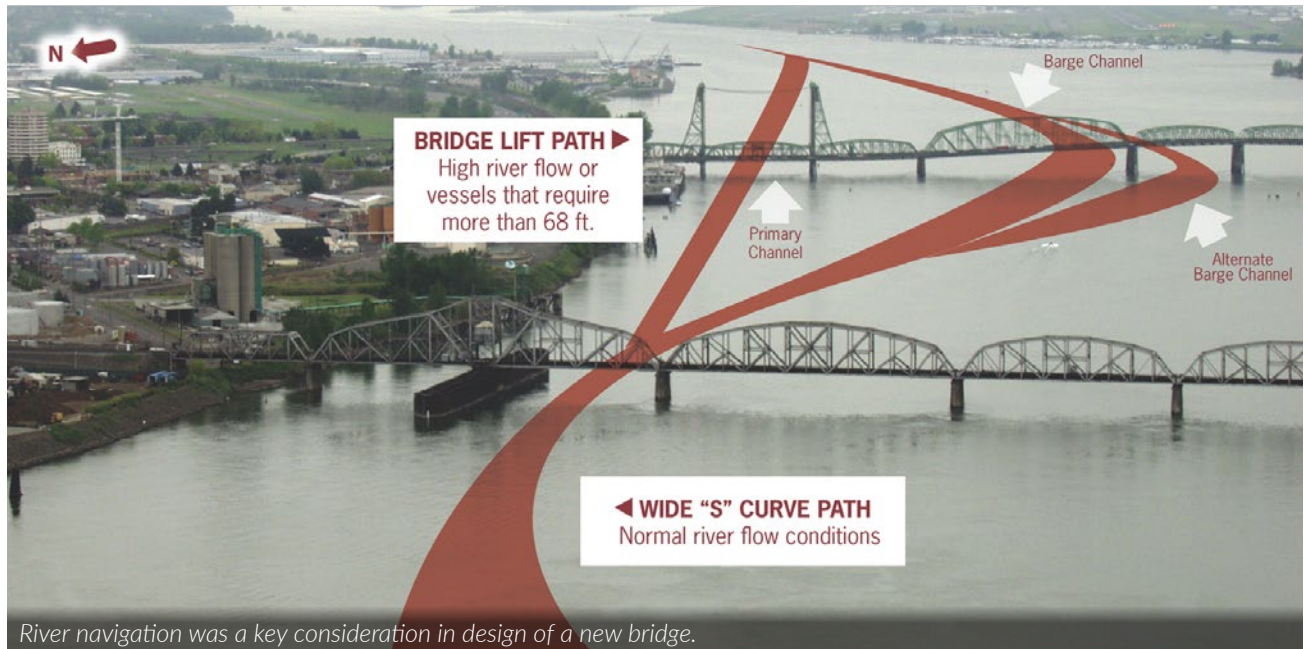
| Permit or Approval | Issuing Agency | Submittal/Status Date | Expiration Date | Review Purpose |
|---|--|---|---|---|
| State: Oregon | | | | |
| Removal & Fill Permit | Oregon Department of State Lands | Withdrawn - Application withdrawn on 5/22/2013 | Up to five years from date of issuance | Environmental Permit |
| Clean Water Act (CWA) Section 401 Water Quality Certification | Oregon Department of Environmental Quality | Obtained -8/30/2013 | 8/30/2023 | Environmental Permit - Water Quality |
| Lease/Bridge Easement Permit | Oregon Department of State Lands | Not Obtained - Target Fall 2013 | | Land Use Permit |
| Oregon Fish Passage Act Approval | Oregon Department of State Lands | Not Obtained - Target Summer 2013 | | In-water structure design approval |
| Archaeological Excavation Permit | ORSHPO | Not Obtained - Target Fall 2013 | | Section 106 |
| 1200-C Construction Stormwater | Oregon Department of Environmental Quality | TBD by construction contractor | Valid until project terminates coverage | Environmental Permit - Water Quality - Soil Erosion |
| Stationary Source Permit | Oregon Department of Environmental Quality | TBD by construction contractor | | Environmental Permit - Air Quality |
| ODOT Rail Crossing | ODOT | Not Obtained - Target 2014 | | ODOT Approval |
| ODOT ROW encroachment - Permit | ODOT | Not Obtained - Target 2014 | | ROW Use |
| Intersection Signals (ODOT - COP) | ODOT | Not Obtained - Target 2014 | | Design Permit |
| ODOT - Interchange Operations | ODOT | Not Obtained - Target 2014 | | Design Permit |
| ODOT - Structures | ODOT | Not Obtained - Target 2014 | | Structural Permit |

Note: The "Expiration Date" column reflects information for permits/approvals that we were easily able to verify with agency contacts and for those that have standard durations.

Section 6: Project Development

| Permit or Approval | Issuing Agency | Submittal/Status Date | Expiration Date | Review Purpose |
|---|--|--|---|--|
| State: Washington | | | | |
| Clean Water Act (CWA) Section 401 Water Quality Certification | Washington Department of Ecology | Obtained 8/30/2013 | 8/30/2023 | Environmental Permit - Water Quality |
| Hydraulic Project Approval | Washington State Department of Fish and Wildlife | Not Obtained Application Submitted 1/7/2013 | Up to five years from date of issuance | Work that uses, diverts, obstructs, or changes the natural flow or bed of any fresh water or saltwater of the state. |
| Shoreline Management Act (SMA) | Implementation is delegated to local government. Following CoV decisions, package is sent to DOE for approval. | Not Obtained - target Fall 2013 | Determined by local government in accordance with RCW 90.58.143 | To regulate developments and uses of water bodies and associated upland areas to protect human health and the environment. |
| Aquatic Lands Lease/Easement Application - WA | Washington State Department of Natural Resources (DNR) | Not Obtained - target Fall 2013 | | Land Use Permit |
| Section 106 Archaeological Treatment Plan | DAHP and other consulting parties | Not Obtained - target Winter 2013 | | Section 106 |
| DNR, Application for Authorization | DNR | Not Obtained - target Winter 2013 | | Review and approve activities on state owned aquatic lands, including archaeological investigations. |
| Construction Stormwater General Permit Washington Department of Ecology (Ecology) | Ecology | Not Obtained - target 2014 | Valid until project terminates coverage | Environmental Permit - Water Quality - Soil Erosion |
| Stationary Source Permit | Ecology | Not Obtained - target 2014 | | Environmental Permit - Air Quality |
| WSDOT - ROW Encroachment Permit | WSDOT | TBD by construction contractor | Valid until revoked | ROW Use |

Note: The "Expiration Date" column reflects information for permits/approvals that we were easily able to verify with agency contacts and for those that have standard durations.



USACE Section 408 Permit

The proposed replacement of the northbound and southbound bridges crossing the main channel of the Columbia River would have impacted waters of the U.S. and modified an existing Federal navigation project, thus requiring a Clean Water Act Section 404 and U.S. Code (USC) Title 33 Section 408 authorization from the U.S. Army Corps of Engineers (USACE). The existing Federal projects (Figure 1-2) that would have been impacted by the CRC Project are:

- The Primary Navigation Channel on the Columbia River, authorized by the Rivers and Harbors Act of August 26, 1937
- The Barge Channel, authorized under Section 107 of the Rivers and Harbors Act of July 14, 1960
- The Vancouver Turning Basin downstream of the I-5 bridge, authorized by the Rivers and Harbors Act of October 23, 1962; and
- The Alternate Barge Channel, authorized by the Water Resources Development Act of August 17, 1999.

Section 408 allows non-Federal modifications to USACE projects only when the modifications will not be injurious to the public interest and will not impair the usefulness of such work. Proposed modifications to the Columbia River navigation channel were to provide continued navigation and minimize impacts to USACE operations and maintenance (O&M), although the navigation channel width was to be reduced during bridge construction activities. A submittal known as a Request for Section 408 Approval of Modification was prepared to comply with USACE requirements and guidance. To develop this submittal, the CRC Project analyzed characteristics of existing and proposed navigation channels with respect to their width, depth, and vertical clearance to demonstrate that a navigation channel could be provided, without requiring dredging of the river.

The CRC Project also analyzed impacts of the proposed North Portland Harbor (NPH) Crossing components of the project on existing dikes and levees.

The proposed NPH Crossing was anticipated to have the following impacts to USACE levees on the south side of the NPH:

- Due to grade requirements, the western most bridge would have required relocation or lowering of an existing flood wall, embankment section, and bank protection,
- Impacts to the Peninsula 2 levee from construction of the two bridges west of the mainline I-5 bridge had not been identified,
- Impacts to the Peninsula 1 and Peninsula 2 levees due to the seismic upgrades to the I-5 bridge had not been identified, and
- Construction of the eastern bridge would have required major modifications to the configuration of the Pen 2 levee at the Pier 99 location. The Marine Drive interchange would have significantly impacted the existing Denver Avenue Cross Dike, and would probably have impacted the Pen 1 levee and potentially impact the interior drainage systems within both Pen 1 and Pen 2.

NEPA Determinations (Reevaluations and Categorical Exclusions)

After the Record of Decision was issued, the project design continued to progress and evolve to address requirements of the USCG and USACE, to address navigation impacts, to identify cost reductions, and to refine the construction phasing and delivery plan. To comply with NEPA, the CRC Project submitted several reevaluations to identify impacts associated with these changes in the project scope and design. Each of these reevaluations was approved by FTA and FHWA as the federal agency owners of the project's environmental process.

Applicability of CRC NEPA Determinations to a New Project

Analysis completed for the CRC FEIS will be useful in subsequent environmental review or reevaluation, as the natural and built environment of the project area are substantially the same as they were when the Record of Decision was issued. However, the extent to which a new project could be informed by prior environmental analysis and/or approvals may depend on factors such as:

- the extent to which a new project is responding to the same statement of Purpose and Need;
- the extent of changes in conditions in the project area;
- the extent of changes in the scope and design of a new project.

At a minimum, a new project will require a reevaluation to comply with NEPA; the FHWA Federal Aid Policy Guide provides that:

*written evaluation of the final EIS will be required before further approvals may be granted if major steps to advance the action (e.g., authority to undertake final design, authority to acquire a significant portion of the right-of-way, or approval of the plans, specifications and estimates) have not occurred **within three years after the approval of the final EIS, final EIS supplement, or the last major Administration approval or grant.***

SSB 5806 expresses an intent to rely on “prior relevant work and prior decisions and approvals.” In developing a renewed Project, the project partners could consider changes to the project Purpose and Need or to the project components. If so, a new project may require a new environmental impact statement, rather than a reevaluation, which would limit the ability to rely on prior decisions and approvals. Early consultation with the FHWA and FTA during the process of considering a renewed Project would aid in assessing of the likely environmental process requirements for a new project. Previously identified impacts will need to be reevaluated, whether through a NEPA reevaluation, Supplemental Environmental Impact Statement, or new Environmental Impact Statement.

Conceptual Design and Preliminary Engineering

The CRC Project Team conducted *conceptual engineering and preliminary engineering* efforts throughout the project timeline to support component identification, alternative development, NEPA, cost estimates and risk assessments, public outreach, environmental permitting, and procurement development. At each phase of the project development process, selected elements of the project were advanced further in their design than may be typical of smaller projects, because the significance of the investment decision required substantial detail to inform decision-making and to provide appropriate levels of certainty about costs, benefits and impacts. Although a new bridge project may introduce new options to be developed, engineering completed previously as part of the CRC Project would be likely to have value to a new project, as there is detailed information available on the cost and performance of the alternatives and on a variety of technical issues discussed in this section that may be applicable to a new bridge project. Among the technical findings from prior project planning that are likely to be applicable to any new bridge project are:

- Drilled shaft tests that confirmed the feasibility of 10-foot diameter shafts drilled to a depth of over 200 feet; this finding greatly reduced project construction risks and allowed for a significant narrowing of the cost estimate range;
- The feasibility of mitigating the environmental impacts of in-water work with “bubble curtain” techniques that limit the impacts of construction vibration on protected species. Validating this method expanded the allowable work window for this schedule-critical work element and further reduced project construction risks;
- The viability of combining highway and transit into a single bridge, reducing project scope and construction cost.
- Identification of a bridge envelope, including height, size and location of the bridge, that satisfied the requirements of the U.S. Coast Guard, U.S. Army Corps of Engineers, and Federal Aviation Administration to maintain navigation pathways, bridge clearances, and clearances of aviation;
- Collection and documentation of extensive geotechnical information on land and in water which allowed completion of baseline report and foundation design reports for bridges; and,
- Identification and evaluation of historic resources and archaeological data, including underground investigation.

Additionally, a host of agency and community stakeholder issues were addressed through concept design and preliminary engineering during prior project planning.

Conceptual design was performed on the components that were identified from previous studies, through public outreach and internal discussions to identify conceptual alignments and profiles. These alignments and layouts were used to initiate public outreach and comments for the river crossing, highway interchanges and transit mode. Sufficient detail

from the engineering was required to provide information that could evaluate each component against the pass/fail questions that were derived from the CRC Problem Statement.

The components that passed the initial screening were packaged into the 12 alternatives measured against the Evaluation Framework. More detail was developed for each alternative package, compared to the component screening, to provide the information needed by the Evaluation Framework. Conceptual alignments and profiles for the transit and highway elements (including interchanges and bridges) were used to identify potential impacts/risks and to develop a preliminary cost estimate for each alternative.

The DEIS process required a significant amount of engineering so that all potential impacts for the build alternatives could be evaluated and documented. Alignments and profiles were advanced to identify potential right of way impacts as well as the amount of cut and fill of land that would be required in culturally sensitive areas. Bridge and geotechnical engineering identified potential locations and sizes for new bridge foundations. Transit and traffic modeling was performed on each alternative to identify performance.

Identification of the Locally Preferred Alternative allowed the engineering effort to focus on one alternative and to advance designs to a greater level of detail. The information developed to reach this milestone was used to consult with regulatory agencies and therefore was very detailed (for example, identifying the number, size and location of in-water shafts). As noted, the Project Sponsors Council requested that the CRC Project team identify refinements to the LPA as cost saving measures that maintained the performance documented in the DEIS; additional modeling and design was performed to develop these cost saving measures.

After the FEIS, engineering was advanced to support the environmental permitting (including the Section 106, 408, USCG Bridge Permit and other elements discussed further below); to address public outreach/comments regarding the Marine Drive and Hayden Island connections; and to support the development of draft procurement documents.

Conceptual Design and Preliminary Engineering— River Crossing

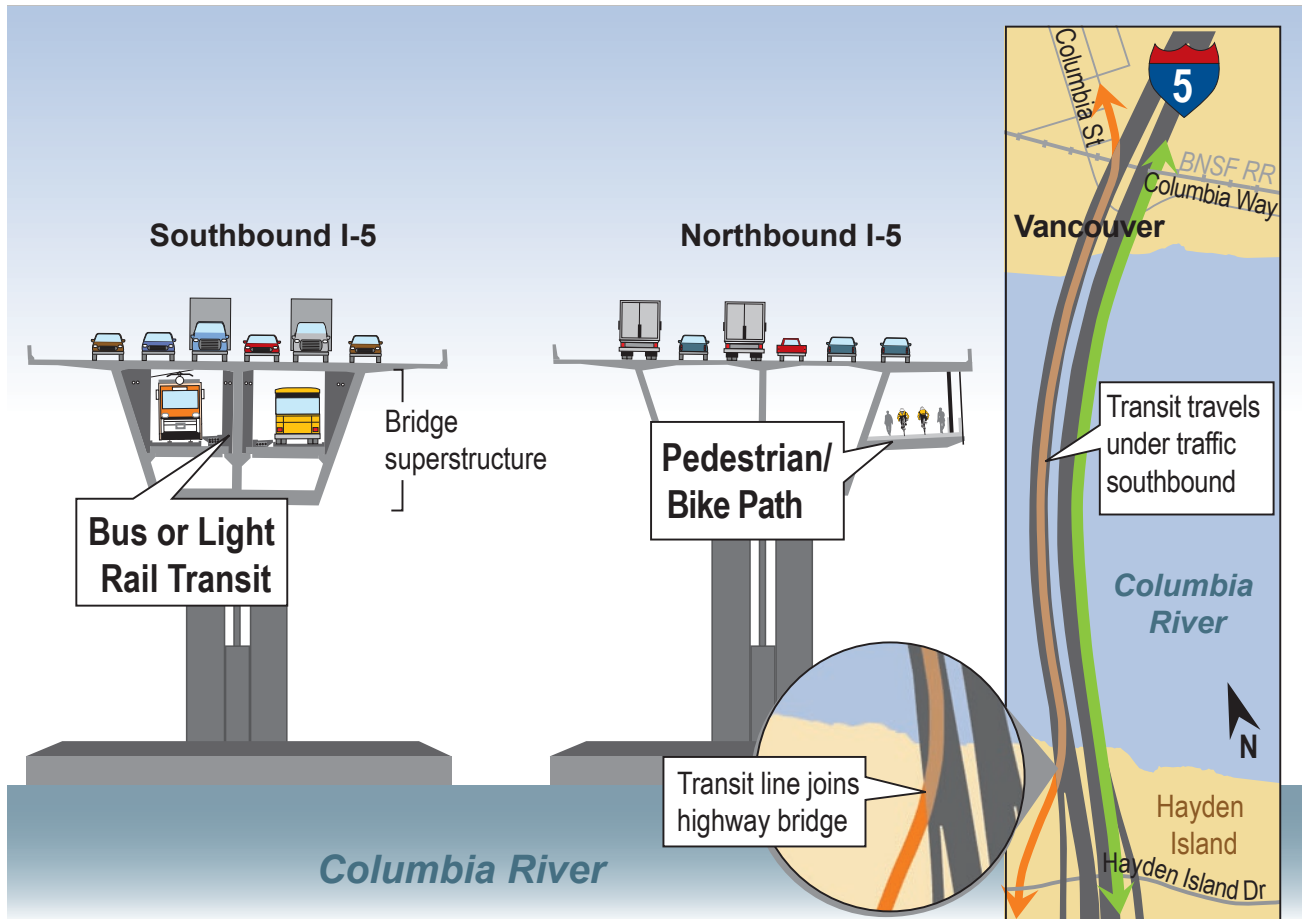
Project development for the CRC included conceptual engineering of the river crossing options to address issues such as alignment, height, and structure type. The bridge design addressed issues such as navigation requirements (ultimately resulting in a U.S. Coast Guard Bridge Permit) and aviation clearances. Conceptual layouts and sections were developed for the 23 components to cross the river including a supplemental bridge, tunnel, replacement bridge, new corridor crossing, and the other river crossing components summarized above in the Alternatives Development subsection.

Concepts to construct seismic upgrades on the existing bridges were developed for the supplemental alternatives to better understand risks and costs. Potential bridge types for the replacement and supplemental bridges were identified including conceptual span lengths and cross sections to support the draft environmental impact statement and traffic modeling.

A value engineering study focused on the river crossing identified a segmental box girder as the most cost-effective bridge type and also developed an idea to share the highway bridge with transit, thereby eliminating the need for a separate structure for transit. (A box girder bridge is a bridge in which the main beams are comprised of girders in the shape of a hollow box.) FHWA commented that the joint-use bridge alternative was viable, but that transit should not be placed inside of the proposed closed segmental box girder. The CRC Project developed an open-web box girder (see rendering below) in response to the FHWA comments. The open web box girder type uses a web of concrete structural members on each side of the box, with openings between these members rather than a fully enclosed box structure.



Open-web box girder rendering



A combined highway/transit bridge was a key result of the value engineering process.

A bridge type screening workshop was conducted with the State Bridge Engineers from ODOT and WSDOT to identify all potential bridge types for 3-bridge and 2-bridge river crossing alternatives. The workshop identified 10 bridge types that could work for the project. Preliminary engineering was advanced for each bridge type and type, size and location (TS&L) plans were completed (representing thirty percent design completion). Advancing each of these bridge types to the allowed the CRC Project team to determine the size of bridge features, develop detailed quantities for materials, and estimate construction costs. This information was used to support the biological assessment and provide more certainty to the regulatory agencies regarding the impacts that the project had identified. With this information, the CRC Project was able to better identify what work would be allowed during the in-water work window, reducing mitigation requirements and construction restrictions.

The open web box girder bridge type was selected by the Project Sponsors Council in 2009. The Independent Review Panel and Bridge Review Panel recommended to ODOT and WSDOT to revisit the decision to select the open web box and to select a more traditional type of structure such as a cable stay, arch or deck truss. At the time, an open web box was considered an innovative structure type in North America. The Governors of Oregon and Washington, in response to the recommendations of the Bridge Review Panel, directed the CRC Project to advance the project with a deck truss structure (see rendering on next page) in 2011. (A deck



truss is a type of bridge in which the roadway deck is placed above the structural parts. The supporting beams of the truss structure beneath the deck are arranged in triangular patterns to distribute structural load.) The FEIS and Record of Decision included this deck truss structure type, described as:

The parallel bridges that form the existing I-5 crossing over the Columbia River would be replaced by two new parallel bridges slightly downstream from the existing alignment. The proposed bridge type is a composite deck truss in which the “walls” are constructed of diagonal steel members that would allow for a partially open-sided, covered passage for the multi-use pathway and light rail trackway. The eastern structure would accommodate northbound highway traffic on the upper bridge deck, with a 16- to 20-foot-wide bicycle and pedestrian path underneath; the western structure would carry southbound traffic on the upper bridge deck, with a two-way light rail guideway below. While the existing bridges have only three lanes each, with virtually no shoulders, each of the new bridges would be wide enough to accommodate three through lanes and two auxiliary lanes, and would provide full-width shoulders. The auxiliary lanes on the outsides of each structure would provide improved safety and reduced congestion for traffic entering and/or exiting the highway at one of the closely spaced interchanges near the river.

The CRC Project analyzed the effects of several different possible bridge heights on the bridge substructure in support of the USCG Bridge Permit process. Each different proposed height changed the size and number of drilled shafts that would be needed to support the river crossing. The designs were informed by the findings of the drilled shaft and driven pile test project, to minimize the cost impact of increased bridge height. In support of the USCG permitting, USACE Section 408 navigation channel review, and NMFS Biological Assessment, the CRC Project developed a draft construction schedule and staging concepts to identify construction durations and the duration of impact to each navigation channel.

Concept plans were developed to support the development of procurement documents for the Columbia River Bridge and Approaches Design-Build Request for Proposals. These plans included information on type and size of foundations, alignment, profile, cross sections and conceptual staging plans for construction of the new river crossing and removal of the existing bridges.



Type, size and location engineering was completed for multiple bridge types to define impacts in the environmental process.



Conceptual Design and Preliminary Engineering— Columbia River Bridge Temporary Pile Test Program

The CRC Project identified risks associated with driving piles in the Columbia River through the consultation process required under the Endangered Species Act, initiated because of the presence of several threatened or endangered species of fish and marine mammals. (A pile is a circular steel column that is driven into the river bottom to provide support for bridge structures and temporary construction work needs. Installation of piles can create noise associated with metal striking metal.) The Record of Decision for the CRC Project incorporated a requirement that the bridge be constructed with drilled shafts for the permanent foundations for a new river crossing, limiting the use of driven piles to temporary structures. A temporary test pile program was developed to evaluate:

- The noise effects on land and underwater from pile installation in the Columbia River
- Methods to minimize underwater noise that could affect fish and wildlife during construction
- Pile installation methods to ensure the construction phase of the replacement I-5 bridge would stay on schedule and on budget.

The CRC Project conducted an in-water pile installation and noise reduction study. Six temporary test piles were installed in the Columbia River near two proposed pier locations for the replacement I-5 bridge.

Two methods were used for installation – vibratory and impact. Load testing and monitoring occurred for several days following installation. The test piles were removed after the study was complete.

While installing the piles, an underwater noise-reducing technique known as a “bubble curtain” was tested. Walls of air bubbles are created to surround the pile and absorb the noise that may be harmful to fish and wildlife species. Two types of bubble curtains were tested after baseline underwater noise levels were monitored.

Noise and vibration levels on land were monitored in downtown Vancouver and Hayden Island before the project began and while it was occurring to assess the effects of the installation in the nearby communities. Ten noise monitors and five vibration monitors were used to measure effects of the test project.

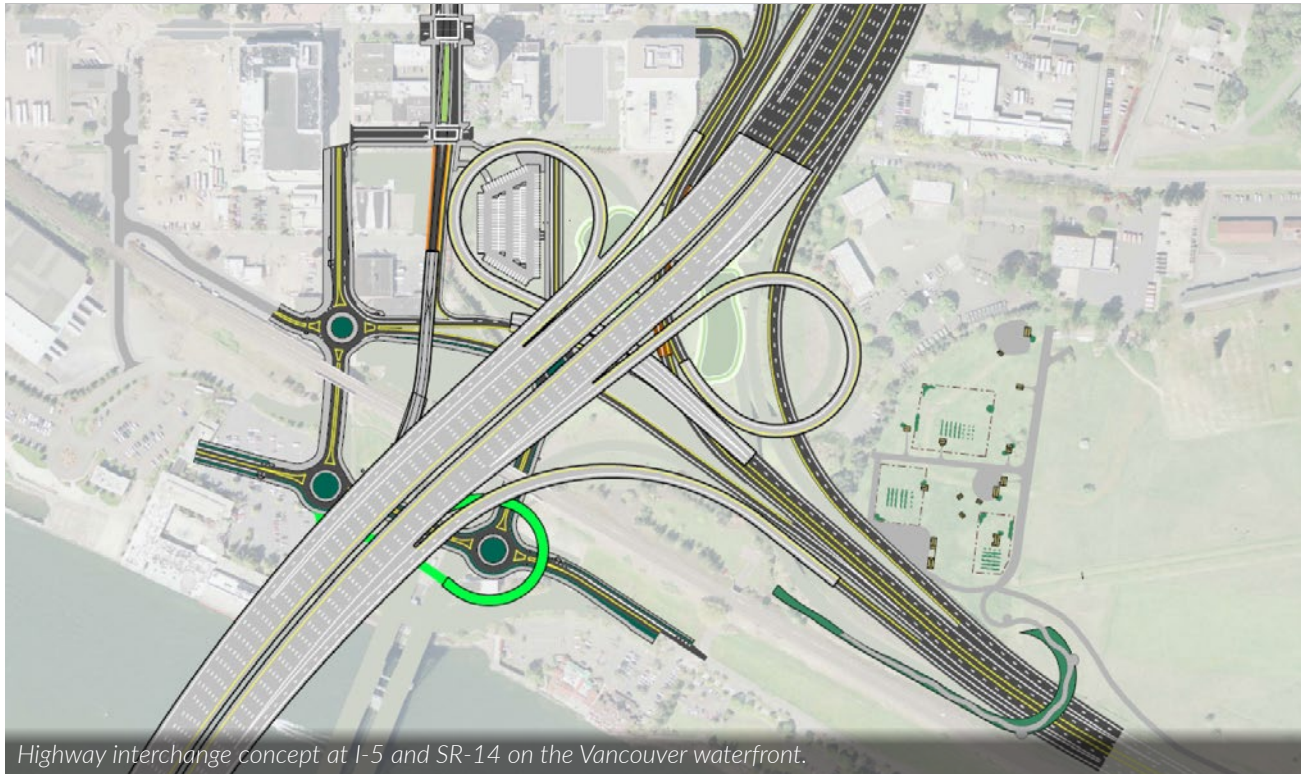
These test pile programs were important in determining construction impacts, minimizing those impacts, reducing mitigation requirements such as limited seasonal windows for in-water work, and reducing the contingencies that would otherwise be necessary to budget for uncertainties associated with the potential impacts of bridge construction. The findings from these programs are expected to be applicable to a future bridge project.

Conceptual Design and Preliminary Engineering –Drilled Shaft and Driven Pile Test Program

The CRC Project identified risks associated with geotechnical conditions in the riverbed and restrictions on in-water work as among the greatest areas of uncertainty for predicting the cost of the project. To mitigate this risk, the CRC developed and implemented an additional test program that focused on drilled shafts and driven piles to gather information regarding:

- Construction techniques for bridge foundations
- Noise and ground vibration levels produced by pile driving on land at different locations and distances
- Installation methods to ensure the construction phase of the replacement I-5 bridge would stay on schedule and on budget
- Methods and procedures to help ensure foundation work will not diminish groundwater quality.

The drilled shafts were instrumented to evaluate the integrity of the shafts and to measure the strength and stability of the soils. The results of the drilled shaft and driven pile test program validated the feasibility of constructing the project with deep drilled shafts as proposed, which allowed the CRC Project team to refine the project cost estimate by narrowing the range of cost and schedule risk allocated to bridge foundations. As with the temporary test pile program that focused on in-water work impacts, the findings from these programs are expected to be applicable to a future bridge project.



Highway interchange concept at I-5 and SR-14 on the Vancouver waterfront.

Conceptual Design and Preliminary Engineering –Highway Interchanges

Project development for the CRC included conceptual engineering of seven highway interchanges. The design addressed issues such as geometric and weaving standards, right-of-way impacts and constraints, truck acceleration rates and highway ramp grades; and pedestrian and bicycle connectivity through interchanges. Most freight, pedestrian and bicycle engineering issues were incorporated into interchange engineering. Each of the interchanges was in itself a significant project with complex engineering issues and stakeholder concerns. The CRC Project worked closely with stakeholder groups on the interchange engineering issues, as described in **Section 5: Project Management, Leadership and Coordination**.

The FEIS provided the following summary of highway, interchange and local street improvements proposed for the CRC Project:

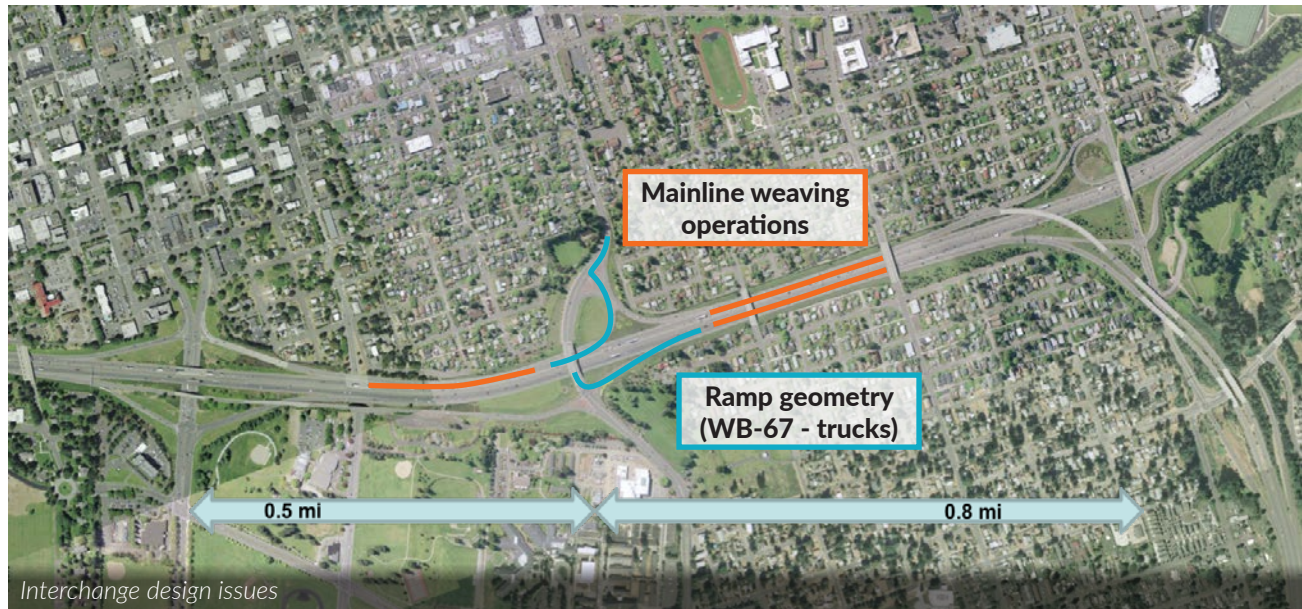
The LPA includes improvements to seven interchanges along a 5-mile segment of I-5 between Victory Boulevard in Portland and SR 500 in Vancouver. These improvements include some reconfiguration of adjacent local streets to complement the new interchange designs, as well as new facilities for bicyclists and pedestrians.

- **Victory Boulevard:** Improve the northbound on-ramp and southbound off-ramp to lengthen merging distances. If the highway component of the project were phased, these improvements would be deferred.



- **Marine Drive Interchange:** Reconfigure to allow the highest volume movements to move freely without being impeded by stop signs or traffic lights.
- **Hayden Island Interchange:** Restructure to include ramps parallel to the highway rather than looped ramps, thus lengthening merging distances.
- **SR 14:** Rebuild ramps to tie in with higher bridges over the Columbia River, and relocate access points into and from downtown Vancouver to improve traffic circulation. Raising I-5 at this interchange allows for an extension of Main Street beneath the BNSF railroad crossing, providing greater access to Vancouver's waterfront.
- **Mill Plain Boulevard:** Reconfigure to improve the capacity of the interchange by reducing delay for traffic entering or exiting the freeway (including significant freight traffic).
- **Fourth Plain Boulevard:** Improve ramps to better accommodate freight traffic and construct new access to the proposed park and ride at Clark College.
- **SR 500 Interchange:** Construct new highway-to-highway connections to improve travel times and reduce traffic on local streets accessing I-5. If the highway component were phased, the ramps connecting SR 500 and I-5 to and from the north would be deferred.

Highway safety and mobility improvements were anticipated as a result of auxiliary (add/drop) lanes that were proposed for strategic locations within the corridor. The auxiliary lanes were proposed to allow vehicles to travel between given points without merging into mainline interstate traffic, minimizing conflicts between through-traffic using the interstate and vehicles exiting or entering the highway.



Additionally, the interchange improvements defined in the LPA included local surface street improvements that would have enhanced local connections that are impeded by existing highway interchange infrastructure.

Conceptual Design and Preliminary Engineering – Bicycle and Pedestrian Improvements

Proposed bicycle and pedestrian improvements were included in the CRC project. These included new facilities such as a multi-use pathway across the Columbia River and North Portland Harbor, street improvements around the rebuilt interchanges, and new facilities for bicyclists and pedestrians around the new light rail stations and park and rides. The improvements identified in prior project planning are described below from the south end of the project to the north end.

- **North Portland:** The proposed design of the Marine Drive interchange would have provided multi-use paths below the interchange, and paths to connect to existing routes on either side of the interchange and to the Expo Center light rail station.
- **Hayden Island:** From North Portland Harbor, anew multi-use path was proposed to connect the North Portland Harbor bridge and the Columbia River bridge, with access from North Jantzen Drive, North Hayden Island Drive, and the light rail station.
- **River Crossing:** The new northbound bridge over the Columbia River was also planned to accommodate a 16- to 20-foot-wide multi-use pathway under the highway deck.
- **Downtown Vancouver:** The proposed multi-use path would have provided access to downtown Vancouver via a ramp and to the Vancouver waterfront via stairs and/or an elevator. This multi-use path would have provided connections to Old Apple Tree Park, the Land Bridge, and regional pedestrian and bikeway facilities that exist throughout Vancouver.

- **Evergreen Boulevard and Community Connector:** A new community connector/overpass with landscaping, pathways and other public space was proposed to connect to the south of Evergreen Boulevard.
- **Mill Plain Boulevard:** The CRC Project proposed to improve bicycle and pedestrian safety by providing bike lanes; 12-foot sidewalks; clear delineation and signage; short perpendicular, signalized crossings at the ramp terminals; ramp orientations to encourage high pedestrian visibility; and new connections to F Street and to Marshall Park.
- **Fourth Plain Boulevard:** To increase access to adjacent neighborhoods and the Clark Park and Ride, the project proposed a 14-foot multi-use path on the east side of I-5 between Fourth Plain Boulevard and McLoughlin Boulevard.
- **29th and 33rd Street Overpasses:** The CRC Project proposed new I-5 overpasses at 29th Street and 33rd Street.



TriMet's rail system during CRC project development.

Conceptual Design and Preliminary Engineering – Transit

Project development for the CRC included conceptual engineering of the transit mode options and of the locally preferred LRT transit components. Conceptual engineering to support the development of the transit options and components included conceptual design of a transit bridge over North Portland Harbor; one elevated station and six street-level stations; and three park and ride garages, as well as identification and resolution of right-of-way and traffic impacts.

The primary transit element of the LPA was a 2.9-mile extension of the existing MAX Yellow Line light rail from the Expo Center in north Portland, where it currently ends, to Clark College in Vancouver. Conceptual engineering was completed to define the light rail alignment and station locations in Portland, downtown Vancouver, and on 17th Street and McLoughlin Boulevard to Clark College. To accommodate and complement this major addition to the region's transit system, a variety of additional improvements were also proposed and developed through the conceptual design effort, including:

- Three park and ride facilities in Vancouver.
- Expansion of TriMet's Ruby Junction light rail maintenance base in Gresham, Oregon to accommodate the maintenance responsibility associated with the nineteen additional trains that would have been added to the light rail system.
- Changes to C-TRAN local bus routes.
- Upgrades to the existing Yellow Line light rail crossing over the Willamette River via the Steel Bridge.

Public Involvement

Public involvement was an important feature of the long-range planning and project development processes. Through March 2013, the CRC Project participated in 1,277 public events, leading to 33,984 face-to-face contacts to allow people to learn about the project and provide input. Outreach occurred regionally but was focused in the project area and balanced between the states. Public involvement continued beyond the environmental phase as the design and finance plan was refined and project delivery options were developed.

Extensive outreach was conducted to a broad set of community audiences. The public involvement program supported the dissemination of project information in printed copy and electronic form through the CRC Project website; attendance at fairs, festivals and community events; literature drops at community centers; presentations to neighborhood, service and business groups; and presentations to community and neighborhood groups. The project's mailing list, used to encourage participation in public events and involve the broader community, grew to nearly 6,000 email addresses and more than 14,000 postal mailing addresses. Diverse outreach techniques were used to reach low-income and minority populations through organizations that represent their interests, at locations in their communities.

The project engaged stakeholders and solicited comments and recommendations through topic- and geography-specific advisory groups; public open houses, design workshops and issue-specific public meetings; and ongoing opportunities to meet with staff at the project office, by phone, email and online comment and question submittal. The CRC Project provided regular briefings to elected officials, boards, and civic leaders throughout the region.



Community input shaped project development, outreach and design. Through implementation of the public involvement program, more than 12,000 public comments were received on a range of topics. Public comments significantly contributed to project designs, including the following topics:

- **Purpose and Need:** The public, stakeholders and partner agencies provided comments that led to the identification of project area problems, resulting in the CRC Purpose and Need Statement. Community members contributed to the proposal of over 70 ideas as potential solutions for river crossings, transit, freight, bicycles, pedestrians, roadways and transportation demand management. Evaluation criteria were developed with a 39-member Task Force based on the Purpose and Need and Visions and Values of the community.
- **Preliminary Alternatives:** Public feedback was encouraged on 23 initial river crossing ideas and 14 public transportation ideas and helped narrow the options to nine river crossings and seven transit ideas. These were combined into 12 multimodal preliminary alternatives to move forward for additional analysis.
- **Environmental Impact Statement (EIS) Alternatives:** As a result of three sets of open houses, numerous informational booths, meetings with community groups and ongoing meetings of the CRC Task Force, the project included community-supported solutions that improved the Columbia River crossing at I-5, added high-capacity transit to the project area, improved seven I-5 interchanges, improved bicycle and pedestrian connections and used transportation demand strategies to encourage alternative modes of transportation. The project team made a draft recommendation regarding project alternatives to move forward into the DEIS for further evaluation. Based on additional public testimony at public hearings in front of partner agency councils, the CRC Task Force voted to add alternatives that would reuse the existing I-5 bridges.
- **Locally Preferred Alternative:** The locally preferred alternative was selected following a 60-day public comment period on the DEIS. As a result of the outreach activities and community notification, the project received over 1,600 written or transcribed verbal comments about the DEIS. Comments received with the highest frequency were those stating a preference for one of the DEIS alternatives or options. The LPA consisted of three primary elements: river crossing, transit mode and transit terminus. Of the people who expressed a preference, the replacement I-5 bridges, light rail and the Clark College transit terminus garnered the most favorable comments. Prior to voting to recommend an LPA, the CRC Task Force

received a summary of public comment and heard public testimony. Following the Task Force recommendation, each of the six local sponsoring agencies had hearings to receive public comment and then voted on an LPA recommendation. All six sponsoring agency boards and councils also recommended that a replacement bridge with light rail to Clark College be the LPA.

- **Refinement of project designs:** The CRC Project worked extensively with its agency partners, advisory groups, community stakeholders and the public to review, advance and refine aspects of the design for the locally preferred alternative. Project refinements that incorporate and reflect public feedback included the following:
 - Number of lanes on the bridge
 - Phased interchange improvements and re-use of North Portland Harbor Bridge
 - Marine Drive alignment
 - Bicycle and pedestrian pathway design and location
 - Urban design and architectural guidance
 - Hayden Island transit station design
 - Vancouver transit alignment
 - Vancouver transit station design
 - Local traffic bridge across North Portland Harbor
 - Columbia River bridge type.

Additional detail on the goals for public involvement, stakeholders, public involvement approach, and public involvement events held between February 2005 and August 2011 is provided in Appendix B to the CRC FEIS.

FTA Capital Investment Grant “New Starts” Process

The CRC project participated in the *Capital Investment Grant New Starts program*. The Capital Investment Grant (CIG) Program is FTA’s primary grant program for funding major transit capital investments, including heavy rail, commuter rail, light rail, streetcars, and bus rapid transit. The CIG is a long-running program originating from a proposal by President Kennedy in 1962 calling for a program of federal capital assistance for mass transportation, first enacted in the Urban Mass Transportation Act of 1964. The CIG is a discretionary grant program unlike most others in government. Instead of an annual call for applications and selection of awardees, projects seeking CIG funding complete a series of steps over several years to be eligible for funding. For New Starts projects, the law requires completion of two phases in advance of receipt of a construction grant agreement—Project Development and Engineering; (at the time of prior project development, the phases were Preliminary Engineering and Final Design).

The FTA works closely with project proponents throughout the Project Development and Engineering phases; for this reason, the New Starts process under the CIG program is

fully integrated into project development, rather than a stand-alone funding and finance activity.

The FTA rates each project that is participating in the project development process, based on information submitted by the project proponent to demonstrate the mobility benefits, cost effectiveness, land use and environmental benefits of the project, and make funding recommendations to Congress in an Annual Report on Funding Recommendations. The funding recommendation process follows general commitment guidelines rather than explicit criteria; the FTA states that:

- Funding should be provided to the most qualified projects to allow them to proceed through the implementation process on a reasonable schedule, to the extent that funds can be obligated to such projects in the upcoming fiscal year.
- Funding recommendations will be based on the results of the project evaluation process and resulting project justification, local financial commitment, overall project ratings, and considerations such as project readiness and the availability of funds.
- FTA encourages project sponsors to provide an overmatch as a means of funding more projects and leveraging state and local financial resources, as well as other Federal financial resources.

Projects that receive an overall project rating of medium-high or above are typically funded; some projects with an overall project rating of medium are also funded.

The New Starts program follows the federal fiscal calendar, rather than program-specific deadlines. This allows the FTA to work with project proponents to determine the best timing for project evaluation, which may take into account both the readiness of the project, and the availability of funding anticipated in a given fiscal year or a longer financial planning horizon. The FTA makes funding recommendations that address the total amount of funding to be provided to a project, but these funds are typically allocated through a multi-year grant agreement, with the funds for each year subject to congressional appropriation.

The FTA accepted the CRC Project into the project development phase in 2009, advanced the project into Engineering in 2013 and worked closely with the project team throughout the project development and environmental process. FTA is required by law to evaluate a proposed project against established New Starts criteria and to ensure that prospective grant recipients demonstrate the technical, legal, and financial capability to implement the project. To do so, the FTA assigns project management oversight (PMO) and financial management oversight (FMO) contractors to the project and performs a detailed review of the NEPA environmental documents.

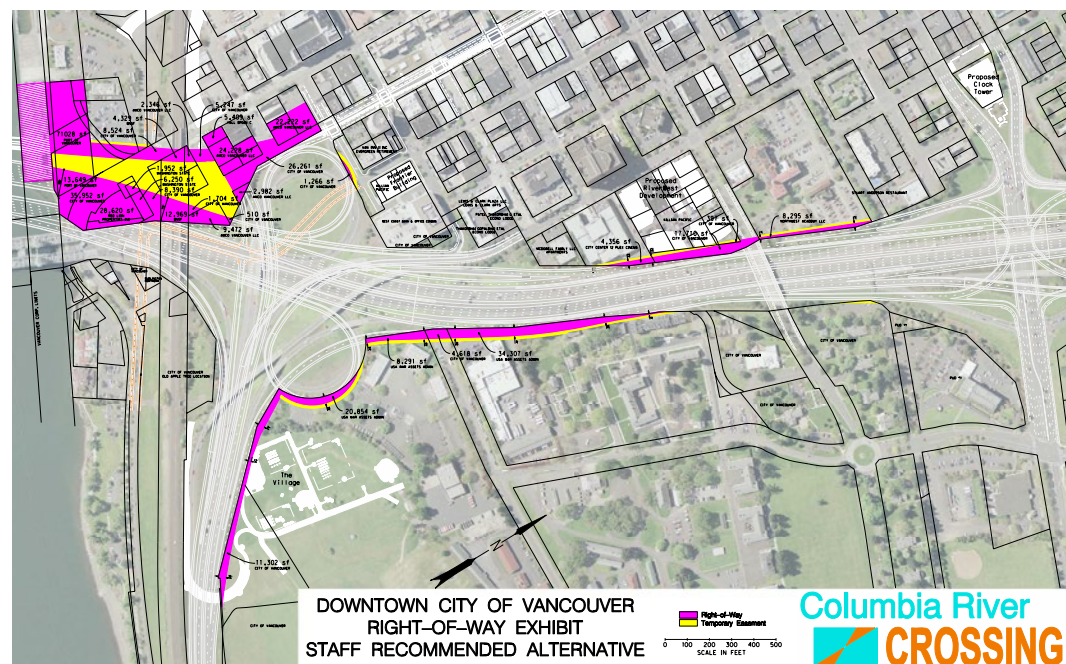
The FTA recommended \$850 million in funding for the CRC project in the FY 2013 Annual Report on Funding Recommendations, publishing an overall project rating of medium-high,

a Project Justification Rating of medium-high, and a Local Financial Commitment Rating of medium. Additional discussion of the financial commitment rating and future prospects for federal funding is located in **Section 4: Funding and Finance**. To the extent that a renewed project includes a similar transit component, a new project could pursue New Starts grant funding, and much of the engineering and analysis completed previously would be useful in preparation of a new funding request. The timeframe for a renewed New Starts grant process would take several years and would depend on when a new project got started, the features of a new project, including the development of a funding plan that would demonstrate sufficient local financial commitment; and progress on any steps required to modify the design, cost estimate and environmental review of the project.

Real Estate Acquisition Management Planning

As required by the FTA as part of the New Starts process, the CRC Project developed a *Real Estate Acquisition Management Plan* (RAMP) to:

- Identify and minimize the substantial schedule and budget risks inherent to real property activities required by major capital projects using federal assistance;
- Formulate a real estate schedule commensurate in detail with specific project phases;
- Comply with all Federal laws, regulations and guidance during implementation of a real property acquisition program; and
- Facilitate reviews by a project management oversight consultant (PMOC).



A Real Estate Acquisition Management Plan was completed as part of the FTA New Starts process.

The RAMP included implementation strategies, an acquisition schedule, a cost estimate for acquisitions, and processes for acquisition and relocation. The RAMP included maps of use designations by delivery package, (transit use, highway use, or joint use). These designations were used to determine whether FTA or FHWA requirements would be followed for each acquisition (with FHWA requirements applied to both Highway Use and Joint Use acquisitions).

External Review & Validation

CRC project planning benefited from *external review and validation* of key elements of project development, through the Cost Risk Assessment/Cost Estimate Validation Process, a Value Engineering Study, a Travel Demand Modeling Review Panel; a Greenhouse Gas Expert Review Panel, an Independent Review Panel, a Bridge Review Panel, and an Oregon Treasurer CRC Finance Review.

Cost Risk Assessment/Cost Estimate Validation Process

The capital cost estimates used for the CRC Project reflect the results of WSDOT's *Cost Risk Assessment (CRA)/ Cost Estimate Validation Process (CEVP)*, a risk assessment methodology that accounts for uncertainties that may cause project costs to increase.

CRA/CEVP panels were conducted prior to every milestone during the CRC Project. CRA/CEVP was used to estimate the range of alternatives that were analyzed in the Draft Environmental Impact Statement, the Locally Preferred Alternative, Refinements to the LPA in the Final Environmental Impact Statement, and when phasing/ packaging options were identified.

The CEVP/CRA process convenes an independent panel of experts to review the project cost estimate and to identify/ quantify potential design/construction risks to the project schedule and budget. The cost estimates are modelled with the identified risks to determine the amount of contingency. Contingency is added to the base capital cost estimate to address these potential cost increases and to produce a range of cost estimates reflecting the probability, or confidence, that the actual cost of the project will be less than the estimated cost.

Origins of CEVP®: In the late 1990s, significant underestimation of cost and schedule for major infrastructure projects became a signature issue. Numerous projects including London's Jubilee Line, the Channel Tunnel and Boston's Central Artery/Tunnel Project experienced very large cost and schedule overruns that were highly visible and broadly criticized. Studies of individual projects and histories, showed that overly optimistic estimating was not a new problem and identified several fundamental issues that needed to be corrected. A central theme of the more successful of these new methods was the explicit consideration of uncertainty (risk and opportunity) in the estimating process. WSDOT was an early leader in developing risk-based approaches to cost and schedule estimating in the US, developing its Cost Estimate Validation Process in 2002.

Value Engineering Study

The CRC Project conducted a Value Engineering Study in 2007 using an independent consultant. The project was divided into four logical segments to perform value engineering (VE) and qualitative risk assessments. The mission of each team was to verify or improve upon the proposed alternatives. Each team applied the principle and practices of value engineering and reviewed previously defined risks and risks identified during each study. Each study team evaluated the alternatives against a set of predetermined performance attributes. Improvement opportunities were based on a value index of performance/cost for each alternative as it related to a baseline of performance attributes.

Twenty-seven different subject matter experts were engaged during this process. Each of the teams evaluated the previously established risk register (a detailed matrix identifying project risks). The VE Workshops generated 13 ideas for highway improvements, three ideas for transit and five ideas for the River Crossing. Among the most significant concepts generated from the value engineering process was the shared highway/transit bridge, which was ultimately adopted as the preferred approach and generated significant cost savings to the project as a whole, as well as improving the cost-effectiveness rating of the transit component in the New Starts funding process.

Travel Demand Modeling Review Panel

The Travel Demand Model Review Panel (Panel) was tasked with reviewing and evaluating the assumptions implicit in the travel demand model for the CRC project. This review was requested by partner agencies in July 2008, as part of the selection of a Locally Preferred Alternative for the project. Resolutions passed by partner agencies made the following recommendations related to review of the CRC travel modeling assumptions:

- Further analysis of the greenhouse gas and induced automobile demand forecasts should be performed. The analysis should include comparisons related to the purpose and function of the so-called “auxiliary” lanes. (Metro Council, Resolution 08- 3960B, July 17, 2008).
- The CRC project should contract for an independent analysis of the greenhouse gas and induced automobile travel demand forecasts for the project. (Portland City Council, Resolution 36618, Exhibit A, July 9, 2008).
- The CRC project should contribute to a reduction of vehicle miles traveled (VMT) per capita in the bi-state metropolitan area. (Portland City Council, Resolution 36618, Exhibit A, July 9, 2008).
- Independent validation of the greenhouse gas and climate change analysis conducted in the Draft Environmental Impact Statement should be performed to determine the project’s effects on air quality, carbon emissions and vehicle miles traveled per capita (CRC Task Force, Resolution Recommendations, June 24, 2008).

The Panel addressed seven questions posed by the CRC partner agencies:

Question 1 – Were fuel price and vehicle operating cost assumptions used in the model reasonable?

The Panel concluded that the vehicle operating cost assumptions, of which 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.

Question 2 – Were the tolling methods used in the model reasonable?

The Panel concluded that the overall approach to the tolling analysis employed by the CRC Project is within standard practice. The resulting volumes on the I-5 Bridge with tolls compared to No-Build volumes demonstrate that the tolling methods are reasonable.

Question 3 – Were the traffic projections for I-5 and I-205 from the model reasonable?

The Panel concluded that model results that indicated that the Build Alternative (LPA) volume difference relative to the No-Build Alternative (6,000 fewer vehicles per day / 3 percent reduction on I-5 and 3,000 additional vehicles per day / 1 percent increase on I-205) are reasonable, due to the fact that:

- There is a higher level of transit service and a resulting higher transit share in the Build Alternative which reduces auto volumes on I-5;
- There are tolls on I-5 in the Build Alternative versus no tolls in the No-Build Alternative which also reduces auto volumes on I-5 and increases volumes on parallel facilities, like I-205;
- There is no added highway capacity north of or south of the project limits; and
- There are changes to trip distribution resulting in a decrease of discretionary trips crossing the river because of the toll.

Question 4 – Were the vehicle miles traveled (VMT) results reasonable?

The Panel concluded that the results showing a decrease in auto VMT on I-5 and a net regional increase (small) overall is reasonable because:

- There is a higher level of transit service and a resulting higher transit share in the Build Alternative, which results in lower auto VMT on I-5; and
- There are tolls on I-5 in the Build Alternative versus no tolls in No-Build Alternative which results in diversion and higher regional VMT.

Question 5 – Were the bridge auxiliary lanes modeled correctly?

The Panel concluded that while the coding of a four-mile continuous auxiliary lane may be unusual in some urban areas, there are local examples of long auxiliary lanes that currently operate and are modeled similarly in the Portland/Vancouver metro region. Since this length of an auxiliary lane is consistent with regional coding (modeling) practices, this is a reasonable assumption for this project.

Question 6 – Was the approach used to estimate induced growth reasonable?

The Panel concluded that the use of the Metroscope land use and transportation model and the travel demand model results supported the national research findings related to the potential for induced growth (development that could result from adding roadway capacity). The Panel felt that the use of multiple methods (i.e., case studies, Metroscope, national research) to evaluate induced growth was helpful. The evaluation of a worst-case scenario in Metroscope (it assumed a larger build project than the LPA and no tolling) was useful and appropriate.

Question 7 – Were the induced growth findings reasonable?

The Panel agreed that the conclusion of the CRC project that the highway capacity improvement would have a low impact to induce growth was reasonable for this corridor because the project is located in a mature urban area/built corridor.

The Panel also made the general finding that the Travel Demand Model used by the region was an advanced trip-based tool and that it was a valid tool for a project of this type.

Greenhouse Gas Emission Analysis Expert Review Panel

A panel of independent experts reviewed and evaluated the greenhouse gas emissions analysis presented in the project's Draft Environmental Impact Statement (EIS). The Greenhouse Gas Emissions Expert Review Panel found the CRC analysis and conclusions to be reasonable. The Panel agreed with the CRC finding that the Locally Preferred Alternative would generate lower greenhouse gas emissions than the no build alternative.

Independent Review Panel

The *Independent Review Panel* (IRP) was assembled by the Governors of Oregon and Washington and tasked to:

- Review the project implementation plan
- Review the project finance plan
- Review project performance measures

The IRP solicited information from project stakeholders, held public meetings, and extensively researched the project issues. The IRP developed findings which identified areas on which project staff should concentrate. The IRP provided 30 recommendations

to allow the project to move forward and achieve the Purpose and Need. These recommendations fell into six general categories. The IRP recommendations, and the measures that were taken to address them, are outlined below:

- 1. Review project phasing.** The CRC team, in consultation with the project stakeholders, developed construction phasing options for the project. These options were to be based on potential funding scenarios that could result from either a delay or a reduced amount of funding that is being sought from the different funding sources.
- 2. Re-invigorate public involvement.** The CRC team provided additional updates to project working groups and the general public, and received further input from them on many of the topics these groups addressed.
- 3. Resolve the interchange design at Marine Drive and Hayden Island.** The CRC team used the Integrated Project Staff team, working closely with representatives of the community, to develop and review various options for the Hayden Island and Marine Drive interchanges. This resulted in a unanimous recommendation from the CRC Project Sponsors Council to advance the revised Hayden Island interchange design and in the widespread acceptance by the public and both Ports of this design.
- 4. Review the bridge type selection.** The CRC team assembled a review panel of national and international bridge experts, which led to the eventual selection of the composite deck truss as the preferred bridge type. The Bridge Review Panel is discussed in further detail in the next section.
- 5. Establish a long-term project management/governance plan that would extend interagency governance (FHWA, FTA, WSDOT and ODOT) into subsequent project phases beyond approval of the Record of Decision.** The oversight body was to be charged with the responsibilities to support project funding efforts, coordinating tolling policy (initial and on-going) and oversight of the various agencies responsible for project delivery.
- 6. Update the cost estimate.** The overall cost estimate for the project was updated following the Bridge Review Panel in Spring 2011. The results of this analysis were used to update the financial plan and cost estimate.

Bridge Review Panel

The IRP recommendation to review the bridge type selection led to the formation of the *Bridge Review Panel* (BRP). The BRP was comprised of individuals with national and international experience designing, managing and constructing large bridge projects. The BRP delivered a report to the governors of Oregon and Washington in February 2011.

The BRP's primary recommendations focused on bridge type. 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.

As a result of the BRP's recommendation, the Oregon and Washington governors directed the CRC project to discontinue further design work on the open web bridge type and

begin an expedited review of the panel's three bridge type options. The governors stated that the analysis must consider cost, schedule, environmental impact, commitments made to communities and stakeholders in both states, and overall risk.

Later in February 2011, ODOT and WSDOT responded to the governors by recommending to proceed with the composite deck truss bridge type. The ODOT and WSDOT recommendation found that the composite deck truss would be the most affordable, would maintain the project schedule, minimize environmental impacts, honor commitments to communities and stakeholders, attract the largest pool of contractors (thus allowing for the most competitive prices), and would minimize risk. More information on the review process and findings by ODOT and WSDOT is provided in the CRC Project memorandum, *Columbia River Crossing: Key Findings and Recommendation related to Bridge Type, February 2011 (WSDOT and ODOT 2011)*.

A NEPA reevaluation was also completed comparing the impacts from the composite 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 truss bridge design would be similar, and FTA and FHWA determined that no additional NEPA documentation was necessary beyond the FEIS.

The governors considered many factors to make the decision on bridge type. The public, stakeholders, project advisory committees, project sponsors staff, and local elected officials commented on the bridge type options. Listening sessions were held to receive public comment. On April 25, 2011, the governors announced the selection of the composite deck truss as the preferred bridge type. Reducing and eliminating risks to project schedule and budget, affordability, impacts, and securing funding were all factors considered in the decision.

Oregon Treasurer CRC Finance Review

Oregon Governor John Kitzhaber asked the Oregon State Treasurer to conduct an *independent review* of the Columbia River Crossing Project's financing plan in 2011. The Treasurer's office and its independent consultants validated much of the CRC financing plan, and made recommendations to reduce and manage financial risk. The review found that the CRC tolling financial projections should be adjusted to account for the depth and length of the economic recession that was being experienced at the time. New funding or financing sources were also suggested. Governor Kitzhaber accepted the more conservative financing plan recommended by the Oregon Treasurer, and the Treasurer's recommendation to level the debt service and reflect stalled economic growth was incorporated and reflected in the Final Environmental Impact Statement (EIS).

Section 7:

Project Delivery

Introduction

SSB 5806 suggests consideration of delivery methods, including design-build procurement and others that enhance or improve delivery and outcomes. CRC planning included analysis and recommendations regarding project delivery. Project delivery methods refer to the overall process by which a project is designed, constructed, and/or operated and maintained. CRC planning considered delivery methods, procurement methods, and the phasing, sequencing and packaging of project elements. The analysis and findings were summarized in the *CRC Project Delivery and Procurement Plan Final Report* (PDPP) (September, 2012). The recommendations of the Bridge Review Panel, the Cost Estimate Validation Process (CEVP), Project Sequencing workshops, Project Packaging and Delivery Method workshops, a Constructability Review, the FEIS, and a Transit Value Engineering Workshop were all inputs into the PDPP analysis and recommendations.

Project Delivery Methods

Funding options help determine the delivery methods for projects within a program. Public funding allows for more traditional delivery methods, such as:

- Design-Bid-Build (DBB);
- General Contractor/Construction Manager (GC/CM);
- Design-Build (DB);
- Design-Furnish-Install (DFI); and
- Design-Build-Operate-Maintain (DBOM).

Private funding (such as public-private partnerships) enable additional delivery method options. Private funding comes in the form of private financing which can carry unique contractual obligations; discussion of public-private partnerships can be found in Section 4. These additional delivery method options include:

- Design-Build-Finance (DBF);
- Design-Build-Finance-Maintain (DBFM);
- Design-Build-Finance-Operate-Maintain (DBFOM); and
- Build-Own-Operate.

Public Funding Delivery Methods

Design-Bid-Build (DBB) is often considered to be the “traditional” method for delivery of public works projects. With this delivery method, an owner develops or engages professionally capable firms to develop a complete design package and specifications. The owner uses this approach to award a separate construction contract that is based on the designer’s completed construction documents. The usual procedure involves the owner advertising for bids or proposals and the selection of the construction contractor based on specific performance criteria, typically the price of the work (or “low bid”). In developing the construction documents, the owner may choose to do the design work “in-house” utilizing the owner’s own personnel or by retaining an outside designer to prepare the documents. In either case, the owner is responsible for the details of the design and warrants the quality of the construction design documents to the construction contractor(s).

General Contractor/Construction Manager (GC/CM) – Under this delivery method, an owner would initially advance a design, using either “in-house” personnel or an outside designer working under contract, to a point where the scope of the project is sufficiently defined. The owner would then enter into a separate contract with a GC/CM to provide preconstruction services during design, working closely with the designer and other owner representatives, and subsequently serve as the general contractor during construction. The second phase of the GC/CM delivery method includes negotiation of a guaranteed maximum price (GMP) for the construction phase. If the owner and contractor are unable to agree on a GMP, the owner can opt to proceed using a competitive bid as in the DBB delivery method. The owner retains control of the design process and is responsible for the quality of the construction design documents, but gains the added value of a collaborative construction professional on the program team at a stage in the design process in which definitive input can have a positive impact on the project. The potential disadvantage of GC/CM is that the negotiated contract price may be higher than a competitively bid price. During CRC project development, alternative public works legislation in Washington legislation stated that the Prime Contractor could not self perform more than 30% of the contract value which is a limiting factor for roadway civil construction contracts (Washington legislature has since raised this limit to 50%).

Design-Build (DB) is a project delivery method in which the owner procures design and construction services in the same contract from a single legal entity referred to as the design builder. The DB entity is liable for the outcome of the project and is obligated to complete the project while meeting the specified contract price, completion schedule, and design or performance parameters. The owner’s relationship with the DB contractor must be based on a strong degree of mutual professional trust, and the owner’s requirements

must be thoroughly captured in the performance requirements, as the owner is relinquishing some control over the final design of the project. The DB contractor has more flexibility to execute the project under this delivery method.

Design-Furnish-Install (DFI) is a project delivery method in which the owner procures design, manufacturing or furnishing of items, and installation or construction under the same contract from a single legal entity. The DFI method is typically used when the principal activity is the manufacture of a product with installation as a relatively minor portion of the activity. Examples could include procurement of light rail vehicles or ticket vending machines. The DFI entity is liable for the outcome of the project and is obligated to complete the project while meeting the specified contract price, completion schedule, and design or performance parameters. The advantages and disadvantages of this method are similar to those for DB.

Design-Build-Operate-Maintain (DBOM) is a project delivery method in which the owner procures design and construction services as in Design-Build delivery, as well as operations & maintenance services for a defined period, in the same contract from a single legal entity. Additional price and performance parameters for the operations & maintenance services are incorporated into the contract.

Private Funding Delivery Methods

Design-Build-Finance (DBF) is a project delivery method that combines the innovations of design-build with some amount of private sector capital (debt or equity). Often, this model will combine private sector funds with existing public sources, allowing private capital to fill any gaps in funding and enabling projects to be constructed faster.

Design-Build-Finance-Maintain (DBFM) is a project delivery method that is similar to DBF but also includes a short to medium term operational responsibility for the private partner. Unlike DBOM, however, the public sector retains the responsibility for operations.

Design-Build-Finance-Operate-Maintain (DBFOM) is a project delivery method that is similar to the DBOM approach, but the private partner is also responsible for financing and operations and maintenance is covered over the long-term. In this approach the private partner develops the asset – which is typically a toll road, managed lanes, or a transit facility – and enters into a long-term lease with the public sector that allows it to collect some or all project revenues over the contract term.

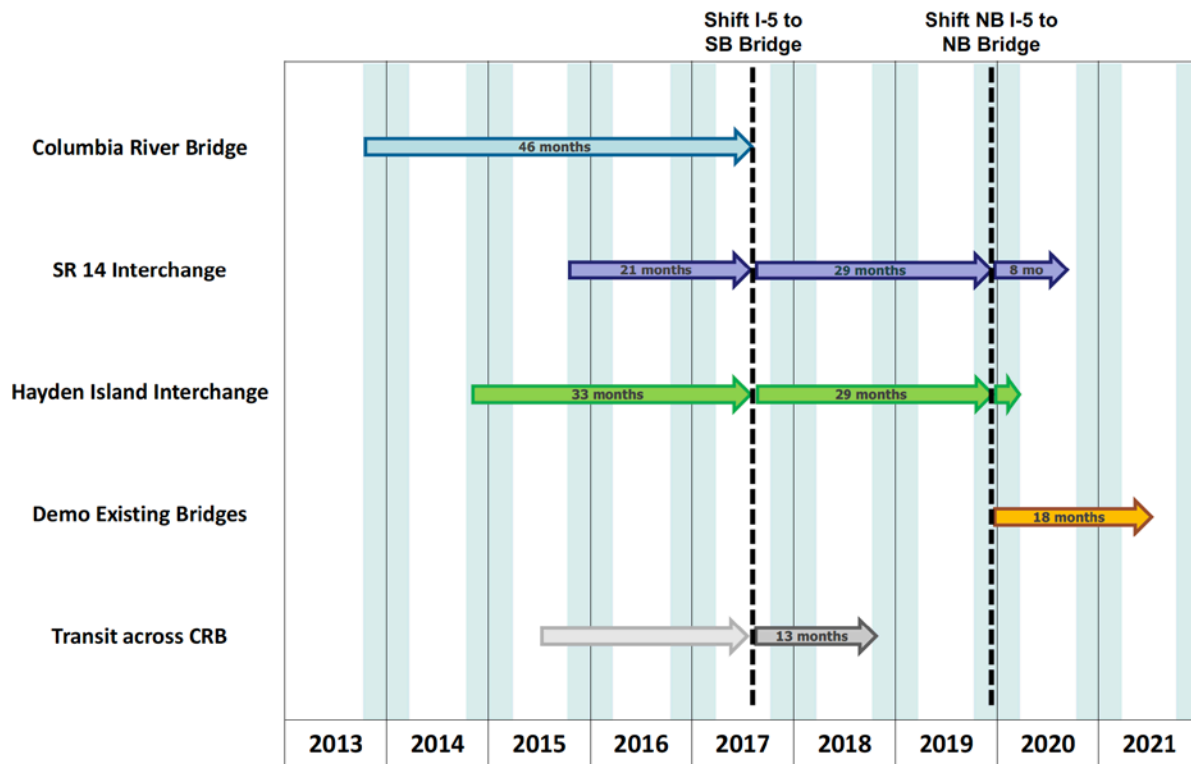
Build-Own-Operate (BOO) model represents the greatest transfer of responsibilities to the private partner. In this instance, the private partner develops and operates a new asset on land that it owns or controls.

Project Procurement Methods

Once a delivery method is chosen for a project, a procurement method must be chosen. Project procurement (contracting) methods refer to the procedures used to evaluate and select designers and contractors. The range of procurement methods includes those that are determined solely by price, solely on qualifications, as well as those based on a combination of clearly defined factors such as price, time, and technical qualifications. Procurements can be done in a single step or as a multi-step process.

Program Phasing, Sequencing and Packaging

The project delivery recommendations of the prior work were informed by program phasing, program sequencing, and construction packaging, as defined below.



Conceptual construction phasing schedule developed during enviromental review.

Program Phasing Phasing is the selection of project elements based on the program schedule and the anticipated availability of funding. In prior project planning, the Final Environmental Impact Statement (FEIS) defined the CRC Program as having two main phases: the Locally Preferred Alternative (LPA) Phase 1 and those elements delayed until later. These phases were identified to recognize economic conditions, funding and anticipated cash flow expected to be available for the program’s implementation. Program phasing prioritized the improvements that were considered most critical to meeting the project Purpose and Need, and the phasing considered the need to provide improvements with independent utility in each phase.

Program Sequencing Sequencing is ordering or arranging of program elements and a construction schedule that provides for reasonable efficiency of implementation; minimizes disruption to the transportation system by users and by those living and working in the affected area; and that fits with the cash flow constraints associated with agency budgets. Based on analyses of program sequencing options, the CRC project team developed the Initial Construction Program (ICP). The ICP was intended to implement the first elements of the overall program by focusing on those that improve mobility and maximize benefits to users and residents while meeting the financial constraints of agencies.

Construction packages Packages are discrete groupings of program elements likely to be issued as individual contracts. Project packages tend to have similarity of work (e.g., civil construction, structures, or transit components) or similar geographic or location attributes (e.g., Oregon or Washington), or interdependency of project elements (e.g., combining the main river crossing with the SR 14 interchange and Hayden Island with which it connects).

The project packaging strategy divided the CRC program into separate and distinct functional construction packages.

Key factors informing the program’s framework for project packaging include:

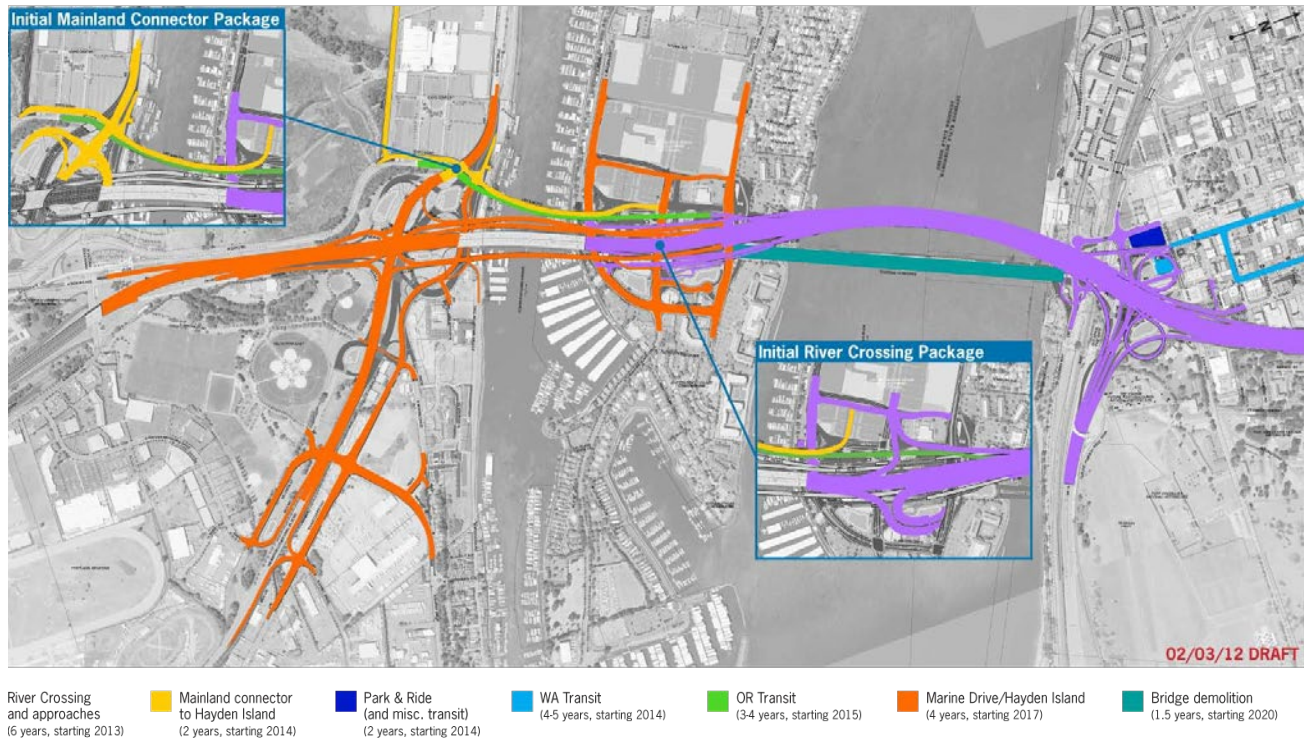
- A sequencing strategy;
- Interdependencies of project components;
- Jurisdictional changes and urban features along the alignment;
- Schedule criticality;
- Financial cash flow projection;
- Inherent risks;
- The level and complexity of oversight required for multiple interfaces among packages;
- Lead times;
- Specialty work; and
- Optimizing opportunities for competition and for participation by DBEs.

The packaging and delivery methods that were proposed are summarized in the following table:

Proposed Packaging Summary

| Package Title | Procuring Agency | Delivery Method |
|---|-------------------------|------------------------|
| River Crossing (RC) Package | WSDOT | DB |
| Columbia River Interstate Bridge Removal (BR) Package | WSDOT | DBB |
| Mainland Connector (MC) Package | ODOT or TriMet | DBB |
| Marine Drive (MD) Package | ODOT | DBB |
| Oregon Transit (OT) Package | TriMet | DBB |
| Washington Transit (WT) Package | WSDOT | DBB or GC/CM |
| Park-and-Ride (PR) Package | WSDOT | DB |
| Transit Systems (TS) Package | TriMet | DFI |
| Transit Other (TO) Package | | |
| Ruby Junction Maintenance Facility Modifications | TriMet | DBB |
| Steel Bridge Modifications | TriMet | DBB |
| Light Rail Vehicle Procurement | TriMet | DFI |
| Command Center Upgrades/Modification | TriMet | DFI |

Section 7: Project Delivery



The selection of contracting agency by package was based on the agencies’ experience and expertise, including TriMet’s successes in light rail transit delivery, ODOT’s bridge and highway delivery, such as the Oregon Transportation Investment Act (OTIA) program, and WSDOT’s experience in delivering large programs such as I-90, I-405, and the Alaskan Way Viaduct. Delivery methods associated with public-private partnerships were not considered because the project was pursuing public financing.

The rationale for the delivery method recommendation of each package was summarized in the PDPP as follows:

River Crossing (RC) Package DB was chosen to take advantage of potential time savings due to combining final design and construction, opportunities for innovation on construction sequencing and staging, risk transfer for the in-water work to the party with the best opportunity to mitigate, and overall construction time savings to release the bridge to subsequent transit construction, and open to tolling.

Columbia River Interstate Bridge Removal (BR) Package Consideration was given to include as part of the River Crossing Package or leave as a standalone project. Specific reasoning weighed the type of contractor to perform this work which is different than the RC package, even though some of the large equipment may be the same. Considering the cost of the removal, the timing of the removal, and the cash flow, recommended delivery method was DBB. The removal for the ends of the structures on land was to be included in the River Crossing Package to facilitate I-5 traffic switch to the new structures.



■ River Crossing and approaches (6 years, starting 2013)
 ■ Park & Ride (and misc. transit) (2 years, starting 2014)
 ■ WA Transit (4-5 years, starting 2014)
 ■ WA North (Mill Plain Blvd., Fourth Plain Blvd., 29th St., 33rd St., SR 500) (5 years, starting 2015)
 ■ Bridge demolition (1.5 years, starting 2020)

Mainland Connector (MC) Package Initially this package was identified as a good candidate for DB, due to potential for innovation and schedule advantages. This work is performed under a U.S. Army Corps of Engineers Section 408 levee permit, which requires advancing design to near 100 percent for all levee and near-levee zone impacts to successfully obtain a permit. With this advanced level of design, most advantages of DB—particularly opportunities for innovation—are lost, resulting in a recommendation of a DBB contract.

Oregon Transit (OT) Package Procurement options considered were GC/CM or DBB; ultimately DBB was recommended. DB was not considered due to reduced owner control over construction impacts. This package was identified as relatively straight forward without the typical coordination issues that would be expected if this were a densely developed downtown urban area. Advantages in coordination from GC/CM were viewed as minimal and the potential additional cost was not justified.

Washington Transit (WT) Package Procurement options considered were GC/CM or DBB. DB was not considered due to reduced owner control over construction impacts in this developed downtown area. Earlier work and discussions with city of Vancouver and C-TRAN had identified a preference for GC/CM due to advantages in the coordination of construction impacts. At the time of prior project planning, Washington State law limited prime contractor self-performed work to a maximum of 30 percent for GC/CM projects. This low percentage was not viewed as feasible for this project. The Legislature has subsequently created a GC/CM project category that increases the allowable percentage of self-performed work. The recommended procurement methods were GC/CM or DBB.

Washington Park-and-Rides (PR) Package DB was recommended as the delivery method for the three park-and-rides on the Washington side to take advantage of efficiency of design and schedule. The recommendations recognized flexibility for this package to be one, two, or three contracts depending on cash flow, and the potential to construct one or more facilities early as traffic mitigation if cash flow allowed.

Transit Systems (TS) Package The systems procurement recommendation was DFI. The successful proposer would complete the design concurrently with equipment selection, then procure, install and test the systems to ensure systems meet technical specifications. TriMet would solicit and select a contractor through a two-step procurement process: the first step establishes a list of qualified firms; the second step consists of evaluating and ranking the qualified proposals.

Transit Other (TO) Package Light Rail Vehicle Procurement Procurement was expected to occur using vehicle contract options that provided for an additional 19 vehicles to be procured at a fixed price and delivery schedule for the CRC program. These options have now expired.

Transit Other (TO) Package Ruby Junction Maintenance Facility Modifications, Central Control, and Steel Bridge Modifications Because of the time available, the owner control required and knowledge the owner has over these facilities, DBB was recommended for these packages.

Transit Signage and Graphics, and Owner Furnished Materials Mainline track, specialty track – these manufactured goods are commodities that are typically purchased through a competitive, low-bid procurement process.

Section 8:

Operations & Maintenance

Introduction

During prior project planning, the DOTs developed comprehensive *Operations & Maintenance* cost estimates for the proposed new infrastructure assets including:

- Annual highway facility costs;
- Annual, fixed toll collection costs;
- Variable toll collection costs (per transaction);
- Bridge insurance; and
- Annual transit O&M costs.

Additionally, the parties developed shared assumptions about ownership and operation of the bridge and transit facilities. The Final Environmental Impact Statement incorporated these cost, ownership and operation statements into a financial analysis; the major findings and assumptions of this analysis are summarized below.

Highway Operations and Maintenance Costs

The highway O&M cost of the new bridge was anticipated to consist of annual routine O&M costs and periodic rehabilitation and replacement (R&R) costs. Routine highway O&M costs were anticipated to consist of facility costs (i.e., the annual costs of operating and maintaining the roadway and bridges) and toll collection costs (i.e., the annual costs of collecting tolls and maintaining toll equipment).

Responsibility for conducting operations and maintenance between the state DOTs would have been addressed in an agreement between the parties in similar fashion to the existing agreement between the states regarding the Interstate Bridge. Currently, Oregon conducts the day-to-day operations and maintenance of the Interstate Bridge and is reimbursed for half of these costs by Washington. When tolling is conducted on a facility, it is important to have an integrated and comprehensive approach to operations and maintenance that includes activities specific to the facility, tolling infrastructure and the business of collecting tolls. During the previous project, WSDOT completed implementation of tolling on the Tacoma Narrows bridge and SR 520 and was developing other tolling projects. This experience and other national examples informed the development of tolling for the CRC Project.

Routine Annual Facility O&M Costs

Routine facility operations and maintenance generally includes such activities as regular crack sealing, cleaning, landscaping, sign repair, guardrail repair, pavement marking, snow removal, lighting, and other similar activities. The CRC Project developed a robust operations and maintenance plan to ensure that the facilities to be funded with toll-backed bonds would be well maintained, consistent with the assumptions of the investment grade analysis of toll revenues. Routine facility O&M costs for a high-volume section, such as the I-5 corridor, were estimated to cost \$1.2 million per year (in 2010 dollars). An additional \$72,000 per year was estimated to be required to operate and maintain the bridges. In addition, a high-quality incident response program was assumed for the new I-5 bridges to avoid unnecessary loss of toll revenue in the event of any significant issue that negatively affected congestion levels or throughput on the facility. This incident response program was estimated to cost \$660,000 per year in 2010 dollars.

Routine Annual Tolling O&M Costs

The prior project planned to incorporate an all-electronic toll collection system (ETC). With ETC, most toll collections would be through in-vehicle transponders linked to pre-paid accounts. An alternative payment method for users without transponders would employ a photographic license plate recognition system, sometimes referred to as a pay-by-plate system.

The annual O&M cost for toll collection consists of the fixed annual costs of tolling, the variable expenses of toll collection (assumed as a per transaction cost), and bridge insurance costs.

Variable tolling O&M costs include those expenditures for toll collection, customer service, and enforcement activities that vary with the number of transactions.

The financial analysis assumed that the new bridge structures would be insured for physical damage and for loss of toll revenues in the event the bridges could not be operated and tolls could not be collected for some period (i.e., business interruption insurance). The annual premium for such insurance was estimated to be \$1.7 million in 2010 dollars. The bridge insurance program, like the robust facility maintenance program, is intended to support the investment grade analysis and reduce the cost of borrowing against toll revenue by providing additional security for bond investors.

Highway/Tolling Periodic Rehabilitation and Replacement (R&R) Costs

Periodic R&R costs consist of facility costs and tolling costs. Highway periodic R&R primarily consists of roadway resurfacing and bridge inspection. No major capital replacement of a bridge element was anticipated during the term of the toll bonds for the prior project. Roadway resurfacing was estimated to cost about \$18.2 million (2010 dollars) and to occur every 15 years. Bridge inspection was expected to cost \$1.7 million (2010 dollars) and to occur every 5 years. For the first 30 years of operation, a total of \$46.4 million (in 2010 dollars) in facility R&R costs was anticipated.

Tolling periodic R&R consists of upgrading and replacement of toll collection equipment and software at the bridges and in the central system. Central system hardware was expected to be replaced every 5 years at a cost of \$3.6 million (in 2010 dollars) per replacement. The computer hardware on the bridges was expected to be replaced every seven years at a cost of about \$3.3 million (2010 dollars) per replacement. Toll collection system software was expected to be updated every seven years at \$1.3 million (2010 dollars) per update. For the first 30 years of operation, tolling R&R was expected to cost almost \$40.2 million (2010 dollars). Forecasting these periodic R&R costs and incorporating them into the net toll revenue analysis was another aspect of the tolling analysis that was designed to increase confidence and to minimize the cost of borrowing.

Transit Operations and Maintenance Costs

The bi-state governance of transit operations and maintenance was expected to be addressed through an agreement between C-TRAN and TriMet. An agreement was executed by C-TRAN and TriMet in September 2013 that addressed the operations and maintenance issues discussed here. The agreement left existing governing structures in place; established specific roles, responsibilities, and authorities for both parties; and required approval of significant O&M issues by both transit districts. The agreement included a decision-making process between the two transit districts regarding critical light rail operating policies such as headways, span of service, and anticipated annual O&M cost as part of the annual budget approvals required of both districts.

Under the bi-state transit operations agreement, TriMet was to provide light rail operators, light rail vehicle maintenance, and systems maintenance. These costs were to be allocated between the districts based on a sharing formula set forth in the bi-state agreement. Each district was to undertake and pay for all other operations and maintenance activities within its district boundaries. Park and ride maintenance, maintenance of way, and station security and maintenance within the C-TRAN district was to be performed and paid for by C-TRAN, and TriMet was to perform and pay for these activities in its district. Each district was to be responsible for marketing and public communications within its own district, although those efforts would generally be done in a coordinated and integrated manner.

Total corridor transit O&M costs for C-TRAN and TriMet in the year 2030 (in 2010 dollars) were estimated to be in the range of \$36 to \$37 million, including \$5 million per year in light rail O&M costs. Total estimated corridor costs included the cost of extending light rail service between the Expo Center station and the Clark College station, fixed-route bus service in the entire C-TRAN district, and TriMet's bus service in North Portland.

TriMet's 2030 corridor O&M costs for the LPA alternatives were projected to be \$0.75 million to \$1.75 million (2010 dollars) higher than those for the No-Build alternative, depending on the cost allocation formula used.

Compared to the No-Build Alternative, the LPA alternatives analyzed in the FEIS were projected to reduce C-TRAN's 2030 corridor O&M costs by \$0.35 million to \$1.35 million dollars (2010 dollars), because the reduction in bus operation costs made possible by the operation of light rail would have exceeded the added cost to C-TRAN of operating light rail. However, because the transit service assumptions of the FEIS included a significant increase in other transit service, such as feeder service to the proposed light rail stations in Vancouver, the proposed service plan represented an increase in C-TRAN's annual O&M costs of approximately \$3 million per year by 2030. The C-TRAN bus service underlying the O&M costs analyzed in the FEIS was expected to be sufficient to meet the demand forecast in the FEIS. C-TRAN had enacted a 20-year plan for expansion of transit service (both the additional service anticipated in the CRC FEIS, and other service improvements) and was considering a transit funding measure to be presented to voters within the C-TRAN service area.

The Federal Transit Administration provides formula-based funding for preventive maintenance, repair and replacement of Federally-supported transit assets, with annual funding provided after new assets have been in operation for seven years. Based on the funding formula for these Fixed Guideway Modernization funds, the FEIS analysis estimated that TriMet and C-TRAN would receive about \$300,000 annually for light rail transit extension. Unless otherwise needed for capital improvements or replacement, these funds would be available for preventive maintenance activities on the light rail extension to Clark College, reducing the shared O&M costs to be funded with C-TRAN and TriMet revenues.

Appendix A:

Guide to Key Documents Referenced in this Report

Documents referenced in this report are available on the website wsdot.wa.gov/accountability/ssb5806. Many of these documents are linked directly via hypertext within the report; these documents are also listed below by section, with their respective web addresses.

Section 2: Long-Range Planning <http://wsdot.wa.gov/accountability/ssb5806/Long-Range-Planning.htm>

Final Strategic Plan http://wsdot.wa.gov/accountability/ssb5806/docs/2_Long_Range_Planning/FinalStrategicPlan_with_attach.pdf

I-5 Trade Corridor Freight Feasibility and Needs Assessment http://wsdot.wa.gov/accountability/ssb5806/docs/2_Long_Range_Planning/I_5_TradeCorridorFreightFeasibilityandNeedsAssessment.pdf

Section 3: Context and Constraints <http://wsdot.wa.gov/accountability/ssb5806/Context-Constraints.htm>

Traffic Data: Files Included in Context Constraints: <http://wsdot.wa.gov/accountability/ssb5806/Context-Constraints.htm>

Problem Definition Final http://wsdot.wa.gov/accountability/ssb5806/docs/3_Context_Constraints/ProblemDefinitionFinal.pdf

Purpose and Need 01-17-06 http://wsdot.wa.gov/accountability/ssb5806/docs/3_Context_Constraints/Purpose_and_Need_01_17_06.pdf

TF Vision and Values http://wsdot.wa.gov/accountability/ssb5806/docs/3_Context_Constraints/TFVisionandValues.pdf

Cost of Congestion to Economy Portland Region http://wsdot.wa.gov/accountability/ssb5806/docs/3_Context_Constraints/CostofCongestiontoEconomyPortlandRegion.pdf

Section 4: Funding and Finance <http://wsdot.wa.gov/accountability/ssb5806/Finance.htm>

CRC Net Revenue Memo PB 12-27-2013 http://wsdot.wa.gov/accountability/ssb5806/docs/4_Finance/CRC_Net_Revenue_Memo_PB_12_27_2013.pdf

CRC Tolling Study Committee Report http://wsdot.wa.gov/accountability/ssb5806/docs/4_Finance/CRC_TollingStudyCommitteeReport.pdf

CRC Funding And Financing Options 11-28-06 http://wsdot.wa.gov/accountability/ssb5806/docs/4_Finance/CRCFundingAndFinancingOptions_112806.pdf

CRC Review of Economic Analysis http://wsdot.wa.gov/accountability/ssb5806/docs/4_Finance/CRCReviewofEconomicAnalysis.pdf

Interstate Tolling Agreement and Cover Letter http://wsdot.wa.gov/accountability/ssb5806/docs/4_Finance/InterstateTollingAgreementandCoverLetter.pdf

Investment Grade Analysis http://wsdot.wa.gov/accountability/ssb5806/docs/4_Finance/InvestmentGradeAnalysis.pdf

Jan 9 2014 CRC Letter to Legislative Leaders http://wsdot.wa.gov/accountability/ssb5806/docs/4_Finance/Jan_9_2014CRCLettertoLegislativeLeaders.pdf

Materials Tolling Study Committee http://wsdot.wa.gov/accountability/ssb5806/docs/4_Finance/Materials_TollingStudyCommittee.pdf

ODOT CRC Updates to Bonding Analysis 2013-12-13 FINAL http://wsdot.wa.gov/accountability/ssb5806/docs/4_Finance/ODOT_CRC_Updates_to_Bonding_Analysis_20131213FINAL.pdf

OR Treasurer CRC Financing Review http://wsdot.wa.gov/accountability/ssb5806/docs/4_Finance/OR_Treasurer_CRC_Financing_Review.pdf

Section 5: Project Management, Leadership and Coordination

<http://wsdot.wa.gov/accountability/ssb5806/project-management.htm>

Advisory Groups <http://wsdot.wa.gov/accountability/ssb5806/Advisory-Groups.htm>

PSC <http://wsdot.wa.gov/accountability/ssb5806/PSC.htm>

Task Force <http://wsdot.wa.gov/accountability/ssb5806/TaskForce.htm>

CRC Ownership Agreement Structure Analysis http://wsdot.wa.gov/accountability/ssb5806/docs/5_Project_Management/CRC_Ownership_Agreement_Structure_Analysis.pdf

Bi-State memo re decision process 7-19-07 http://wsdot.wa.gov/accountability/ssb5806/docs/5_Project_Management/Bi_State_memo_re_decision_process_7_19_07.pdf

CRC Mobility Council http://wsdot.wa.gov/accountability/ssb5806/docs/5_Project_Management/CRCMobilityCouncil.pdf

Deliver CRC Gov PR http://wsdot.wa.gov/accountability/ssb5806/docs/5_Project_Management/DeliverCRC_GovPR.pdf

Fact Sheet-Keeping The Economy Moving 05-17-13 http://wsdot.wa.gov/accountability/ssb5806/docs/5_Project_Management/FactSheet_KeepingTheEconomyMoving_051713.pdf

Governors Letter http://wsdot.wa.gov/accountability/ssb5806/docs/5_Project_Management/GovernorsLetter.pdf

Inter CEP Agreement http://wsdot.wa.gov/accountability/ssb5806/docs/5_Project_Management/InterCEPAgreement.pdf

Overview Interrelationship TF Products http://wsdot.wa.gov/accountability/ssb5806/docs/5_Project_Management/OverviewInterrelationshipTFProducts.pdf

PSC Final Report 09-13-10 http://wsdot.wa.gov/accountability/ssb5806/docs/5_Project_Management/PSC_Final_Report_091310.pdf

Summary of Advisory Groups and Working Groups http://wsdot.wa.gov/accountability/ssb5806/docs/5_Project_Management/SummaryofAdvisoryGroupsandWorkingGroups.pdf

Task Force Charter http://wsdot.wa.gov/accountability/ssb5806/docs/5_Project_Management/TaskForceCharter.pdf

Section 6: Project Development <http://wsdot.wa.gov/accountability/ssb5806/project-development.htm>

Alternative Development <http://wsdot.wa.gov/accountability/ssb5806/alternative-development.htm>

Conceptual Design and Preliminary Engineering <http://wsdot.wa.gov/accountability/ssb5806/conceptual-design-and-preliminary-engineering.htm>

Environmental Process and Permitting <http://wsdot.wa.gov/accountability/ssb5806/environmental-process-and-permitting.htm>

Biological Assessment Opinion <http://wsdot.wa.gov/accountability/ssb5806/biological-assesment-opinion.htm>

DEIS PDFs Files Included in Environmental process and permitting: <http://wsdot.wa.gov/accountability/ssb5806/environmental-process-and-permitting.htm>

FEIS PDFs Files Included in Environmental process and permitting: <http://wsdot.wa.gov/accountability/ssb5806/environmental-process-and-permitting.htm>

ROD PDFs Files Included in Environmental process and permitting: <http://wsdot.wa.gov/accountability/ssb5806/environmental-process-and-permitting.htm>

USCG Bridge Permit <http://wsdot.wa.gov/accountability/ssb5806/uscg-bridge-permit.htm>

CRC We Can't Wait Governors http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/Environmental_Process_And_Permitting/CRC_We_Cant_Wait_Governors.pdf

CRC Permit Table http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/Environmental_Process_And_Permitting/CRCPermitTable.pdf

Role Tribes and Agencies to CRC http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/Environmental_Process_And_Permitting/RoleTribesandAgenciestoCRC.pdf

We Can't Wait Designation http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/Environmental_Process_And_Permitting/We_Cant_Wait_Designation.pdf

External Review Validation <http://wsdot.wa.gov/accountability/ssb5806/external-review-validation.htm>

Bridge Review Panel Files Included in External Review Validation: <http://wsdot.wa.gov/accountability/ssb5806/external-review-validation.htm>

Independent Review Panel Files Included in External Review Validation: <http://wsdot.wa.gov/accountability/ssb5806/external-review-validation.htm>

CEVP Errata 08-26-10 http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/ExternalReviewValidation/CEVP_Errata_082610.pdf

Cost Risk Assessment Report http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/ExternalReviewValidation/Cost_Risk_Assessment_Report.pdf

CRC CEVP 08-17-11 http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/ExternalReviewValidation/CRC_CEVP_081711.pdf

Plaid Pantry Response http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/ExternalReviewValidation/PlaidPantry_Response.pdf

FTA New Starts <http://wsdot.wa.gov/accountability/ssb5806/ftanewstarts.htm>

2012 new starts update http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/FTANewStarts/2012_new_starts_update.pdf

2013-01-30 CRC FFGA Roadmap http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/FTANewStarts/2013_01_30_CRC_FFGA_Roadmap.pdf

CRBA Draft FFGA Drawing http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/FTANewStarts/CRBA_Draft_FFGA_Drawing.pdf

FTA PMOC Report 2013 01 25 http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/FTANewStarts/FTA_PMOC_Report_2013_01_25.pdf

LRT WalkingTour 01-20-09 http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/FTANewStarts/LRT_WalkingTour_012009.pdf

Transit_FactSheet http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/FTANewStarts/Transit_FactSheet.pdf

Van LRT_General Info http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/FTANewStarts/VanLRT_GeneralInfo.pdf

VDA_QA_01-03-13 http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/FTANewStarts/VDA_QA_010313.pdf

LPA <http://www.wsdot.wa.gov/accountability/ssb5806/lpa.htm>

06-24-08 TF MeetingSummary http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/LPA/062408_TF_MeetingSummary.pdf

CRC Task Force LPA Recommendation Resolution http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/LPA/CRC_TaskForceLPARecommendationResolution.pdf

I-5 CRC Architectural Standards http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/LPA/I5_CRC_Architectural_Standards.pdf

LPA Refinements http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/LPA/LPA_Refinements.pdf

Map HI LPA Concept D 08-02-10 http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/LPA/Map_HI_LPA_Concept_D_080210.pdf

PBAC DEIS LPA Memo 06-17-08 http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/LPA/PBAC_DEIS_LPA_Memo_061708.pdf

Preliminary Findings Memo http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/LPA/PreliminaryFindingsMemo.pdf

PSC MM 02-18-11 4 LPA Conditions http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/LPA/PSC_MM_021811_4_LPAConditions.pdf

Public Involvement <http://wsdot.wa.gov/accountability/ssb5806/public-involvement.htm>

Building Maintaining Safe Secure LRT http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/BuildingMaintainingSafeSecureLRT.pdf

Choices Handout http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/ChoicesHandout.pdf

Cost Estimates http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/CostEstimates.pdf

CRC Ped Bike Folio http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/CRC_Ped_Bike_Folio.pdf

CRC Recently Asked Questions http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/CRC_RecentlyAskedQuestions.pdf

CRC and Climate Change http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/CRCandClimateChange.pdf

CRC project FactSheet 04-28-08 http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/CRCprojectFactSheet_042808.pdf

CRC project Fact Sheet http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/CRCprojectFactSheet.pdf

CVEP http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/CVEP.pdf

Draft Recommendation Costs http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/Draft_Recommendation_Costs.pdf

Draft Recommendation Traffic Effects http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/Draft_Recommendation_Traffic_Effects.pdf

Draft EIS Comment Guide http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/DraftEISCommentGuide.pdf

Draft EIS guide http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/DraftEISguide.pdf

EJ Program http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/EJProgram.pdf

Environmental and Community Effects Scenarios http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/EnvironmentalandCommunityEffects_Scenarios.pdf

FEIS Folio http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/FEIS_Folio.pdf

Highway Interchanges Fact Sheet http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/HighwayInterchangesFactSheet.pdf

Keeping the Economy Moving http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/KeepingtheEconomyMoving.pdf

Mitigation Fact Sheet http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/MitigationFactSheet.pdf

NEPA Process http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/NEPAProcess.pdf

Pedestrian Bicycle Fact Sheet http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/PedestrianBicycleFactSheet.pdf

Project Background Fact Sheet http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/ProjectBackgroundFactSheet.pdf

Project Decision Points http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/ProjectDecisionPoints.pdf

Project Summary Fact Sheet http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/ProjectSummaryFactSheet.pdf

Project Summary Update April 2007 http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/ProjectSummaryUpdateApril2007.pdf

Project Timeline http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/ProjectTimeline.pdf

Property Purchases and Easements Fact Sheet 2 http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/PropertyPurchasesAndEasementsFactSheet_2.pdf

Property Purchases and Easements Fact Sheet http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/PropertyPurchasesandEasementsFactSheet.pdf

PSC Workshop Materials 06-11-10 http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/PSC_WorkshopMaterials_061110.pdf

Public Involvement http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/PublicInvolvement.pdf

Quick Guide http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/QuickGuide.pdf

River Navigation http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/RiverNavigation.pdf

Safety http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/Safety.pdf

Step A Screening http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/StepAScreening.pdf

Test Pile Fact Sheet http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/TestPile_FactSheet.pdf

Tolling http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/Tolling.pdf

Traffic Effects NB 8-10-12 scenarios http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/TrafficEffects_NB_8_10_12scenarios.pdf

Transit Fact Sheet http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/Transit_FactSheet.pdf

Transit Folio http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/Transit_Folio.pdf

Transit Folio http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/TransitFolio.pdf

Transit Markets 2020 http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/TransitMarkets2020.pdf

Transit Park and Rides http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/TransitParkandRides.pdf

Transportation Safety Fact Sheet http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/TransportationSafety_FactSheet.pdf

What Is NEPA http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/WhatIsNEPA.pdf

WSDOT CVEP 2011 http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/PublicInvolvement/WSDOT_CVEP_2011.pdf

Real Estate Acquisition Management Plan <http://wsdot.wa.gov/accountability/ssb5806/realestateacquisitionmanagementplan.htm>

5.12 APP F RAMP COMPLETE 05-01-13 http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/RealEstateAcquisitionManagementPlan/5_12_APP_F_RAMP_COMPLETE__050113.pdf

Graphic Timeline Origin Development http://wsdot.wa.gov/accountability/ssb5806/docs/6_Project_Development/Graphic_Timeline_OriginDevelopment.pdf

Section 7: Project Delivery <http://wsdot.wa.gov/accountability/ssb5806/project-delivery.htm>

CRC Project Delivery and Procurement Plan http://wsdot.wa.gov/accountability/ssb5806/docs/7_Project_Delivery/CRC_Project_Delivery_and_Procurement_Plan.pdf

Map Construction Packages 05-18-12 v7 plot http://wsdot.wa.gov/accountability/ssb5806/docs/7_Project_Delivery/Map_Construction_Packages_051812_v7_plot.pdf

P3 Final Report Jan 2012 Web http://wsdot.wa.gov/accountability/ssb5806/docs/7_Project_Delivery/P3FinalReport_Jan2012Web.pdf

Section 8: Operations & Maintenance <http://wsdot.wa.gov/accountability/ssb5806/operations-and-maintenance.htm>

1966-10-26 http://wsdot.wa.gov/accountability/ssb5806/docs/8_Operations_And_Maintenance/1966_10_26.pdf

1983-12-1205-Maintenance http://wsdot.wa.gov/accountability/ssb5806/docs/8_Operations_And_Maintenance/1983_12_1205_Maintenance.pdf

1986-11-20-I-5-Maintenance http://wsdot.wa.gov/accountability/ssb5806/docs/8_Operations_And_Maintenance/1986_11_20_I_5_Maintenance.pdf

CTRAN TRIMETIGA 9-26-13 http://wsdot.wa.gov/accountability/ssb5806/docs/8_Operations_And_Maintenance/CTRAN_TRIMETIGA_9_26_13.pdf

Appendix B:

List of Acronyms Used in this Report

#

- 14 State Route 14 / State Route 14 Interchange with I-5
- 4P Fourth Plain Boulevard / Fourth Plain Boulevard interchange with I-5
- 500 State Route 500 / State Route 500 interchange with I-5

B

- B Billion
- BIA Bridge Influence Area
- BNSF Burlington Northern Santa Fe Railroad
- BO Biological Opinion (regulatory agency response to biological assessment conducted by action agency)
- br. / Br bridge
- BR Bridge Removal Package
- BRP Bridge Review Panel
- BRT Bus Rapid Transit

C

- CEJG Community and Environmental Justice Group
- CEVP Cost Estimate Validation Process
- CFR Code of Federal Regulations
- CIG Capital Investment Grant
- CMAQ Congestion Management and Air Quality
- CN Construction
- COP City of Portland
- COV City of Vancouver
- CR Columbia River
- CRA Cost Risk Assessment
- CRBA Columbia River Bridge and Approaches (design-build procurement package)
- CRC Columbia River Crossing
- CRD Columbia River Datum (location specific adopted fixed low water reference plane)
- C-TRAN Clark County Public Transit Benefit Area Authority
- CWA Clean Water Act

D

| | |
|-------|--|
| DAHP | Washington State Department of Archaeology and Historic Preservation |
| DB | Design-Build |
| DBB | Design-Bid-Build |
| DBE | Disadvantaged Business Enterprise |
| DBF | Design-Build-Finance |
| DBFM | Design-Build-Finance-Maintain |
| DBFOM | Design-Build-Finance-Operate-Maintain |
| DBOM | Design-Build-Operate-Maintain |
| DEIS | Draft Environmental Impact Statement |
| DFI | Design-Furnish-Install |
| diam | diameter |
| DNR | Department of Natural Resources |
| DOT | Department of Transportation |

E

| | |
|-----|--------------------------------|
| EIS | Environmental Impact Statement |
| ESA | Endangered Species Act |

F

| | |
|----------|---|
| FAA | Federal Aviation Administration |
| FAST Act | Fixing America's Surface Transportation Act |
| FEIS | Final Environmental Impact Statement |
| FFY | Federal Fiscal Year |
| FHWA | Federal Highway Administration |
| FMO | Financial Management Oversight |
| FTA | Federal Transit Administration |
| FWG | Freight Working Group |
| FY | Fiscal Year |

G

| | |
|-------|---|
| GC/CM | General Contractor/Construction Manager |
| G.P. | General purpose [lane] |

H

| | |
|------|--------------------------------------|
| HAER | Historic American Engineering Record |
| HB | House Bill |
| HCT | High Capacity Transit |
| HI | Hayden Island |
| HOV | High-Occupancy Vehicle |

I

| | |
|----------|--|
| I-205 | Interstate 205 |
| I-405 | Interstate 405 |
| I-5 | Interstate 5 |
| I-84 | Interstate 84 |
| I/C | interchange |
| ICP | Initial Construction Program |
| InterCEP | Interstate Collaborative Environmental Process |
| IPS | Integrated Project Staff (support to Project Sponsors Council) |
| IRP | Independent Review Panel |

J

| | |
|-----|---|
| JTC | Washington State Joint Transportation Committee |
|-----|---|

L

| | |
|-----|-------------------------------|
| LPA | Locally Preferred Alternative |
| LRT | Light Rail Transit |

M

| | |
|--------|---|
| MAX | Light Rail Transit system in metropolitan Portland |
| MC | Mainland Connector Package |
| MD | Marine Drive / Marine Drive interchange with I-5 |
| Metro | Regional government for the Oregon portion of the Portland-Vancouver metro area |
| M.L. | Managed lane |
| MMPA | Marine Mammal Protection Act |
| M.O.S. | Minimum operable segment (refers to high capacity transit route extent) |
| MP | Mill Plain / Mill Plain interchange with I-5 |

N

| | |
|------|-----------------------------------|
| NB | northbound |
| NEPA | National Environmental Policy Act |
| NMFS | National Marine Fisheries Service |
| NPH | North Portland Harbor |

O

| | |
|--------|---|
| O&M | Operation and Maintenance |
| ODOT | Oregon Department of Transportation |
| ORSHPO | Oregon State Historic Preservation Office |
| OT | Oregon Transit Package |
| OTIA | Oregon Transportation Investment Act |

P

| | |
|------|---|
| P&N | Purpose and Need [statement] |
| P3 | Public-Private Partnership |
| PBAC | Pedestrian and Bicycle Advisory Committee |
| PDPP | Project Delivery and Procurement Plan |
| PMOC | Project Management Oversight Consultant |
| PNR | Park-and-Ride Package |
| PR | Park-and-Ride Package |
| PSC | Project Sponsors Council |
| PWG | Portland Working Group |

R

| | |
|------|---|
| R&R | Rehabilitation and Replacement |
| RAMP | Real Estate Acquisition Management Plan |
| RC | River Crossing Package |
| RCW | Revised Code of Washington |
| ROD | Record of Decision |
| ROW | Right-of-Way |

S

| | |
|--------------|--|
| SAFETEA-LU | Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users |
| SB | southbound |
| Section 106 | Section 106 of the National Historic Preservation Act |
| Section 4(f) | Section 4(f) of the Department of Transportation Act of 1966 |
| SMA | Shoreline Management Act |
| SR | State Route |
| SSB | Substitute Senate Bill |
| STHB | Stacked Transit Highway Bridge |
| STP | Surface Transportation Program |
| SWRTC | Southwest Washington Regional Transportation Council (regional government for the Washington portion of the Portland-Vancouver metro area) |

T

| | |
|--------|---|
| TDM | Transportation Demand Management |
| TF | Columbia River Crossing Task Force |
| TIFIA | Transportation Infrastructure Finance and Innovation Act |
| TO | Transit-Other Package |
| TriMet | Tri-County Metropolitan Transportation District of Oregon |
| TS | Transit Systems Package |
| TS&L | Type, Size and Location |
| TSM | Transportation System Management |

U

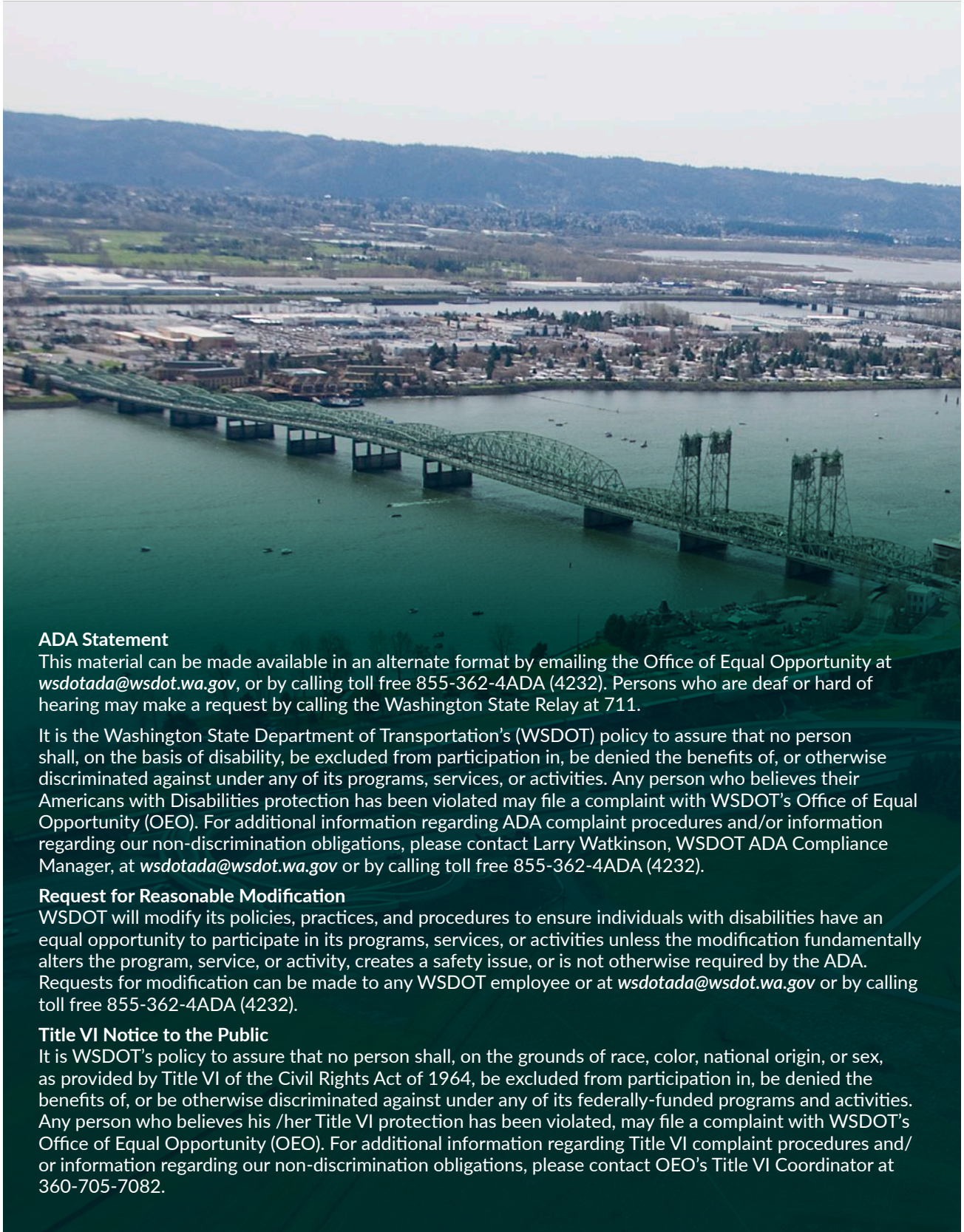
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|--------|---------------------------------------|
| U.S.C. | United States Code |
| UDAG | Urban Design Advisory Group |
| USACE | United States Army Corps of Engineers |
| USCG | United States Coast Guard |

V

| | |
|------|-------------------------------------|
| v.c. | vertical clearance |
| VE | Value Engineering |
| VMT | Vehicle Miles Travelled |
| VNHR | Vancouver National Historic Reserve |
| VWG | Vancouver Working Group |

W

| | |
|-------|---|
| WB | Wheel Base |
| WSDOT | Washington State Department of Transportation |
| WT | Washington Transit Package |



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