Columbia River CROSSING

June 8, 2007

TO: Linda Gehrke, Federal Transit Administration
Steve Saxton, Federal Highway Administration
Jeff Graham, Federal Highway Administration

FROM: Kris Strickler, CRC Deputy Project Director

COPY Doug Ficco, CRC Project Director
John Osborn, CRC Project Director
Heather Gundersen, CRC Environmental Manager

SUBJECT: Development of the Range of Alternatives

The purpose of this memorandum is to briefly summarize the process employed by the Columbia River Crossing (CRC) project team to develop the range of alternatives being evaluated in the Draft Environmental Impact Statement (DEIS), and to seek concurrence from Federal Transit Administration and Federal Highway Administration to proceed with this range of alternatives. This memorandum is a summary of the process used to develop the range of alternatives; however there are several attachments that are referenced throughout that provide additional details.

In 2001, Governors Gary Locke and John Kitzhaber established a bi-state task force of 28 community members, business representatives, and elected officials to address concerns about congestion on I-5 between Portland and Vancouver. This task force published a strategic plan in 2002 (see Attachment A) recommending substantial transportation improvements between I-405 in Portland and I-205 north of Vancouver. The CRC project was initiated in September 2005 to advance the recommendations of this planning effort. Since this time, CRC project staff has worked closely with the public, stakeholders, and local jurisdictions to develop, evaluate, and narrow a wide range of options to address this project's purpose and need.

In 2005, a combination of public scoping, stakeholder involvement, and project staff input developed the project's Purpose and Need (see Attachment B) and identified more than 70 potential options that could possibly satisfy it. These options were evaluated and screened by project staff during the first half of 2006 that resulted in a shorter list of promising transit and highway options. These options were then shared with outside stakeholders. Highway and transit options were then combined into 12 multi-modal alternatives that represented a reasonable range of transit and highway combinations to evaluate their performance. These 12 alternatives received extensive public and agency input and analysis. In November 2006, based on this input and analysis, project staff recommended advancing a range of alternatives to the DEIS that included two high capacity transit (HCT) modes—Light Rail Transit (LRT) and Bus Rapid Transit (BRT), and one river crossing alternative—replacement bridge (with design options of upriver or downriver). Subsequent public and stakeholder feedback revealed a desire by some stakeholders for a wider range of options to be evaluated in the DEIS, prompting the inclusion of supplemental bridge options in the range of alternatives. The range of alternatives currently being evaluated in the DEIS are as follows:

1. No Build
2. Replacement Bridge and BRT with complementary Express Bus service
3. Replacement Bridge and LRT with complementary Express Bus service
4. Supplemental Downstream Bridge and BRT with complementary Express Bus service
5. Supplemental Downstream Bridge and LRT with complementary Express Bus service

In addition, project staff will be evaluating a range of tolling options for the river crossing.

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Early Alternative Development and Screening

In October 2005, the CRC Task Force adopted a Vision and Values Statement (see Attachment C) that outlines broad goals and priorities for this project and served as a basis for developing criteria and performance measures to evaluate alternatives. In collaboration with local agency sponsors, the CRC Task Force[1], state and federal permitting agencies, and the project team developed the Evaluation Framework (see Attachment D). The Evaluation Framework outlines a process for narrowing a wide range of possible alternatives to a short list to be evaluated in the DEIS and ultimately to the selection of a preferred alternative. The first step in this process was to identify transportation components (i.e., river crossing types and transit modes) that could be packaged into alternatives. Over 70 such components were identified in the 2002 I-5 Transportation and Trade Partnership Final Strategic Plan and through public and stakeholder outreach.

After identifying components, project staff performed two rounds of evaluation and screening to narrow these options in preparation for packaging them into full alternatives. The initial screening effort in April 2006, "Step A" (see Attachment E), narrowed over 70 components using a pass/fail test to eliminate ideas that did not meet the purpose and need of the project. A second round of screening in June 2006, "Step B" (see Attachment F), evaluated the performance of the remaining components in relation to criteria specified in the Evaluation Framework. Components were scored on the following adopted values:

- Community livability and human resources
- Mobility, reliability, accessibility, congestion reduction, and efficiency
- Modal choice
- Safety
- Regional economy, freight mobility
- Stewardship of natural resources
- Distribution of benefits and impacts

Ultimately, all of the components that entered Step B screening remained. Step B screening did not highlight any clearly superior options or reveal any new fatal flaws, and many of the less significant weaknesses could likely be mitigated with design refinements.

The Task Force and general public participated in the Step A/Step B screening process through formal and informal comment and dialogue. The Task Force concurred with the results of the screening and the list of components brought forward for the next step.

Alternative Packages Development and Screening

The early screening efforts identified several promising options for further study. The best-performing river crossing options appeared to be a replacement bridge and a supplemental arterial or Interstate bridge. Express Bus, BRT, and LRT were the best performing transit modes. These components were packaged into 12 alternative packages. They were designed to assess how they perform generally, and to see how individual features 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 12 alternatives are listed below:

[1] The CRC Task Force is a 39-member stakeholder advisory group comprised of leaders from a broad cross section of southwest Washington and Portland, Oregon communities interested in the project. This group has representation from public agencies, businesses, civic organizations, neighborhoods, and freight, commuter and environmental groups.

	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

Note: 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

Project staff used the criteria outlined in the Evaluation Framework to assess the performance of each alternative. This assessment focused on the performance of river crossing types and transit modes. Other elements of alternatives, such as interchange configurations and transit alignments were used for modeling traffic and transit but were not individually screened. These elements would be later developed for alternatives assessed in the DEIS.

Overall, multi-modal packages performed the best. Alternatives that did not include a combination of both highway and transit improvements 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.

Analysis revealed (see Attachment G) that a replacement bridge performed best on nearly all criteria, and that BRT and LRT performed best for transit, particularly when paired with complementary Express Bus service. In November 2006, staff recommended (see Attachment H) 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 evaluation in the DEIS. The Task Force also recommended the project team undertake a substantial public involvement effort to gauge public opinion on the staff recommendation.

Development of the Range of Alternatives

In January 2007, staff launched an intensive public involvement effort to present the screening results and receive comments on the staff 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 is to place northbound I-5 traffic and bicycles and pedestrians on the existing bridges and include HCT and southbound I-5 traffic on a new supplemental crossing (see Attachment I for a description of the subcommittee process). The Task Force adopted the subcommittee's recommendation in March 2007.

Staff incorporated the March 2007 Task Force recommendation by including two more alternatives. Both alternatives would carry 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 differ in their HCT mode; the fourth alternative includes BRT on the new supplemental bridge and the fifth alternative includes LRT. This resulted in the following alternatives for evaluation in the DEIS:

1. *No Build*: This alternative includes 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 replace the existing I-5 bridges with a new crossing either upstream or downstream of the current I-5 alignment. This new crossing would carry Interstate traffic, BRT, and bicycles and pedestrians. Transit would include an all-day BRT system that would operate in an exclusive guideway from Vancouver to the Expo Center station where it would connect to the existing Yellow MAX Line. Express Bus service and local and feeder bus service would be increased to serve the added transit capacity.

3. *Replacement Bridge with LRT*: The same as the previous alternative except that LRT would be used as the HCT mode. LRT has the same alignment options, and similar station locations and requirements as those for the BRT alternative. Operational options, such as headways, would differ, and this system would integrate with the Yellow MAX Line without requiring transit patrons to transfer.

4. *Supplemental Bridge with BRT*: This alternative would use both existing I-5 bridges for northbound Interstate traffic and bicycles and pedestrians. A new crossing would carry southbound Interstate traffic and BRT. The existing I-5 bridges would be re-striped to provide two lanes on each bridge and allow for an outside safety shoulder for disabled vehicles. Three lanes would be for through traffic and one would be an auxiliary lane. Four southbound I-5 lanes and BRT would be provided on a new downstream supplemental bridge. The southbound lanes would include three through lanes and one auxiliary lane. Interchanges would 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 would be increased to serve the added transit capacity.

5. *Supplemental Bridge with LRT*: The same as the previous alternative except that LRT would be used as the HCT mode. LRT has the same alignment options, and similar station locations and requirements as the BRT alternative. Operational details, such as headways, may differ, and this system would integrate with the Yellow MAX Line without requiring transit patrons to transfer.

The DEIS will also evaluate the potential impacts and performance of a variety of tolling options.

Federal Concurrence

We appreciate your ongoing assistance and support with the Columbia River Crossing project. With this memorandum, we are seeking your concurrence on the range of alternatives being advanced into the DEIS, and the process that led up to those alternatives. If you have any questions or comments, please call Kris Strickler (360.816.2201) or Heather Gundersen (360.816.2199).

_____	_____	_____
Linda Gerkhe	Steve Saxton	Jeff Graham
FTA Deputy Administrator, Region 10	FHWA WA Area Engineer	FHWA OR Area Engineer

Columbia River CROSSING

Attachment A

Portland/Vancouver I-5 Transportation and Trade Partnership
Final Strategic Plan

Portland / Vancouver I-5 Transportation and Trade Partnership

Portland/Vancouver I-5 Transportation and Trade Partnership

Oregon Department of Transportation

Washington State Department of Transportation

Findings and Recommendations of the Governors Task Force

Final Strategic Plan

June 2002

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

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Rick Sant' Angelo, Board Member, Friends of Clark County

Elson Strahan, President, Clark College Foundation

Councilman Dan Tonkovich, City of Vancouver

Findings and Recommendations
of the Governors Task Force

Final Strategic Plan

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PART I: Background

PART II: Key Findings and Recommendations

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Part I

Background

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In 2001, Governors Gary Locke of Washington and John Kitzhaber of Oregon appointed a Task Force to address the growing congestion on Interstate 5 (I-5) in the metro areas of Vancouver (Washington) and Portland (Oregon). The 26 members of the I-5 Portland/Vancouver Transportation and Trade Partnership Task Force are listed on the inside front cover. The study area was defined as I-5 between the I-205 interchange in Washington and the I-84 interchange in Oregon and referred to as the I-5 Trade Corridor. The primary goals of the Task Force were to determine the level of investment needed in the corridor for highway, transit, and heavy rail improvements, and how to manage the transportation and land-use systems to protect investments.

The I-5 Trade Corridor.

The Task Force led an intense 18-month effort to develop a strategic plan to address the growing congestion. The process involved transportation experts, elected officials, representatives from business and industry, citizens' groups, and the public. The Final Strategic Plan is presented in this document.

The Plan is divided into two parts. **Part I** begins by explaining why I-5 is such an important transportation corridor in the region. Next, current and projected conditions in the region are described, followed by an explanation of the work that was done prior to the creation of the Task Force. Finally, the process that was used to develop the Plan is described.

Part II contains key findings and recommendations.

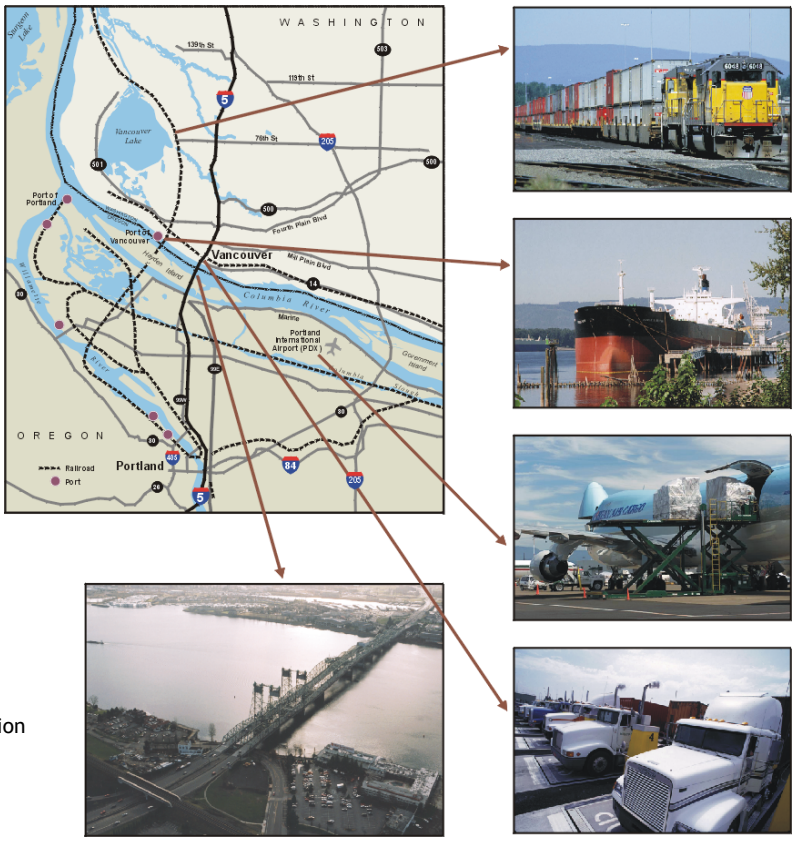
Nine attachments and a glossary provide additional information.

I-5 is the only continuous interstate on the West Coast, extending from Canada to Mexico.

The importance of I-5 to the region

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, two transcontinental rail lines, and much of the region's industrial land.

In 1997, 14 million tons of freight valued at $17 billion were shipped from the Oregon side of the metro area to locations in Washington. Shipments southbound from Washington into the Oregon side of the region totaled 28.5 million tons valued at $7.5 billion. Both the Ports of Portland and Vancouver and much of the Portland/Vancouver region's industrial land are within the I-5 Trade Corridor.



I-5 is vital to transportation and trade in the region.

For residents of the Portland/Vancouver area, the I-5 Columbia River Bridge is one of two crossings over the Columbia River for travel by transit or automobile. The bridge connects the communities of Portland and Vancouver for work, recreation, shopping and entertainment. An average of 125,000 trips are made across the I-5 bridge every day.

Existing and projected conditions

Regional growth and an increase in trade are driving the demand for more travel in the I-5 Trade Corridor. Comparing existing conditions in 2000 to those projected for 2020:

- the population of the Portland/Vancouver area will increase 39%, from 1.8 million to 2.5 million
- trade in the region is expected to increase 51%, from 293 million tons to 441 million tons
- daily traffic volume across the Interstate Bridge is expected to increase 44%, from 125,000 to 180,000
- traffic conditions will decline in the following ways unless improvements are made:
  - vehicle hours of delay during the evening peak period will increase 77%, from 18,000 hours to 32,000 hours
  - vehicle hours of delay on truck routes during the evening peak period will increase 93%, from 13,400 hours to 25,800 hours
  - transit travel times will double, from 27.3 minutes to 55 minutes

Initial approach to the problem

In 1999, a bi-state leadership committee considered the problem of growing congestion on the highway and rail systems in the I-5 Trade Corridor. 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 congestion 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, for example.
- *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 to fund the construction of the I-5 bridges.
- *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.*

Developing the Strategic Plan

The public was heavily involved in the development of the Strategic Plan. A Community Forum of interested stakeholders from both states was invited to provide input at each milestone, and there were six rounds of public meetings. A total of nearly 1,700 people participated. **Table 1** lists the Community Forum meetings and Open Houses that were held. Public involvement was encouraged in a variety of ways:

- advertisements in regional and local papers
- mailing list of 10,000 people
- E-mail address list of 2,000 people
- door-to-door delivery of project information to businesses, homes and apartments along the potential improvement corridors
- billboard advertisements
- bus advertisements
- project Web site, which has been accessed more than 400,000 times
- Web-based survey tools
- press releases
- public notices
- toll-free telephone number
- participation in community-based events such as neighborhood fairs
- soliciting speaking engagements with 275 business, community, and neighborhood groups
- presentations to more than 70 groups

Table 1. Overview of I-5 Partnership Task Force development process for the Strategic Plan.

			Community Forums and Open Houses		
Date	**Task**	**Activities**	**Date**	**Type of meeting**	**Subject**
Jan 2001 to May 2001	Visioning and development of options	• Development of a Problem, Vision and Values Statement • Identification of a wide range of ideas for the corridor • Development of evaluation criteria • Development and selection of a range of multi-modal Option Packages for the corridor to be evaluated	Jan 2001	Community Forum	Visioning /brainstorming
			Feb 2001	Open Houses	Visioning / brainstorming
			Apr 2001	Open Houses	Review of draft Option Package combos
			May 2001	Community Forum and Open Houses	Review of final draft Option Packages
June 2001 to Nov 2001	Evaluation of Option Packages/land use analysis	• Evaluation of Option Packages • Analysis of the land-use implications of making/not making transportation investments	Nov 2001	Community Forum and Open Houses	Review of evaluation results
Dec 2001 to Jan 2002	Development of draft recommendations	• Consideration of evaluation results and feedback from the public and Community Forum members to develop draft recommendations. Draft recommendations focused primarily on transit and highway investments for the I–5 Corridor	Jan 2002	Community Forum and Open Houses	Review of working draft recommendations
Feb 2002 to May 2002	Re-evaluation and development of additional draft recommendations	• Consideration of additional design and evaluation work in the Bridge Influence Area (SR 500 to Columbia Blvd) to assess the level of improvements needed in this section of the corridor and to develop new conceptual designs that had less community impact, particularly in Vancouver • Evaluation of the needs of the heavy rail system and commuter rail • Development of draft recommendations for Transportation Demand Management and Transportation System Management (TDM/TSM), Environmental Justice, Land Use, and Finance	May 2002	Community Forum and Open Houses	Review of additional work and additional draft recommendations
May 2002 to June 2002	Development of final recommendations	• Evaluation of results and feedback from the public and Community Forum members • Development of final recommendations for the I–5 Trade Corridor	June 2002	Open Houses	Review of final draft recommendations

The key components of the process to develop the Strategic Plan were:

- developing a Problem, Vision, and Values Statement
- developing multi-modal Option Packages
- evaluating the Option Packages
- developing recommendations

Table 1 describes the components in more detail.

Problem, Vision and Values Statement. The statement was based on input from the Community Forum and the public and is the foundation of the Strategic Plan.

> 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, further impacting the mobility, accessibility, livability and economic promise of the entire region.
>
> The Strategic Plan should be 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. When implemented, the Strategic Plan will improve the 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 result will protect our future with an improved and equitable balance of livability, mobility, access, public health, environmental stewardship, economic vitality and environmental justice.

Option Packages. Development of the Option Packages was based on input from the public and on the Problem, Vision and Values Statement. Five multi-modal Option Packages were selected for further analysis:

- Express Bus / 3 Lanes
- Light Rail / 3 Lanes
- Express Bus / 4 Lanes
- Light Rail / 4 Lanes
- West Arterial Road

All Option Packages included new river crossing capacity across the Columbia River for transit and vehicles, a substantial increase in basic transit service levels in Portland and Clark County, and the implementation of a strong transportation demand management program on both sides of the river. Maps of the Option Packages, with descriptions of the physical improvements and comparisons of transportation performance, are in **Attachment A**.

During the analysis, each Option Package was compared to three scenarios:

- Existing Conditions 2000— current conditions in the I-5 Trade Corridor
- No Build 2020—what is expected to happen in 2020 if the region builds only the currently funded projects
- Baseline 2020—what is expected to happen in 2020 if the region constructs the funded projects in the No Build 2020 scenario AND the other projects listed in the region's 20-year plans (see **Attachment A**)

After adopting draft recommendations in January 2002, the Task Force asked for additional evaluation and design work to be completed on the Bridge Influence Area, between SR 500 and Columbia Boulevard, and including light rail between the Expo Center and Downtown Vancouver. This focused examination of the bridge and its influence area resulted in the development of four river crossing concepts, which are shown in **Attachment B**.

The analysis for the Strategic Plan also focused on the needs of the freight and passenger rail system. This analysis was a cooperative effort among the owners of the rail system (Burlington Northern/Santa Fe and Union Pacific) and the users of the system (Amtrak, the states of Oregon and Washington, the Ports of Vancouver and Portland, and the cities of Portland and Vancouver). The rail analysis focused on an agreement among the parties about existing conditions, expected growth rates, short-term/incremental improvements to gain capacity and the long-term needs of the system.

Other areas of analysis and work that contributed to developing the key findings and recommendations are as follows.

- Metroscope, a new land use and transportation model, was used to analyze the implications of making or not making improvements in the I-5 Trade Corridor. The analysis compared two scenarios: doing nothing more than Baseline 202 improvements, and an improvement scenario similar to the Light Rail / 4 Lane Option Package.
- An analysis of commuter rail as a component of a multi-modal system between Portland and Vancouver was undertaken.
- Two work groups of community stakeholders, one in Oregon and one in Washington, were invited to help the Task Force develop key findings and recommendations in environmental justice. Ideas from these two work groups form the basis for much of the ongoing work that will need to be done in the Corridor to (1) identify, avoid and mitigate impacts from potential improvements, (2) ensure that benefits and impacts are equitably distributed, and (3) ensure that outreach efforts include meaningful involvement of low income and minority residents in the corridor.
- Three work groups of technical staff from Oregon and Washington agencies were brought together to assist the Task Force in developing key findings and recommendations in the Land Use Accord, Transportation Demand Management and Transportation System Management (TDM/TSM, and financing options and tools.

Within time and budget constraints, the analysis used the best travel-forecasting techniques and cost estimation methods available. However, the purpose of the analysis was to compare options. Although the cost estimates are fully appropriate for comparison of alternatives, they were based on "conceptual designs" that are not developed in sufficient detail for budgeting purposes. In addition, all costs are estimated as if the options were constructed in 2001 and use 2001 dollars. No finance costs are included. More detailed cost estimates will be prepared in the environmental impact statement (EIS) phase of the study and again for the projects selected for construction after preliminary engineering has been completed.

What's next

The Strategic Plan will be sent to the Oregon Transportation Commission, the Washington Department of Transportation, and the metropolitan planning organizations in Portland and Southwest Washington for review and potential adoption into their transportation plans. After adoption, the environmental review and project development phase may begin.

Before any improvements suggested in the Strategic Plan can be made, a formal environmental process must to be conducted under the requirements of the National Environmental Policy Act (NEPA). Part of the NEPA process is to determine the environmental and community impacts, if any, of proposed improvements and to develop mitigation plans for impacts that cannot be avoided. The process ensures that the public is heavily involved and that issues of environmental justice are thoroughly explored.

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Part II

Key Findings and Recommendations

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1 THE NEED FOR ACTION

1.1 KEY FINDINGS: Portland/Vancouver's unique trade and transportation advantage

1.1.1 The Portland/Vancouver area's location at the convergence of two major rivers, two transcontinental rail lines, two interstate highways, and one international airport is a unique trade and transportation advantage. This advantage allows companies to transport goods from ships and planes to trucks and rail cars in a low-cost, timely manner. The transportation facilities in the I-5 Trade Corridor are at the heart of this system.

1.1.2 Because of this advantage, Portland ranks first on the West Coast in terms of the value of wholesale trade per capita. Employment in the transportation and distribution sectors represents a higher share of total employment than it does in most other cities, including Seattle, Los Angeles, and Houston.

1.1.3 The critical mass of trade and transportation companies allows all businesses to benefit from "bulk" prices in the transportation industry that they would not enjoy in other, more populated regions.

1.1.4 More than 6,000 distribution and logistics companies employ more than 100,000 people in the metro area and pay them family wages. This accounts for 10% of the Region's workforce. The combined payroll for these sectors totals $4.7 billion—13% of the Region's total $36 billion annual payroll.

1.1.5 Of the freight moving in the Portland/Vancouver metro area, the majority (64%), is carried by truck. The remainder is carried by a variety of modes including pipeline (10.8%), ocean (9.7%), rail (5.6%), barge (5.4%), intermodal (4.5%), and air (0.1%).

1.2 KEY FINDINGS: Projected growth

1.2.1 Projected regional growth and an increase in trade are driving the demand for more travel in the I-5 Trade Corridor. Today the Portland/Vancouver area's population is about 1.7 million. By 2020, the population is expected to increase to 2.4 million. Likewise, the amount of trade in the Region is expected to increase from 168 million tons in 1996 to 275 million tons in 2020.

1.2.2 The I-5 Trade Corridor will experience significant growth in truck traffic over the next 20 years. Compared to Existing Conditions 2000, conditions will decline under the No Build 2020 scenario. Vehicle hours of delay on truck routes will increase by 93%, congested lane-miles on truck routes will increase by 58%, and the value of truck delay will increase by 140%.

1.3 KEY FINDINGS: Freeway system

1.3.1 Over 10,000 trucks are in the I-5 Trade Corridor every day carrying goods ranging from auto parts and furniture to fruit juice and clothing. Half of the goods the trucks carry are from or bound for Portland. The value of these shipments is more than $26 billion a year. The value of these shipments is equivalent to one third of the metro area's gross product.

1.3.2 Freeway conditions will decline in the future. As a result of growth, daily traffic demand volumes on I-5 are expected to increase 44%, from 125,000 in 2000 to 180,000 by 2020. Without transportation improvements in the Corridor, there will be a significant impact on travel time, delay and congestion.

1.3.3 Under the No Build 2020 scenario during the evening peak period:*

- Vehicle travel times between Downtown Portland and Salmon Creek will increase 22%, from 38 minutes in 2000 to 44 minutes in 2020.
- Vehicle hours of delay on all routes in the study area will increase 77%, from 18,000 hours in 2000 to 32,000 hours in 2020.
- Congested lane miles on I-5 and I-205 will increase 40%, from 24% in 2000 to 33.7% in 2001.
- The value of truck delay in the study area will increase 140%, from $14.1 million in 2000 to $34 million in 2020.
- Vehicle hours of delay on truck routes in the study area will increase 92%, from 13,390 hours in 2000 to 25,767 hours in 2020.

1.3.4 Baseline 2020 improves these measures of transportation performance, but conditions remain worse than today. Comparing Baseline 2020 with today's conditions during the evening peak period:

- Vehicle travel times will increase 5%, from 38 minutes in 2000 to 40 minutes in 2020.
- Vehicle hours of delay for all routes in the study area will increase 18%, from 18,000 hours in 2000 to 21,477 hours in 2020.
- Congested lane miles on I-5 and I-205 will increase 26%, from 24% in 2000 to 30.4% in 2020.
- The value of truck delay in the study area will increase 88%, from $14.1 million in 2000 to $26.5 million in 2020.
- Vehicle hours of delay on truck routes in the study area will increase 28%, from 13,390 hours in 2000 to 17,088 hours in 2020.

1.4 KEY FINDINGS: Transit system

1.4.1 Compared to Existing Conditions 2000, transit conditions will decline in the future under the No Build 2020 scenario. Travel times in the I-5 Trade Corridor will double, from 27.3 minutes

* See **Attachment A** for graphs of some of the transportation findings.

in 2000 to 55 minutes in 2020. This increase results from the fact that transit riders will face a transfer from MAX to the bus system at the Expo Center and buses will encounter congestion at the freeway on-ramps and across the bridge. Due to the increase in travel time, the number of people using transit in the I-5 Trade Corridor from Downtown Vancouver will decline from 5.6% in 2000 to 4.9% in 2020, and the operating cost of maintaining current levels of bus service will increase significantly due to longer travel times.

1.4.2 Baseline 2020 improves transit travel times due to increased overall transit service in the Region, but travel times remain significantly higher than today (27 minutes today; 41 minutes in 2020). The operating cost to maintain the same level of bus service will likely increase proportionately with the travel time increase.

1.5 KEY FINDINGS: Heavy rail system

1.5.1 Healthy and viable rail service in the I-5 Trade Corridor is a critical component of the regional economy. It is an integral part of the Region's comparative advantage in providing an intermodal focus of marine, barge, highway, and rail services that contributes to the Portland/Vancouver area's recognition as a major national and international trade and distribution center.

1.5.2 The Region contains five major rail yards and numerous smaller yards and port terminals. The Region's rail system serves the states' largest collection of industrial customers and accesses a major, deep draft, ocean port. Intercity passenger service (Amtrak/Cascades) operates over private railroad tracks. The two transcontinental railroads (BNSF and UP) along with Amtrak operate over the BNSF Columbia River Rail Bridge.

1.5.3 Currently, 63 freight trains and 10 Amtrak trains per day cross the BNSF Bridge, not including local switching operations. Freight trains are projected to reach 90 per day in 20 years and long-range, intercity passenger service plans call for 26 trains per day. Congestion on the Region's rail system is approximately 100 hours of accumulated delay per day, which is roughly 50% of the delay experienced in Chicago or Los Angeles. Relatively speaking, there are fewer trains experiencing more delay on our system.

1.5.4 Congestion in the Portland/ Vancouver rail network presents a constraint on the viability of the Region's continued economic growth.

1.5.5 Congestion in the rail network further constrains the opportunity for enhanced intercity passenger rail and commuter rail service along this segment of the federally designated Pacific Northwest High Speed Rail Corridor.

1.5.6 The capacity of the Portland-Vancouver rail network is not sufficient to meet current or future freight and intercity passenger needs. There is insufficient capacity to support development of the Ports of Portland and Vancouver. There will not be capacity to support increased intercity passenger service from Eugene to Portland/Vancouver to Seattle.

1.6 KEY FINDINGS: Overall

1.6.1 In the absence of both freeway and transit investment in the I-5 Trade Corridor, congestion and delay will grow steadily, resulting in the AM and PM periods of congestion spreading into the early morning, midday, and evening hours.

1.6.2 Rush hour congestion is a fact of life in an urban area and is to be expected and tolerated to some degree. However, unpredictable delays and congestion throughout the day cannot be tolerated without an adverse impact on the Portland/Vancouver Region's economy and quality of life.

1.6.3 Future delays in the I-5 Trade Corridor could impact the economy in the following ways:

- Freight and trade will incur additional cost from congestion, especially during the midday.
- The lack of reliability will increase transportation costs more than the increases in delay.
- Increases in cost and uncertainty will influence business location and expansion decisions.
- The lack of accessibility will limit the ability to attract future jobs in key industrial areas such as the Columbia Corridor.

1.6.4 Congestion on the rail system threatens the Region's status as the Pacific Coast's low-cost rail port and puts rail companies and their regional customers at a disadvantage relative to other regions. It also threatens our plans to expand intercity passenger rail service between Oregon and Washington.

1.6.5 The problems in the I-5 Trade Corridor cannot be solved with freeway improvements alone. A high quality bi-state transit system is needed to provide an alternative to driving that provides an improvement in transit travel times and reliable service throughout the day.

1.6.6 The problems in the I-5 Trade Corridor cannot be solved with transit, land use, and demand management actions alone. Additional capacity will need to be added to the road system to ensure that today's accessibility and reliability can be maintained and improved.

RECOMMENDATION 1: The need for action

R 1.1 Physical improvements in the I-5 Trade Corridor beyond the Baseline 2020 projects are warranted and necessary to meet the transportation, economic, and livability needs of the Portland/Vancouver Region.

2 ADDITIONAL TRANSIT CAPACITY AND SERVICE

2.1 KEY FINDINGS: Transportation performance

2.1.1 The Express Bus–Long and the Light Rail Loop Option Packages significantly improve travel times compared to Baseline 2020, and slightly improve travel times compared to today.

2.1.2 The Express Bus–Short Option Packages provides a slight improvement to travel times compared to Baseline 2020, but when compared to existing transit travel times, transit trips can be expected to be approximately 9 minutes longer than they are today.

2.1.3 Transit ridership across the Columbia River (I-5 and I-205 Corridors) is expected to increase under all transit options, with the greatest increase resulting from the Light Rail Loop. Compared to Baseline 2020, Express Bus–Short increases ridership by 38%, Express Bus–Long increases ridership by 63%, and Light Rail Loop increases ridership by 94%.

2.1.4 The Light Rail Loop provides the most consistent travel time and the best reliability of the transit options considered because it runs in its own right of way and is not impeded by roadway congestion.

2.2 KEY FINDINGS: Environmental and community impacts

2.2.1 There could be impacts to historic resources for all transit options, but most of the impacts to historic resources appear to either be indirect or minor.

2.2.2 All transit options are likely to have a moderate impact on fish habitat, due to the fact that they involve new bridges that could have in-stream piers potentially affecting rearing or migration habitat.

2.2.3 Because the improvement area in the I-5 Trade Corridor is highly urbanized, impacts to wildlife habitat, wetlands and native plant communities are likely to be minor for the highway improvements needed to support the Express Bus Option Packages.

2.2.4 For light rail, the I-5 and I-205 segments would have minor impacts to wildlife, wetlands and plant communities. The current concept for the east/west segment could have moderate impacts to natural areas. Actual impacts for each of the segments would depend on the final alignment.

2.2.5 While it is not possible to make the transportation improvements considered in this planning effort without some level of impact to existing properties, the impacts to properties are highly dependent on the design and alignment of the projects.

2.2.6 For freeway improvements in the I-5 Trade Corridor that are needed to support Express Bus, the greatest potential for impacts to property is on Hayden Island.

2.2.7 For the light rail loop, the I-5 and I-205 segments would have few displacements. As studied for this planning effort, it appears that there is a greater potential for property impacts on the east/west segment of the light rail loop. Refinement of various alignment options could reduce or avoid many of these impacts.

2.3 KEY FINDINGS: Cost

2.3.1 Express bus is the lowest cost of transit options due to the fact that it operates on the highway in an already established right of way (Express Bus–Short = $14 million and for Express Bus–Long = $32 million [in 2001 dollars]).

2.3.2 Light rail is the highest cost of the transit options due to the fact that it operates in its own right-of-way with a track system ($1.222 billion [in 2001 dollars]).

2.3.3 The actual costs will vary depending on final design, mitigation, inflation and other factors.

2.4 KEY FINDINGS: Other

2.4.1 Compared to light rail, buses have the following advantages:

- Buses can be flexibly routed to serve different origins and destinations, and to address particular traffic congestion problems.
- Buses can more effectively serve outlying population centers such as Battle Ground and Ridgefield.
- Buses can be readily placed on new routes.

2.4.2 Compared to light rail, express buses serve a more limited transportation market. As evaluated, express bus was a point-to-point system that served the commuter market and ran Monday through Friday in the morning and evening peak periods only.

2.4.3 Compared to express bus, light rail has the following advantages:

- Does the most to promote balanced (multi-modal) use of the system—transit ridership in downtown Vancouver increases by 40 to 50% with light rail, compared with 8 to 10% for express bus.
- Serves a range of trip purposes throughout the day, seven days a week.
- Provides consistent service to multiple points along the line and can be a catalyst for community redevelopment.
- Is consistent with regional and local goals, and reinforces the Vancouver and Portland Central cities and regional centers such as Vancouver Mall and Gateway.

2.4.4 Across all measures, I-5 performs better when paired with light rail than with the express bus packages that were tested because light rail attracts more riders.

RECOMMENDATION 2: Additional transit capacity and service

R 2.1 A light rail loop system, including feeder buses, and new and expanded park and ride lots, should be established in Clark County. In the interim, bi-state transit needs will continue to be served by express bus.

R 2.2 The light rail loop system should provide transit mobility, both within Clark County and between Washington and Oregon, in the I-5 and I-205 Corridors

R 2.3 The light rail loop system may be constructed in phases.

R 2.4 Peak-hour, premium express bus service in the I-5 and I-205 Corridors to markets not well served by light rail may be provided as a supplemental service to light rail.

R 2.5 Transit service in the Corridor should be increased over the next 20 years as planned in the Metro and RTC 20-year transportation plans.

3 ADDITIONAL FREEWAY CAPACITY

3.1 KEY FINDINGS: Fixing two-lane sections

3.1.1 There are three remaining two-lane sections on I-5 in the study area: (1) I-84 – Fremont Bridge near the Rose Quarter, (2) Delta Park to Lombard, and (3) 99th Street to I-205 in Clark County.

3.1.2 Widening these two-lane sections to three lanes, combined with an overall improvement in transit service throughout the Portland/Vancouver Region as called for in Baseline 2020, allows freeway travel times though the Corridor to remain about the same as they are today.

3.1.3 An environmental impact statement (EIS) has been completed for the project to widen I-5 to three lanes in each direction between 99th Street to I-205 in Clark County. This project is ready for construction and awaits funding.

3.1.4 An environmental assessment is currently underway for the project to widen I-5 to three lanes in each direction between Delta Park and Lombard. The environmental impacts of this project (air quality, natural resources, property impacts) are not expected to be significant.

3.1.5 At Columbia Boulevard in Portland, the on-ramp currently joins the freeway to become the third lane on the freeway, thus providing ease of entry to the freeway for trucks. With the widening to three lanes, the Columbia Boulevard on-ramp would become a merge lane. Analysis shows that we can expect the reconfigured on-ramp merge from Columbia Boulevard to operate acceptably with this improvement. The existing ramp has a rising grade of 6% and enables heavy trucks to attain a speed of only 25 mph when entering the freeway. The proposed ramp would have a 4% grade and a 1,400-foot acceleration lane, enabling trucks to attain a speed of

45 mph within the acceleration lane before entering the freeway. The new on-ramp would operate at a Level-of-Service "C-D" during the peak periods, which indicates generally smooth merging conditions.

3.1.6 Widening I-5 to three 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.

3.1.7 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.

RECOMMENDATION 3a: Fixing two-lane sections

R 3a.1 I-5 should be widened to three lanes in each direction between (a) Delta Park and Lombard and (b) 99th Street and I-205 in Clark County

R 3a.2 The Delta Park to Lombard project should go to construction as quickly as possible.

R 3a.3 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.

3.2 KEY FINDINGS: Overall freeway improvements

3.2.1 Two central questions for this planning effort have been:

- Should the freeway be three through-lanes in each direction between I-84 in Portland and I-205 in Clark County, or it should be expanded to four through-lanes in each direction?
- Should there be new river crossing capacity for vehicles?

3.2.2 The current configuration of interchanges close to the existing Interstate Bridges results in operational problems that make the six-lane bridge function more like a four-lane bridge. This results in significant congestion and delay during the morning and evening peak periods. All Option Packages for making the freeway three lanes or for expanding it to four lanes assumed an additional or new bridge in the I-5 Trade Corridor to address the problems with the existing bridges.

3.2.3 Compared to Baseline 2020, both the three-lane and four-lane options significantly improve travel times in the Corridor.

- During the evening peak periods, the Baseline 2020 travel time between Downtown Portland and Downtown Vancouver for autos and trucks is 30 minutes. Under the three-lane options, travel times are reduced by about 9 minutes; under the four-lane option, travel time is reduced by 12 minutes.

- During the evening peak periods, travelers will experience about 21,450 hours of delay. Under the three-lane options, vehicle hours of delay are reduced by between 22 and 26% to approximately 16,000 hours of delay. Under the four-lane option, delay is reduced by 26%, also about 16,000 hours of delay.

3.2.4 Improved travel times and reduced delay observed in the three-lane and four-lane Option Packages are primarily attributable to the new capacity across the Columbia River in the I-5 Trade Corridor.

3.2.5 If the four lanes are configured as a reversible express lane system (five lanes in the peak direction and three lanes in the non-peak direction), additional transportation performance benefits can result. Time travel savings increase by an additional 10 minutes and delay is reduced by an additional 13% to approximately 13,000 hours of delay.

3.2.6 Options that add a fourth lane to the freeway in each direction have the potential to significantly impact traffic operations on the Portland freeway loop. The four-lane options would increase southbound traffic volumes on I-405 by 9–12%, from 18,293 vehicles under 2020 Baseline to 20,000–25,000 vehicles under the four-lane options. Near the Rose Quarter, traffic volumes would increase by 15–30%, from 12,525 vehicles under 2020 Baseline to 14,361–16,351 vehicles under the four-lane options. The higher traffic volumes would be observed if the fourth lane were added as a reversible express lane.

3.2.7 Options that limit the freeway to three lanes in each direction would increase southbound volumes on I-405 by less than 1% compared to Baseline 2020, and would increase southbound volumes on I-5 near the Rose Quarter by 5–7%, also compared to Baseline 2020.

3.2.8 I-5 is the most direct route for the majority of trips across the Columbia River due to the high number of employment and other activity centers that are served by I-5. With a new river crossing, people have a better ability to choose the shortest and most direct path for their trip.

3.2.9 With the improvements on I-5, volumes on the I-205 Bridge decrease because some trips that now occur on I-205 would shift to I-5. This would allow the I-205 Bridge to better serve future planned growth in the I-205 Corridor.

3.3 KEY FINDINGS: Environmental and community impacts

3.3.1 Historic

- There could be impacts to historic resources for both the three-lane and the four-lane options, but most of the impacts to historic resources appear to either be indirect or minor.
- Expanding the freeway to four lanes in each direction results in the potential for one major impact to one historic property owned by Multnomah County.
- A replacement bridge would involve a full impact on the Columbia River Bridges. The existing northbound bridge is listed on the National Register of Historic Places and the southbound bridge is eligible for listing.

3.3.2 Natural resources

- Both the three-lane and four-lane options would have a moderate impact on fish habitat, because they involve new bridges that could have in-stream piers that would potentially effecting rearing or migration habitat.
- Because the improvement area in the I-5 Trade Corridor is highly urbanized, impacts to wildlife habitat, wetlands and native plant communities are likely to be minor for the Baseline 2020, three-lane and four-lane options.

3.3.3 Property impacts

- While it is not possible to make the transportation improvements considered in this planning effort without some level of impact to existing properties, these impacts are highly dependent on the design and alignment of the projects.
- For improvements in the I-5 Trade Corridor, the greatest potential for impacts to property is on Hayden Island. A replacement bridge has the least number of impacts due to the fact that it follows near the existing bridge and freeway alignment. In Washington, the design of freeway interchange improvements between SR 14 and SR 500 can greatly influence property displacements and impacts. Interchange improvements in Washington can be designed to minimize the number of property impacts.

3.3.4 Air quality

- In the future, air quality is expected to be considerably better than it is today for carbon monoxide (CO), volatile organic compound (VOC) and nitrogen oxides (NOx). This is due primarily to cleaner burning fuels and lower emission vehicles. Comparing Existing Conditions 2000 to Baseline 2020, CO = 30% reduction, VOC = 73% reduction, and NOx = 85% reduction.
- While air quality is expected to improve, the three-lane and the four-lane options have the potential to increase CO, VOC, and NOx emissions when compared to Baseline 2020.
- Based on the analysis completed to date, the differences among Option Packages regarding air quality are relatively small. Adding a fourth lane to the freeway appears to have the most impact on air quality, compared to other options.
- Air quality impacts are a concern that has been raised by advocates and community members alike. Additional examination of air quality impacts is warranted.

3.4 KEY FINDINGS: Cost

3.4.1 As conceptualized, preliminary cost estimates for the freeway options in 2001 dollars are:

- Three-lane = $1 billion (includes costs for interchange improvements between SR 500 and Lombard, and new river crossing capacity)
- Four-lane = $1.6 billion

3.4.2 The actual costs will vary depending on the final design, mitigation, inflation and other factors.

RECOMMENDATION 3b: Overall freeway capacity

R 3b.1 The Task Force recommends that the I-5 freeway between the Fremont Bridge in Portland and the I-205 interchange in Vancouver be a maximum of three through-lanes in each direction.

R 3b.2 The Task Force considered expanding the capacity of the Corridor to four through-lanes in each direction but does not recommend this option.

3.5 KEY FINDINGS: High occupancy vehicle (HOV) lanes

3.5.1 Provision of new river crossing capacity makes a continuous HOV system between Portland and Vancouver a possibility.

3.5.2 HOV performance is highly dependent upon the design of the new freeway system. Current design concepts require changes to better accommodate the HOV system. In some cases the bridge design affects HOV performance. For example, multiple bridges split freeway traffic and would limit HOV access. In addition, direct access ramps will need to be considered at key locations such as SR 500.

RECOMMENDATION 3c: High occupancy vehicle (HOV) lanes

R 3c.1 Further exploration of HOV in the EIS is required to optimize the design of the system and to determine its overall effectiveness.

R 3c.2 One of the three through-lanes should be designated for use as a high occupancy vehicle (HOV) lane during the peak period, in the peak direction. Further exploration is required in the environmental impact statement to optimize its design, particularly within the Bridge Influence Area, and to determine its overall effectiveness in meeting the regional objectives for the I-5 Trade Corridor.

3.6 KEY FINDINGS: Columbia Boulevard Interchange

3.6.1 Making Columbia Boulevard into a full access interchange will provide a direct connection to I-5 for one of the Region's busiest freight routes. It will reduce congestion at the Marine Drive interchange, improve truck utilization of Columbia Boulevard, and reduce traffic in the Kenton neighborhood.

3.6.2 Design of this interchange needs to be done in conjunction with the design of the entire Bridge Influence Area to ensure overall system functionality.

RECOMMENDATION 3d: Columbia Boulevard interchanges

R 3d.1 The Columbia Boulevard interchange in Oregon should be made into a full interchange (add ramps for southbound traffic to exit at Columbia Boulevard and for northbound traffic to enter the freeway from Columbia Boulevard).

R 3d.2 Both the Delta Park to Lombard project and the Columbia Boulevard interchange project should be considered for design at the same time. As part of this design effort, there needs to be a phasing and financing plan, with the recognition that the Delta Park project is the first priority.

4 BRIDGE AND BRIDGE INFLUENCE AREA (SR 500 TO COLUMBIA BLVD)

4.1 KEY FINDINGS: Freight mobility and the economy

4.1.1 According to USDOT's Freight Analysis Framework, the I-5 Trade Corridor carries the highest volume of freight in the states of Oregon and Washington. It is the key route for freight originating or destined for Portland and Seattle.

4.1.2 USDOT's Freight Analysis Framework also shows this segment of I-5 as one of the most congested freight routes in the nation.

4.1.3 By 2020, if we make no improvements in both our freeway and transit system, we can expect delay to nearly double, from about 18,000 hours today to about 32,000 hours in 2020. This delay and the resulting congestion and loss of reliability have an economic cost to our community. Not only will the cost of doing business increase, individual business productivity will be reduced, resulting in a poor quality transportation system to key employment and industrial centers that also threatens our long-term ability to attract and retain living wage employment in the Region.

4.1.4 The BIA improvements would:

- Reduce bottlenecks on the freeway and balance traffic flow.
- Improve key freight interchanges including Columbia Boulevard, Marine Drive, and Mill Plain Boulevard.
- Increase reliability and predictability on I-5.
- Improve bi-state transit service.

4.1.5 The benefits for the economy and freight include:

- Improved access to and from key industrial destinations such as the Port of Vancouver, Rivergate and the Columbia Corridor.

- Improved access to and from key employment centers such as Downtown Portland and Downtown Vancouver, Columbia Corridor, Swan Island, and Lloyd Center.
- Improved travel times and reduced congestion on I-5.
- Increased reliability and predictability in transit service.

4.1.6 The benefits of BIA improvements help to create a positive business climate and help make the Region an attractive place to locate and expand business.

4.2 KEY FINDINGS: River crossing capacity/Bridge Influence Area

4.2.1 Overall, the Bridge Influence Area (BIA) concepts show an improvement in freeway traffic speeds during the peak periods compared to Existing Conditions 2000 and Baseline 2020.

4.2.2 Within the range of concepts considered, however, there are some important differences:

- A replacement bridge provides the best performance in both the morning and the afternoon peak period.
- An eight-lane system plus the arterial connection performs better in the afternoon than in the morning. The morning problems with this concept are primarily a function of design. The concept places the HOV lane on a separate bridge. Because access to the separate bridge is limited in the BIA, many of the HOV trips return to the mainline just as they approach the existing bridge. This is occurring in about the same location as where the SR 14 on-ramp merges onto I-5 south. In combination, the two merges in the same location create congestion on the freeway. Additional engineering work may be able to solve the problems we observe for this concept.
- A collector/distributor system shows the least improvement in performance. In the morning it provides some improvement over Existing Conditions 2000 and Baseline 2020, but in the afternoon it provides little benefit. The design problems associated with this system are the least "fixable" due to its configuration.

4.2.3 An arterial bridge, constructed in combination with additional freeway lanes across the river could benefit the overall performance of the freeway system. It would provide a separate local connection across the river, reducing the need to use the mainline freeway system. The Baseline 2020 analysis shows that an arterial roadway would be heavily used primarily by localized trips.

4.2.4 A two-lane, arterial-only bridge (no increase in freeway lanes) will not address the problems on the freeway. The arterial-only connection would only slightly improve freeway performance by removing local trips. Users of the freeway system would continue to experience a significant increase in congestion and delay throughout the I-5 Trade Corridor.

4.2.5 BIA improvements are likely to result in minimal traffic increases on I-5 outside the Bridge Influence Area. Traffic, however, will increase on roadways with direct access to the BIA. These traffic increases are different in Portland and Vancouver. Portland would see increases on arterial streets near the BIA, while Vancouver's increases would be on state freeways.

4.3 KEY FINDINGS: Cost

4.3.1 Potential highway and transit costs in the BIA are all in the range of $1.2 billion (in 2001 dollars). This estimate includes major maintenance and seismic retrofit costs for the existing bridges.

4.3.2 The actual costs will vary depending on the final design, mitigation, inflation and other factors.

4.3.3 There is not a significant enough cost differential to eliminate any of the options based on cost alone. A full exploration of life cycle costs of the existing bridges and seismic retrofit costs should be completed during the EIS.

4.4 KEY FINDINGS: Property impacts

4.4.1 Potential property impacts vary depending on the Concept. Potential impacts range between 15-43 displacements and 42-59 encroachments for the full bridge influence area (SR 500 to Columbia Boulevard). Generally, for all Concepts, the greatest number of potential displacements and encroachments would be to non-residential properties.

4.4.2 The replacement bridge Concept has the least number of likely property impacts due to the fact that the structure would be located near the existing bridge and freeway alignment.

4.4.3 The majority of the property impacts would occur in Portland where improvements cross Hayden Island.

4.4.4 Additional survey, engineering and design work in the EIS process is needed before the actual number and extent of the displacements and encroachments is known.

4.5 KEY FINDINGS: Environmental impacts

4.5.1 Since all concepts included additional crossings of the Columbia River and North Portland Harbor, there may be potential impacts to fish habitat associated with bridge construction.

4.5.2 Three of the four concepts encroach into the Delta Park green space area (60 to 120 feet depending on concept).

4.5.3 Three of the four concepts have encroachments onto the radio tower wetlands site (100 to 240 feet depending on concept).

4.5.4 All concepts have encroachments onto the Ft. Vancouver Historical Site (60 to 120 feet depending on concept). An encroachment over 60 feet would impact the FHWA building located near the SR14 ramp to I-5 northbound. However, no historic buildings would be impacted.

4.5.5 All concepts would impact the Historic I-5 Columbia River Bridge with the full replacement bridge providing the most impact to the historic structure. The existing northbound bridge is

registered on the National Register of Historic Places and the southbound bridge is eligible for registration.

4.5.6 The EIS process will allow a full exploration of impacts to natural, cultural, historic, fish and park resources to determine the best balance for the environment and the community. Additionally, potential impacts to the radio tower wetland and Delta Park vary by design concept and would under go a detailed evaluation in an EIS.

4.6 KEY FINDINGS: Safety

4.6.1 BIA improvements address traffic safety concerns resulting from the high number of closely spaced entrances and exits. Improvement concepts would significantly reduce the number of entrances and exits by utilizing collector-distributor lanes adjacent to the freeway lanes. In addition, for the locations where ramps remained closely spaced, bridges would typically be used to separate the entering and exiting traffic.

4.6.2 None of the concepts considered would encroach on the restricted air space for the Pearson Air Park.

4.6.3 Impacts to marine navigation would be highest for those concepts that build a supplemental bridge. Multiple bridges with low-level lift span bridges would be built in close proximity to one another. Marine navigation hazards in the shipping channel would increase. The replacement bridge concept designed a high level-fixed span bridge that would relocate the navigational channel from the north shore to the center of the Columbia River. (Improvement to the rail bridge would also occur.) This concept would virtually eliminate the need for barge operators to navigate a curved path between the bridges.

4.6.4 Life-safety and emergency response to a catastrophic event is also a safety concern. The existing bridges do not meet current seismic standards and in the event of a major earthquake, they could fail. New bridges would be built to higher standards and would have a higher probability of withstanding a major earthquake.

4.7 KEY FINDINGS: Implementation

4.7.1 Bridge concepts with ten freeway lanes, and bridge concepts with eight freeway plus arterial lanes, appear promising.

4.7.2 Collector-distributor bridge systems have design problems and therefore provide little transportation benefit. Such design problems will be difficult to overcome.

4.7.3 A joint use (Hwy/LRT) bridge could be cost-effective but needs further study in an EIS. Constructing both LRT and freeway improvements on a single bridge could potentially result in some cost savings compared to building separate bridges. However, many other factors should also be considered, including right-of-way impacts, whether the existing bridges will be main-

tained or replaced, implications for siting the LRT station on Hayden Island, and construction staging.

4.7.4 Supplemental or replacement bridge: The existing bridges provide three lanes of traffic in each direction. They cannot be widened economically. To provide an addition of two lanes of traffic in each direction (for a total of up to five lanes), the bridges will either have to be replaced with a wider bridge, or a supplemental bridge will need to be constructed adjacent to the existing bridges. While further study is needed to conclude whether a new bridge should be supplemental to the existing bridges or should replace them, the analyses have identified several factors that will influence that decision:

- Traffic operations: With a supplemental bridge, freeway traffic in one or both directions would be split into two traffic streams across the river. With two separate traffic streams, along with many closely spaced interchanges near the river, it is difficult to balance traffic flows, and the analyses indicated that congestion would be significant on the bridge serving the near-by interchanges. By comparison, a replacement bridge would keep all directional traffic on one bridge, resulting in more balanced traffic flow.
- Cost: Current cost estimates indicate that there is little cost differential between a supplemental and a replacement bridge. Further exploration of cost issues will need to continue in an EIS.
- Right-of-way impacts: Replacing the existing bridges with a new bridge would focus the new construction within the existing right-of-way, thus minimizing impacts to adjacent parcels on Hayden Island and in downtown Vancouver.
- Impacts to property and natural, cultural and historic resources: All concepts are likely to have an impact on one or more of the key resources in the BIA. Concepts that build a new bridge (either supplemental or replacement) east of the existing bridges (upstream) have a higher probability of impacting the Fort Vancouver National Historic Site than those that replace the existing bridges in place, or those that build a new supplemental bridge to the west (downstream).

4.7.5 Some river crossing concepts include the conversion of one of the existing freeway bridges for LRT use. While that is technically feasible, the cost of retrofitting the bridges to include the modified decking, electric systems, cathodic protection, and other conversion costs would be significant. If upgrading the bridge to meet current seismic standards is required, the retrofit costs could easily exceed the costs of a new LRT bridge. Further study of this concept would require a detailed investigation of the retrofit costs and a comparison of those costs to a new bridge.

4.7.6 Concepts that provide for separate LRT and freeway bridges could potentially allow the LRT and highway projects to move forward independently of each other. However, further analysis is required to address the joint or separate bridge decision. Such a decision is likely to be based on LRT and highway alignment design requirements, right-of-way and environmental impacts, land use opportunities and constraints relative to siting an LRT station on Hayden

Island, construction costs, traffic staging, operating concerns, and potentially other concerns as well.

4.7.7 If subsequent studies indicate that the two modes can and should be considered separately, there is potential time savings for LRT, which may be implemented in a shorter time period given that substantial environmental and design work has already been completed in the South/North EIS.

RECOMMENDATION 4: Bridge Influence Area

R 4.1 New transit and vehicle capacity should be constructed across the Columbia River in the I-5 Trade Corridor.

R 4.2 For vehicles, there should be three through-lanes (and not more than three) in each direction and up to two auxiliary and/or arterial lanes in each direction across the Columbia River (total five lanes in each direction). For transit, there should be two light rail tracks across the Columbia River in the I-5 Trade Corridor.

R 4.3 In the Bridge Influence Area, SR 500 to Columbia Boulevard, the freeway needs to be designed to balance all of the on and off traffic, consistent with three through lane Corridor capacity and up to five lanes of bridge capacity, in each direction.

R 4.4 In adding river-crossing capacity and making improvements in the Bridge Influence Area, every effort should be made to (a) avoid displacements and encroachments, (b) minimize the highway footprint in the Corridor, and (c) minimize use of the freeway for local trips.

R 4.5 The proposed design should include safety considerations.

R 4.6 As a first step towards making improvements, the bi-state region should undertake an Environmental Impact Study for a new river crossing and potential improvements in the Bridge Influence Area.

R 4.7 In the EIS, the following BIA elements should be studied:

- Eight- or ten-lane freeway concepts
- Replacement or supplemental bridge
- Joint use or non-joint use freeway/LRT bridge
- Eight-lane freeway with joint LRT/two-lane arterial
- HOV throughout the I-5 Trade Corridor

R 4.8 Evaluate whether or not a six-lane freeway plus two two-lane arterials, one in the vicinity of the I-5 Trade Corridor and one in the vicinity of the railroad bridge, is a viable alternative for consideration in the EIS.

R 4.9 The following concepts do not show promise for addressing the Corridor's problems and should not be considered in an EIS:

- Collector-distributor bridge concepts
- Arterial-only bridge concepts
- Tunnel concepts

R 4.10 Special consideration needs to be given to the architectural aesthetics of any new structures to be built, particularly any new bridge structures.

5 ADDITIONAL RAIL CAPACITY

5.1 KEY FINDINGS: Freight and intercity passenger rail

5.1.1 Several low-to-medium cost solutions can significantly improve existing rail capacity. A series of projects have been identified by the railroads, Ports and the Oregon and Washington Departments of Transportation as viable, if funding were available. They are already well into planning or development, are operational, or are "relatively" low cost ($132 million) compared to more major improvements.

5.1.2 Additional passenger service in the Portland/Vancouver corridor will require major rail capacity improvements north of Vancouver, and south of Portland, as well as agreements between the railroads and affected state departments of transportation.

5.1.3 The principal "incremental" improvements include:

- Two-main track bypass around BNSF's Vancouver Yard.
- Revised crossovers and higher turnout speeds at North Portland Junction.
- Second main track and increased track speeds between N. Portland Junction, Peninsula Junction, and Fir on UP's Kenton Line.
- Expanded capacity and longer tracks at Ramsay and Barnes Yards.
- Connection in the SE quadrant at E. Portland between UP's Brooklyn and Graham Lines.
- Increased track speeds between UP Willsburg Junction and UP Albina.
- An upgraded "Runner" or River Lead between Albina and East Portland, and a second track through the East Portland interlocking.

5.1.4 The "incremental improvements" are sufficient to address capacity needs for 5 to 10 years, given a growth rate of 1.625 to 3.25% per year, at a performance level of 200 hours of delay (96 hours).

5.1.5 In 10 to 20 years, additional improvements beyond the identified "incremental improvements" will be needed to accommodate growth of both intercity passenger and freight rail, depending on economic growth rates and acceptable levels of service.

5.1.6 Within 10 to 20 years, improvements to accommodate the growth on the rail system may include the separation of the UPRR and BNSF rail lines in the N. Portland Junction and additional capacity across the Columbia River.

5.1.7 The incremental improvements, and later additional improvements noted in Section 5.1.5 above, will provide acceptable freight capacity for 10 to 20 years, and some marginal capacity to accommodate the 10-year plans for eight additional intercity passenger trains, but not for commuter rail service.

5.1.8 Determining the exact nature and cost of these incremental and additional, future improvements will require further study.

5.1.9 If rail capacity does not increase, reliability will decline and travel time and shipping costs may increase. Rail shippers may be forced to divert traffic, change modes or relocate. Intercity passenger service may not be able to be expanded.

- If intercity passenger rail service is to expand, privately owned rail facilities will require public-private cooperation to address capacity issues that constrain the system.
- The economics of freight movement make freight rail not as competitive with trucks at distances less than 500 miles, depending on commodity shipped.
- If capacity improvements are not implemented, rail congestion will increase, and shippers will consider alternative modes of moving freight, particularly by truck.
- The cost of delay to the freight railroads—as related to direct rail operating costs—will vary depending on geographic area, and types of trains and commodities shipped. An average direct cost of delay is estimated at $300 per hour of train delay. This figure, however, does not reflect the full impacts of the costs of delay to the railroads (potential loss of business revenue), and to the regional economy (jobs, loss of local businesses, and impacts on port development).
- A lift span in the center of the railroad bridge would result in greater and safer use of the center span of the Interstate Bridges by barge traffic, resulting in fewer lifts of the Interstate Bridge and reducing delay on I-5.

5.2 KEY FINDINGS: Commuter rail

5.2.1 Commuter rail service cannot operate effectively on the freight rail network over the next 10 to 20 years, even with the identified incremental and additional network improvements. Commuter rail service could be instituted only on a separated passenger rail-only network. A separated passenger rail-only, high-speed rail system would improve intercity passenger rail service and could drive the feasibility of commuter rail in the Region. However, the capacity analysis shows taking intercity passenger rail service off of the freight rail network would not free up enough capacity on the existing rail network.

5.2.2 The unconstrained commuter rail system modeled for the I-5 Partnership process provides fast travel times. It serves areas not well served by transit, particularly suburban and outlying areas (Salmon Creek, North Clark County, I-205 Corridor and East Clark County). It does not appear to serve the same market as light rail.

5.2.3 The cost of a separated passenger network is $1.5 to $1.7 billion. These higher costs have a higher level of uncertainty than the other studied options. This uncertainty is attributed to geologic issues, the potential for significant right-of-way costs, the need for environmental mitigation, and the need for additional connecting transit service, feeder bus service, and Rose Quarter station and connections.

5.2.4 The Commuter Rail service modeled assumes new dual tracks over the entire length of service area (Ridgefield to Washougal). Train frequencies, average speed, travel times, and estimated ridership is based on dual tracks throughout proposed network. A combination of dual tracks,

and single tracks with periodic sidings for train meets and passing may be possible, but will likely result in less frequent service, slower average speed, longer travel times, and reduced ridership.

5.2.5 Potential commuter rail right-of-way displacements associated with a new, dual-track system, include approximately 35 residences on the Ridgefield line, 55 residences on the Washougal line, four to five industrial properties in Portland and eight in Vancouver. The alignment may also require the relocation of SR 14 or the Evergreen Highway at several "pinch points" along the Washougal line. Finally, there will likely be additional neighborhood impacts from noise, traffic, retaining walls, and the high volume of feeder bus connections necessary to serve the 78th St./Lakeshore and Ridgefield stations.

5.2.6 Further study would be needed of the capacity of a joint LRT/transit bus/commuter rail service transit center at the Rose Quarter Transit Center to accommodate the high volume of transferring transit riders anticipated. The commuter rail service modeled assumes sufficient LRT and bus capacity for the necessary regional connections, but does not include the cost for a Transit center. Finally, this particular alignment is not consistent with the City of Portland's plan designation of Union Station as its Regional Transportation Center.

5.2.7 Commuter rail may impact the direction of growth in the Region by facilitating the development of lower density residential housing patterns in suburban and outlying areas of Clark County, instead of to more serviceable urban locations.

5.2.8 The environmental impacts from commuter rail include the crossing of significant wetlands by the Ridgefield line, and the mitigation costs are not included in the above cost estimates.

5.2.9 In regions with similar population characteristics as the Portland/Vancouver area, all-day commuter rail service is not common. Most such systems operate peak-period service only. Systems that offer limited mid-day service have generally experienced a 10 to 20% increase in ridership over their daily, peak-period ridership. The four-hour PM peak ridership estimate is 8,150, and using the 10 to 20% factor, 8,965 to 9,780 all-day riders.

- As modeled, commuter rail with the light rail transit loop will reduce river crossings by 1,700 vehicles during the four-hour PM peak period, or about 560 vehicles in the peak hour, both directions, both bridges. This is a 2% reduction in vehicle crossing of the Columbia River in the PM peak four hours.
- Commuter rail creates potential funding competition between it and LRT because both are eligible for the same federal "New Starts" funding pool.

RECOMMENDATION 5a: Freight rail

R 5a.1 The proposed Bi-State Coordination Committee should establish a public/private forum to implement these rail recommendations. The "Bi-State Rail Forum" should be comprised of representatives from Oregon and Washington Departments of Transportation, regional planning agencies (Metro, RTC), Ports of Portland and Vancouver, cities of Portland and Vancouver, Amtrak and the Union Pacific and Burlington Northern/Santa Fe Railroads. The Rail Forum would serve as an advisory group to the Bi-State Coordination Committee for the identification of needed rail capacity improvements, highway/rail grade separations, and Port access projects.

R 5a.2 The Bi-State Coordination Committee, through the Rail Forum, should initiate an aggressive program to:

- Facilitate the efficient rail movement of freight in the Portland/Vancouver Region
- Coordinate the multi-modal transportation services offered in the area to increase port access and streamline the movement of freight throughout the I-5 Trade Corridor
- Coordinate with other freight movers (truck, barge, marine, aviation) to facilitate inter-modal connections, minimize conflicts among modes, and maximize cooperation.
- Develop strategies to implement the specific findings of the I-5 Partnership Rail Capacity Study, including prioritizing and scheduling the "incremental improvements."
- Study and pursue the rail infrastructure improvements required to accommodate anticipated 20 year freight rail growth in the I-5 Trade Corridor and frequent, efficient intercity passenger rail service between Seattle, Portland and Eugene. This may include: the separation of the UPRR and BNSF rail lines in the N. Portland Junction and additional capacity across the Columbia River.

R 5a.3 The Bi-State Coordination Committee, through the Rail Forum, should also:

- Negotiate the cost allocation responsibilities between public and private stakeholders
- Work collaboratively with regional governments and agencies to advocate for the funding and implementation of rail projects at federal, state, regional and local levels.
- Explore means to facilitate the operation of the BNSF Columbia River Rail Bridge by seeking funding for the replacement of the existing "swing span" with a "lift span" located closer to the center of the river channel. Locating a "lift span" in the center of the river will facilitate safer barge movements between the I-5 Interstate Bridge and the BNSF rail bridge. A "lift span" can be opened and closed more quickly than a "swing span," thus reducing the delay of crossing the river for freight rail.
- Coordinate with the Congressional delegations of both states, regional agencies, and railroads, to encourage the US Coast Guard to recognize the hazard to navigation caused by the existing BNSF railroad bridge, and to award Truman-Hobbs Act funding to replace the existing "swing span" with a "lift span."

RECOMMENDATION 5b: Intercity passenger rail

R 5b.1 The Bi-State Coordination Committee, through the Rail Forum, should:

- Coordinate efforts by both states to encourage greater funding at the state and federal level for additional intercity passenger rail service along the federally designated, Pacific Northwest High Speed Rail Corridor, recognizing the need to ensure compensating capacity to the private railroads for any loss of freight capacity

- Coordinate with the Congressional delegations of both states to encourage passage of pending federal legislation for enhanced funding of High Speed Rail service in the Corridor.
- Work cooperatively with freight railroads to add capacity to the existing rail lines, where appropriate, to enable additional operation of intercity passenger rail service. This capacity might be achieved either by compensating capacity used by the addition of intercity passenger trains on the freight network rail lines, or by separating passenger train service from the freight network and putting it on a passenger rail-only network, as appropriate.
- Support efforts to add capacity outside the Portland/Vancouver Region that will improve train speeds and enable additional intercity passenger rail service.

RECOMMENDATION 5c: Commuter Rail

R 5c.1 Commuter rail should not be studied in an EIS at this time.

6 LAND USE AND LAND USE ACCORD

6.1 KEY FINDINGS: Land use

6.1.1 Without changes in land use policy, the following land use development trends can be expected, regardless of the transportation actions taken in the I-5 Trade Corridor:

- Population and employment growth in the Portland/Vancouver Region are developing in a dispersed pattern. A significant share of households and employment are locating at the urban fringe, within adopted zoning.
- There will be more job growth in Clark County than anticipated in our current adopted plans. Even with a reduced percentage of commuters crossing the river, I-5 will be congested.
- Industrial areas are at risk of being converted to commercial uses, threatening the availability of industrial land in the Portland/Vancouver Region and increasing traffic congestion in the I-5 Trade Corridor.

6.1.2 Without investment in the I-5 Trade Corridor, we can expect that traffic congestion and reduced travel reliability will have an adverse economic effect on industries and businesses in the Corridor.

6.1.3 With highway and transit investments in the Corridor, there will be travel-time savings that can be expected to have the following benefits:

- Attract employment growth toward the center of the Region to the Columbia Corridor along the I-5 Trade Corridor from elsewhere in the Region.
- Strengthen the regional economy by attracting more jobs to the Region.
- New job opportunities for residents near the I-5 Trade Corridor because of their close proximity to the Corridor improvements being considered.
- Mixed-use and compact housing development around transit stations.

6.1.4 Highway and transit investments in the Corridor also carry risks if growth is not well managed:

- Increased demand for housing in Clark County due to the location of jobs in the center of the Region
- Increased pressure to expand the Clark County urban growth area along the I-5 Trade Corridor to the north.
- Industrial areas are at greater risk of being converted to commercial uses at new and improved interchanges with the improved travel times at these locations.

6.1.5 Growth must be managed to ensure that:

- Growth in Clark County does not result in new capacity being used by commuters, instead of for goods movement.
- The expected life span of investments is not shortened
- Scarce industrial land is not converted to commercial uses.
- Local jurisdictions implement necessary zoning and regulatory changes to attract mixed use and compact housings around transit stations.

6.1.6 The recommendations and potential improvements called for in this Strategic Plan are largely compatible with state, regional and local land use plans. See **Attachment C**.

RECOMMENDATION 6: Land use and land use accord

R 6.1 To protect existing and new capacity and support economic development, RTC and Metro, along with other members of the current Bi-State Transportation Committee, should adopt and implement the Bi-State Coordination Accord. (See **Attachment D**). Key elements of the Accord include the following:

- Jurisdictions and agencies agree to protect the I-5 Trade Corridor and will manage development to:
  - Preserve mobility and protect industrial land along I-5
  - Protect existing, modified and new interchanges
  - Adopt development plans for transit station areas
  - Coordinate management plans
- The Bi-State Transportation Committee will expand its role to review and advise JPACT, RTC, other councils, commissions and boards on:
  - Management plans, interchange plans and agreements and transit station plans for the I-5 Trade Corridor.
  - Other transportation, land use and economic development issues of bi-state significance.

- Jurisdictions and agencies agree before new river crossing capacity is added to adopt drafts of management plans, agreements and actions and include in environmental documents.
- Jurisdictions and agencies agree before I-5 is widened at Delta Park to:
  - Form the Bi-State Coordination Committee.
  - Have the Committee review environmental documents.
- Complete plans to manage existing interchanges with deliberate speed.

R 6.2 The Accord signatories need to develop the operational details of the Accord through the proposed Bi-State Coordination Committee.

7 TRANSPORTATION DEMAND/SYSTEM MANAGEMENT (TDM/TSM)

7.1 KEY FINDINGS: TDM/TSM

7.1.1 Transportation Demand Management (TDM) and Transportation System Management (TSM) are essential strategies for improving our mobility. TDM is about reducing auto trips, shortening some, eliminating others, and making our transportation systems more efficient. TSM measures are designed to manage the transportation system to improve its operation, reliability and efficiency for all users. TSM measures can also be targeted to improve the transportation system for specific users such as carpools, transit or freight.

7.1.2 TDM/TSM can be thought of like a package of common business-management practices known as "asset management." Just as business tries to increase efficiency, respond to its market and use new technology, so does TDM/TSM. Just as business tries to maximize its capital return through adding second employee shifts, TDM tries to maximize the existing highway capacity by managing peak demand and reducing the share of single occupant vehicle trips. Business may use "just-in-time" inventory while TSM uses traffic signal timing and timed transfers. A business uses express checkout stands and frequent flyer benefits while TDM offers HOV bypasses and discounted transit passes. Business develops new products—or new and improved products—while TDM develops new services like vanpooling or new and improved transit routing.

7.1.3 There is no single silver bullet in the TDM/TSM arsenal. However, additional transit service is the single most important investment necessary to achieve TDM/TSM targets and TDM/TSM strategies are most effective when used in a coordinated approach. Current TDM measures focus primarily on peak period commute trips. Future TDM/TSM activities must be broadened to face the challenge of non-work trips as well.

7.1.4 Some TDM/TSM actions can be specifically targeted to the I-5 Trade Corridor. However, most TDM/TSM actions can only be broadly applied, region-wide. The Bi-State Region has basic

TDM/TSM service levels in place. Policies and employer-based programs have increased the visibility and success of demand management programs and have helped to extend them throughout the Region.

7.1.5 TDM and TSM actions are an important part of the I-5 Trade Corridor Strategic Plan. They can minimize transportation capacity needed in the I-5 Trade Corridor and maximize the transportation system's reliability, efficiency and usable life. While the focus is on achieving Corridor-wide targets, these targets cannot be met without regional goals being in place.

7.1.6 The TDM/TSM recommendations will be most effective only if the Region also provides and implements the other Strategic Plan recommendations, especially:

- Transit services will be provided to Clark County with an LRT loop and supplementary express bus service.
- Current planned park and ride lots will be funded and constructed. Additional park and ride spaces will be made available to support the light rail system.
- An HOV lane will operate in both directions between Going Street in Portland and 134th Street in Vancouver.
- The new river crossing(s) will include a quality bicycle/pedestrian facility.
- Land use actions that support alternative mode share will continue to be pursued in the Region and I-5 Trade Corridor.

7.1.7 Costs and effectiveness for the most-promising TDM/TSM actions have not currently been quantified due to the interrelated nature of the activities and lack of detailed accounting for individual TDM and TSM costs. For example, TDM education program success depends on the availability of good transit service, the price of parking, the quality of the education program and many other costs that are not estimated separately in practice.

RECOMMENDATION 7: TDM/TSM

R 7.1 **Final targets:** Ultimately, the proposed Bi-State Coordination committee should adopt *final* TDM/TSM targets for the I-5 Trade Corridor and the Region that are acceptable, attainable and measurable.

R 7.2 The following **interim targets** should be adopted now by the jurisdictions and agencies in the I-5 Trade Corridor and ultimately by the proposed "Bi-State Coordination Committee." The Region's Travel Demand Forecasting Model, monitoring programs, or other mutually agreeable methods should measure them:

- Increase Non-Single Occupancy Vehicle share, including transit and vanpools, across the Columbia River (I-5 and I-205) in the peak periods to 43%* by the year 2020. Year 2000 non-SOV use is estimated at 38%** for the PM peak.
- Maintain average, mid-day travel speeds through the I-5 Trade Corridor at 70% of the maximum posted speed limits (50 to 60 mph) for trucks on I-5 traveling between I-405 and I-205 to avoid spreading the peak hours of congestion into the mid day period when the most trucks are on the road. Currently the

* Data Source: Metro's Regional Travel Forecast Model for year 2020. This scenario assumes additional TDM measures beyond Metro's Regional Transportation Plan TDM assumptions. The percentage excludes trucks and inter-regional trips, i.e., external-to-external trips.

** Data Source: Metro's Regional Travel Forecast Model for year 2000. The percentage excludes trucks and inter-regional trips, i.e., external-to-external trips.

average mid-day speed is at 58 mph between I-84 and I-205 on I-5 (speed limits in the corridor range between 50 and 60 mph).

- Reduce daily VMT/capita for the urban areas of the four-county region by 10% by 2020. Current daily regional VMT/capita is estimated at 16.4 miles/person.
- Increase peak period, travel reliability through the I-5 Trade Corridor and major arterials in the Corridor by maintaining travel times for all vehicles.***

R 7.3 **Overall objectives**: In addition to the other Task Force infrastructure and land use recommendations, the Region's commitment to basic TDM/TSM services should be expanded and enhanced, existing gaps in services should be filled, and funding should be increased beyond current levels. A mix of promising TDM/TSM actions described in the attached "Action Items and Rough Costs Matrix" should be implemented for:

- Alternative mode services that provide an option to driving alone
- Alternative mode support that makes it easier to use other modes
- Worksite-based strategies that focus on education and incentives at the workplace
- Public policy and regulatory strategies that influence mode choice
- Pricing strategies that change parking or road prices
- TSM strategies that improve efficiency of the road system

R 7.4 **Support transit**: Additional transit service is the single most important investment necessary to achieve the TDM/TSM targets. Additional service coverage, frequency and availability throughout the day will provide the foundation for success. The Region's transit agencies, with the support of other jurisdictions and agencies, should seek the necessary public funding for transit service improvements. On a region-wide basis, the Region spends $162 million per year to operate the transit system. An additional $155 million per year is needed to operate transit services at the "Priority" level assumed in the Baseline 2020. Note: TriMet needs the higher "Preferred" level of funding to meet Metro's 2040 Goals.

R 7.5 **Fund study for plan:** The regional transportation partners, with the guidance of the proposed "Bi-State Coordination Committee," should collaboratively prepare an "I-5 TDM/TSM Corridor Plan" to identify the final TDM/TSM targets, implementation details, funding sources, priorities and costs. Upon its completion, the proposed Bi-State Coordination Committee should review the plan, finalize both Corridor and regional targets, and lead an effort to secure additional funding for the selected TDM/TSM measures. The proposed Bi-State Coordination Committee should establish a geographically balanced TDM subcommittee to assist its I-5 Corridor and regional TDM/TSM target-setting and plan implementation. The cost of completing the "I-5 TDM/TSM Corridor Plan" is approximately $250,000.

R 7.6 **Plan elements**: The plan should:

- Evaluate the proposals in the "Action Items and Rough Costs Matrix" (**Attachment E**).
- Include person and truck travel survey results to document existing travel patterns and supplement other ongoing behavior survey data.
- Identify the short-term (before construction of improvements), mid-term (during construction) and long-term (after construction) TDM/TSM actions for the I-5 Trade Corridor and Region, in addition to the recommended current actions noted below.
- Identify the level of funding needed to achieve the level of trip reduction agreed to by the proposed Bi-State Coordination Committee (based on final Corridor and regional targets).
- Identify lead agency/jurisdictional responsibilities for implementation and tracking success.

***This issue and the final target reference points should be part of the study noted in sections F and G, below. Travel time reliability could be improved by decreasing the number, severity and duration of incidents in the Corridor through improved incident response. Improving the travel time reliability on I-5 should be balanced with the suitable travel times on the adjacent arterials.

R 7.7 **Recommended current actions:** The jurisdictions and agencies in the I-5 Trade Corridor and the Region should take action now. At a minimum, the Region should maintain and strengthen the TDM and TSM programs on both sides of the river. Additionally, the Task Force recommends implementation of the "current actions" and the additional "new money" investments noted in the following table. The estimated annual costs for the current actions are roughly $1.9 million per year or about $9.5 million over five years. While the recommended TDM/TSM actions are I-5 Corridor-focused, the Task Force recommends a regional approach, given the inherent inter-relationship of the I-5 Corridor and the regional transportation system.

Recommended current action items — I-5 Trade Corridor focused	Annual cost estimates
1. Education and outreach to provide information about work destination based, peak hour travel options. The first phase would be a survey to document existing origin and destination travel patterns.	$1,000,000
2. Promote business subsidy of transit passes for employers.	$10,000
3. Promote carpoolmatchNW.org to assist in carpool formation.	$150,000
4. Offer guaranteed rides home at work sites.	$20,000
5. Explore methods to better integrate C-TRAN and Tri-Met printed and real-time customer information to expedite Bi-State travel using both systems, e.g., C-TRAN service information on Tri-Met Real Time Kiosks and expanding the number of kiosks would cost approximately $300,000.	$300,000
6. Explore business and community interest for additional and/or expanded Transportation Management Association in the I-5 Trade Corridor between the Columbia River and Lloyd District, including Swan Island, Rivergate and Interstate Avenue. (One-time study).	$50,000
7. Increase coordination between Oregon and Washington Transportation Management Centers to improve freeway management and operations, including incident management.	$200,000
8. Identify priority locations for planned ramp meters and deploy integrated, bi-state, ramp meter timing for the I-5 and I-205 Corridors.	$140,000
Total estimated annual cost	$1,870,000

R 7.8 **Recommended Mid-Term Actions**: The regional partners should begin planning for the TDM/TSM measures necessary during the construction of the I-5 Trade Corridor improvements.

R 7.9 **Recommended Long-Term Actions**: TDM and TSM strategies from the "I-5 TDM/TSM Corridor Plan" should be evaluated further in the environmental process for the I-5 Trade Corridor improvements. The TDM/TSM strategies should be part of any final I-5 Trade Corridor project.

R 7.10 **Timing**: The proposed Bi-State Coordination Committee needs to agree on the "I-5 TDM/TSM Corridor Plan," TDM/TSM targets for the I-5 Trade Corridor and the Region, and the appropriate levels of financial commitment and implementation that must be in place before construction begins on any new river-crossing capacity.

8 ENVIRONMENTAL JUSTICE

8.1 KEY FINDINGS: Environmental justice

8.1.1 The states of Washington and Oregon have initiated the Portland/Vancouver I-5 Transportation and Trade Partnership in response to the problem of growing congestion on the highway and rail systems.

8.1.2 The I-5 Partnership Task force has adopted a Problem, Vision and Values Statement to guide its work. The statement reads in part: "The principles of environmental justice will be followed in developing the Strategic Plan and making recommendations for the corridor."

8.1.3 There are four fundamental environmental justice principles:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.
- To incorporate analysis in the EIS process of cumulative risks and disparate impacts due to multiple exposures.*

8.1.4 Highway and transit projects recommended by the I-5 Partnership Task Force are in or near low-income and/or minority communities both in Oregon and Washington.

8.1.5 To begin defining how the draft recommendations for improvements to the I-5 Trade Corridor may impact and benefit low-income and minority residents, a series of meetings—two meetings in each state—were held with community stakeholders.

RECOMMENDATION 8: Environmental justice

R 8.1 A community enhancement fund for use in the impacted areas in the I-5 Trade Corridor in Oregon and Washington should be established. Such a fund would be in addition to any impact mitigation costs identified through an environmental impact statement and would be modeled conceptually after the "1% for Arts" program, the I-405 Mitigation Fund and the St. John's Landfill Mitigation Fund. The Bi-State Coordination Committee would recommend the specific details in conjunction with the Environmental Justice Work Group noted in Section R8.6 below.

R 8.2 Continued work should be done to complete a list of communities, organizations and agencies to outreach to low income and minority communities during the EIS process.

R 8.3 ODOT and WSDOT, in cooperation with the potentially impacted communities, should develop a methodology and criteria to map low income and minority communities in areas potentially affected by the recom-

* A reasonable effort, consistent with applicable EPA standards should be made in the EIS to assess cumulative impacts.

mendations from the I-5 Partnership. The methodology and criteria will be applied to 2000 Census data (currently income data only exists for 1990 and new data will not be available until the summer of 2002) for use in the EIS.

R 8.4 A list of potential positive and negative community impacts were identified by the stakeholders and should be taken into the EIS process to be used as a beginning point to conduct further analysis on impacts. (See **Attachment F**).

R 8.5 Should there be a finding during the EIS process that there are disproportionate impacts for environmental justice communities, the list of potential community benefits identified by the stakeholders should be a starting point for a community conversation about how to offset impacts and/or bring benefits to the impacted community. (See **Attachment G**).

R 8.6 During the EIS process, special attention needs to be paid to conducting outreach to low-income and minority residents in the Study Area. Community stakeholders generated a list of outreach and involvement ideas. This list should be taken into the EIS process and used as the basis to develop a public outreach and involvement plan that includes outreach to low income and minority communities. (See **Attachment H**).

R 8.7 A Public Involvement and Environmental Justice Working Groups should be formed at the beginning of the EIS. Work group membership should include representatives from environmental justice communities along the corridor. The Public Involvement working group should address public outreach. The Environmental Justice working group membership should include liaisons to the Public Involvement working group to ensure community concerns are incorporated into the EIS and that adequate emphasis is placed on the potential impacts and benefits to low income and minority communities.

9 ADDITIONAL ELEMENTS AND STRATEGIES CONSIDERED

9.1 KEY FINDINGS: West Arterial Road

9.1.1 The West Arterial Road is a possible complement to, but does not substitute for, I-5 improvements. While this potential improvement falls slightly behind on all measures of transportation performance, it does provide significant benefits. Compared to Baseline 2020, time travel savings between downtown Portland and downtown Vancouver are approximately 6 minutes, delay is reduced by 20%, and congestion is reduced by 17%.

9.1.2 This option has several benefits to the regional transportation system including relieving traffic on I-5, providing an additional connection between Oregon and Washington, relieving the St. Johns neighborhood of through truck traffic, and providing an efficient south-north arterial for (a) freight movement between key industrial areas in the Portland/Vancouver area and (b) other traffic in North Portland.

9.1.3 However, the traffic impacts to Vancouver neighborhoods and the downtown Vancouver district are significant. It is very likely that arterial roads leading to this new connection would need to be widened to accommodate the traffic traveling between the West Arterial Road and the freeway. The widening of these arterial roads would need to be mitigated.

9.1.4 The West Arterial Road, as currently conceived, would have similar property impacts as improvements in the I-5 Trade Corridor. This does not account for property impacts that would occur if arterial roads need to be widened to accommodate traffic access to this new road.

9.1.5 Due to the fact that the West Arterial Road crosses Hayden Island, home to a variety of wildlife species and a high quality wetland, it has the greatest potential for impacts to natural resources of all the Option Packages with moderate to major impacts likely.

9.1.6 While the West Arterial Road appears to result in less emissions directly at the freeway, emissions would increase on arterial roads.

9.1.7 The estimated cost of West Arterial Road is $947 million (2001 dollars).

RECOMMENDATION 9a: West Arterial Road

R 9a.1 Further study of this option should be pursued and identified as a potential transportation solution for consideration in the future and should not be an alternative studied in the EIS for the Bridge Influence Area.

9.2 KEY FINDINGS: Additional elements and strategies

9.2.1 As part of the Task Force's work, many potential elements and strategies that are not specifically commented on in this draft document were considered, including:

- Addressing the Corridor's problems with land use actions and/or transportation demand management alone.
- A new freeway with bridge outside the I-5 Trade Corridor (east of I-205, west of I-5) to connect Oregon and Washington.
- Monorail
- Personal rapid transit
- Hovercraft bus
- People-mover
- Water taxi
- Ferry
- Helicopter
- Gondola

9.2.2 The Task Force also considered various combinations of these elements and strategies.

RECOMMENDATION 9b: Additional elements and strategies

R 9b.1 The Task Force does not believe the additional elements and strategies show promise for addressing the corridor's problems and should therefore not be considered in an EIS.

10 FINANCING OPTIONS

10.1 KEY FINDINGS: Financing Options

10.1.1 Highway and transit improvements in the I-5 Trade Corridor between Portland and Vancouver will be an expensive undertaking. Capital costs (in 2001 dollars) are estimated at Bridge Influence Area ($1.2 billion),* and Light Rail Loop ($1.0 billion).

10.1.2 Capital projects of the magnitude recommended by the Task Force typically require a variety of funding and financing mechanisms. The Region will not be able to rely on any single revenue source.

10.1.3 There are several promising federal, state and local revenue sources that could be available for financing the proposed projects (**Attachment I**).

10.1.4 The revenue-generating capacity of several of these sources taken together is quite large and provides the ability to bond all or most of the capital cost of the projects.

10.1.5 While it will be a difficult undertaking, requiring substantial political leadership, Oregon and Washington, in cooperation with federal and local governmental partners and, perhaps, private sector entities, have the financial capacity to construct the projects.

10.1.6 By constructing elements of the highway and transit improvements as separate components or in phases, the financial impacts can be spread over a greater number of years and can enable a wider range of funding sources to be used for construction.

10.1.7 Developing a final funding package for the bi-state improvements will be a complicated process that will involve a number of diverse entities, including state legislatures, federal agencies, and various financial institutions.

10.1.8 To be fully effective, the capital investments must be supported by a significant increase in basic transit service. The light rail loop in Clark County must be served by frequent bus service. In addition, the single most important investment necessary to achieve the TDM/TSM

* BIA costs include light rail costs of approximately $150 to $200 million. The costs, in 2001 dollars, could range from $1.2 to $1.5 billion for the BIA, and $1 to 1.3 billion for light rail depending on the final design, mitigation measures, and other unanticipated factors

targets is additional transit service coverage, frequency and availability throughout the day. Successful implementation of the draft recommendations will require a significant increase in transit operating revenue.

10.1.9 A focused bi-state and regional effort is needed to determine how to meet the Region's goals for increased transit service. C-TRAN operating revenue and service is particularly at risk. Due to the passage of I-695 in 2000, C-TRAN's tax revenue was cut in half. They are currently filling that revenue gap with funds in their reserve account, but without an increase in basic operating revenue by 2007, transit services will be cut dramatically.

RECOMMENDATION 10: Financing

R 10.1 Oregon and Washington, and the Portland/Vancouver Region, should work together to identify opportunities to fund the widening of I-5 to three lanes in each direction between Delta Park and Lombard. This project is anticipated to be ready for construction by September 2004.

R 10.2 Other capital elements of the transit and highway recommendations will take longer to fund. As a first step towards development of a financing plan for the highway and transit improvements, Oregon and Washington, together with regional partners and representatives of both legislatures should begin working together to explore long-term funding opportunities.

R 10.3 TriMet and C-TRAN should undertake separate, yet coordinated efforts to develop a plan to increase operating support to enable an expansion in transit service starting within the next five years. For C-TRAN, a Transit System Development Plan should be developed in conjunction with the next planning steps for the light rail loop system.

R 10.4 Efforts to increase transit operating revenue for TriMet and C-TRAN should be coordinated and discussed by the new Bi-State Coordinating Committee. The goal should be to establish regional transit financing commitments that will allow for an aggressive bi-state TDM program and expansion of transit service to support construction of the phased light rail loop.

11 Next steps and implementation

RECOMMENDATION 11: Next Steps and Implementation

R 11.1 This Strategic Plan should be sent to the Oregon Transportation Commission, the Washington Department of Transportation, and to the metropolitan planning organizations in Portland and SW Washington for review and potential adoption into their transportation plans.

R 11.2 Parallel with the adoption of the transportation recommendations into the regional transportation plans, the metropolitan planning organizations in Portland and SW Washington should adopt a Bi-State Coordination Agreement and establish the Bi-State Coordination Committee. Once established, the Bi-State Coordination Committee should proceed with all deliberate speed to:

- Form the TDM/TSM Forum and begin its work on the I-5 TDM/TSM Corridor Plan.
- Begin discussions and planning for investing more in the I-5 Trade Corridor, including focused TDM/TSM actions that can be taken now.
- Form the Rail Forum and begin its work.

R 11.3 As to highway and transit capital investments in the corridor:

- Oregon and Washington, and the Portland/Vancouver Region, should work together to identify opportunities to fund the widening of I-5 to three lanes in each direction between Delta Park and Lombard. This project is anticipated to be ready for construction by September 2004.
- As a first step towards making improvements, the bi-state region should undertake an Environmental Impact Study for a new river crossing and potential improvements in the Bridge Influence Area. That study and the implementation of these recommendations should be guided by the Task Force's Problem Vision and Values Statement.
- In the EIS, the following BIA elements should be studied:
  - Eight- or ten-lane freeway concepts
  - Replacement or Supplemental Bridge
  - Joint use or non-joint use Freeway/LRT Bridge
  - Eight-lane freeway with joint LRT/two-lane arterial
  - HOV throughout the I-5 Trade Corridor.
  - In addition, a six-lane freeway plus two two-lane arterials, one in the vicinity of the I-5 Trade Corridor and one in the vicinity of the railroad bridge, should be evaluated to determine if it is a viable alternative for consideration in the EIS.
  - The following concepts do not show promise for addressing the Corridor's problems and should not be considered in an EIS:
    - Collector-distributor bridge concepts
    - Arterial-only bridge concepts
    - Tunnel concepts
- Public Involvement and Environmental Justice Working Groups should be formed at the beginning of the EIS. Working group membership should include representatives from environmental justice communities along the Corridor. The Public Involvement working group should address public outreach. The Environmental Justice working group membership should include liaisons to the Public Involvement working group to ensure community concerns are incorporated into the EIS and that adequate emphasis is placed on the potential impacts and benefits to low income and minority communities.
- Parallel to this EIS process, a plan for funding the highway and transit capital expenditures should be developed.

R 11.4 As to transit operations, TriMet and C-TRAN should work with all deliberate speed to undertake efforts to increase operating support to enable an expansion in transit service starting within the next five years. This effort should be coordinated through the Bi-State Coordinating Committee.

R 11.5 ODOT and WSDOT should continue to work with environmental justice stakeholders to complete the research to identify groups and communities to conduct outreach with during the EIS process, and to identify the low income and minority communities that could be affected by the recommendations in this plan.

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Attachment A

Option Packages

The I-5 Portland/Vancouver Transportation and Trade Partnership Task Force developed a number of multi-modal Option Packages. From these, five were selected for further analysis. All five Option Packages contain transit and road elements, a call for increased transportation demand management and transportation system management, and a major increase in transit service throughout the Portland/Vancouver region.

The five Option Packages are:

- Express Bus/3 Lanes
- Light Rail/3 Lanes
- Express Bus/4 Lanes
- Light Rail/4 Lanes
- West Arterial Road

This attachment contains information about the Option Packages. **Figure A-1**, Baseline 2020, is not an Option Package but shows transportation improvements that are already planned over the next 20 years. **Figures A-2 – A-6** describe the improvements that would be made in each of the Option Packages (in addition to the improvements in Baseline 2020). **Figures A-7– A-22** compare the Option Packages based on transportation performance, such as hours of vehicle delay, transit travel time, and vehicle user cost savings.

The Task Force has recommended the Light Rail/3 Lane Option Package (**Figure A-3**).

Baseline 2020

134th to 99th

Add third lane each direction. New SB lane would operate as HOV during the morning peak period.

99th to the I-5 Columbia River Bridges

Third lane opened each direction fall 2001. Implement SB lane only as HOV during the morning peak period.

Hayden Island to Marine Dr.

Add new four-lane bridge.

Marine Dr. from Terminal 6 to Portland Rd.

Widen to five lanes.

Delta Park to Lombard

Add third SB lane and improve shoulders.

Columbia Blvd./Killingsworth St. intersection and connection to I-205

Modify intersection.

Expo Center to the Rose Quarter

LRT under construction with planned opening in 2004.

Rose Quarter (I-405 to I-84)

Add third lane in each direction. Reconfigure some existing ramps.

Existing LRT

The Baseline 2020 option includes the regional transit and roadway improvements and transportation demand management (TDM) measures in the adopted transportation plans for Clark County and the Portland metropolitan area. This figure shows the locations of the major improvements expected to affect transportation to, from, and along I-5. Baseline features are common to all options.

Figure A-1. Baseline 2020 transportation improvements.

Express Bus / 3 Lanes

134th to 99th

Add third lane each direction. New SB lane would operate as HOV during the morning peak period.

99th to the I-5 Columbia River Bridges

Third lane opened each direction fall 2001. Implement SB lane only as HOV during the morning peak period.

Along I-5, from 134th in Vancouver to the LRT station at the Expo Center

Add express bus service in HOV lanes.

Along I-205, SR 500, and SR 14

Possibly develop express bus service in general-purpose lanes.

SR 500 to SR 14

Potentially modify interchanges.

Columbia River crossing

Build a new, four-lane, supplemental, joint-use bridge for express bus, HOV, trucks, and Hayden Island access.

Hayden Island to Columbia Blvd.

Potentially modify interchanges.

Delta Park to Lombard

Add third SB lane and improve shoulders.

Expo Center to the Rose Quarter

LRT under construction with planned opening in 2004.

Rose Quarter (I-405 to I-84)

Add third lane in each direction. Reconfigure some existing ramps.

Existing LRT

The major feature of this option is the connection of the express bus service in Clark County with the Portland metropolitan LRT system. The option also includes a new, supplemental I-5 bridge for express bus, HOV, and vehicular traffic.

Figure A-2. Express Bus/3 Lanes Option Package.

Light Rail / 3 Lanes

134th to 99th

Add third lane each direction. New SB lane would operate as HOV during the morning peak period.

99th to the I-5 Columbia River Bridges

Third lane opened each direction fall 2001. Implement SB lane only as HOV during the morning peak period.

134th to SR 500 along I-5 and I-205

Possibly extend LRT.

Downtown Vancouver to Vancouver Mall area along SR 500 or Fourth Plain

Extend LRT.

SR 500 to SR 14

Modify interchanges.

Along I-205, from NE 83rd Padden Expwy to Parkrose Station

Extend LRT and connect to Airport MAX.

To Downtown Vancouver

Extend LRT.

Build supplemental bridge for . . .

(1) Joint use — LRT, HOV, trucks, and Hayden Island access — or

(2) LRT only

Hayden Island to Columbia Blvd

Potentially modify interchanges.

Delta Park to Lombard

Add third SB lane and improve shoulders.

Expo Center to the Rose Quarter

LRT under construction with planned opening in 2004.

Rose Quarter (I-405 to I-84)

Add third lane in each direction. Reconfigure some existing ramps.

Existing LRT

The major feature of this option is the development of an LRT system in Clark County connecting to the Portland metropolitan LRT system along I-5 and I-205. The option also includes a new supplemental Columbia River bridge. Two variations of the bridge have been studied: (1) a joint-use bridge for LRT and motor vehicle traffic and (2) an LRT-only bridge.

Figure A-3. Light Rail /3 Lanes Option Package.

Express Bus / 4 Lanes

Along I-5 from 134th in Vancouver to the Fremont Bridge in Portland

Add fourth lane in both directions.

Along I-5 from 134th in Clark County to Downtown Portland

Develop express bus service in HOV lanes.

Along I-205 from 134th in Clark County to the Parkrose LRT station and Downtown Portland and from I-5 to I-205 on SR 500

Possibly develop express bus service.

SR 500 to SR 14

Potentially modify interchanges.

Columbia River crossing

Build a new supplemental bridge or completely replace the existing I-5 Columbia River Bridges.

Hayden Island to Going St.

Potentially modify interchanges.

Expo Center to the Rose Quarter

LRT under construction with planned opening in 2004.

Along I-5 from 134th in Clark County to the Fremont Bridge in Portland

Add fourth lane in both directions.

Rose Quarter (I-405 to I-84)

Add third lane in each direction. Reconfigure some existing ramps.

Existing LRT

The major features of this option are:

- widening I-5 to add a fourth lane in each direction between 134th in Clark County and the Fremont Bridge in Portland that would operate as an HOV lane during peak periods
- connecting express bus service in Clark County with the Portland metropolitan LRT system

Figure A-4. Express Bus/4 Lanes Option Package.

Light Rail / 4 Lanes

Along I-5 from 134th in Vancouver to the Fremont Bridge in Portland
Add fourth lane in both directions.

134th to SR 500 along I-5 and I-205
Possibly extend LRT.

Downtown Vancouver to Vancouver Mall area along SR 500 or Fourth Plain
Extend LRT.

SR 500 to SR 14
Potentially modify interchanges.

Along I-205, from NE 83rd Padden Expwy to Parkrose Station
Extend LRT and connect to Airport MAX.

Columbia River crossing
Build a new supplemental bridge or completely replace the existing I-5 Columbia River Bridges.

To Downtown Vancouver
Extend Interstate MAX.

Hayden Island to Going St.
Potentially modify interchanges.

Expo Center to the Rose Quarter
LRT under construction with planned opening in 2004.

Along I-5 from 134th in Clark County to the Fremont Bridge in Portland
Add fourth lane in both directions.

Rose Quarter (I-405 to I-84)
Add third lane in each direction. Reconfigure some existing ramps.

Existing LRT

The major feature of this option is the development of an LRT system in Clark County connecting to the Portland metropolitan LRT system along I-5 and I-205. The option also includes adding a fourth lane in each direction along I-5 from 134th in Clark County to the Fremont Bridge in Portland for HOV, express lanes, or freight use.

Figure A-5. Light Rail /4 Lanes Option Package.

New West Arterial Road

134th to 99th

Add third lane each direction. New SB lane would operate as HOV during the morning peak period.

99th to the I-5 Columbia River Bridges

Third lane opened each direction fall 2001. Implement SB lane only as HOV during the morning peak period.

SR 500 to SR 14

Potentially modify interchanges.

From Mill Plain in Vancouver to US 30 in Portland

New four-lane arterial generally following BNSF rail corridor.

Delta Park to Lombard

Add third SB lane and improve shoulders.

Hayden Island to Columbia Blvd.

Potentially modify interchanges.

Expo Center to the Rose Quarter

LRT under construction with planned opening in 2004.

Rose Quarter (I-405 to I-84)

Add third lane in each direction. Reconfigure some existing ramps.

Existing LRT

The major feature of this option is a new arterial road along the existing railroad corridor and N. Portland Rd. between Mill Plain Blvd. in Vancouver and US 30 in Portland.

Figure A-6. New West Arterial Road Option Package.

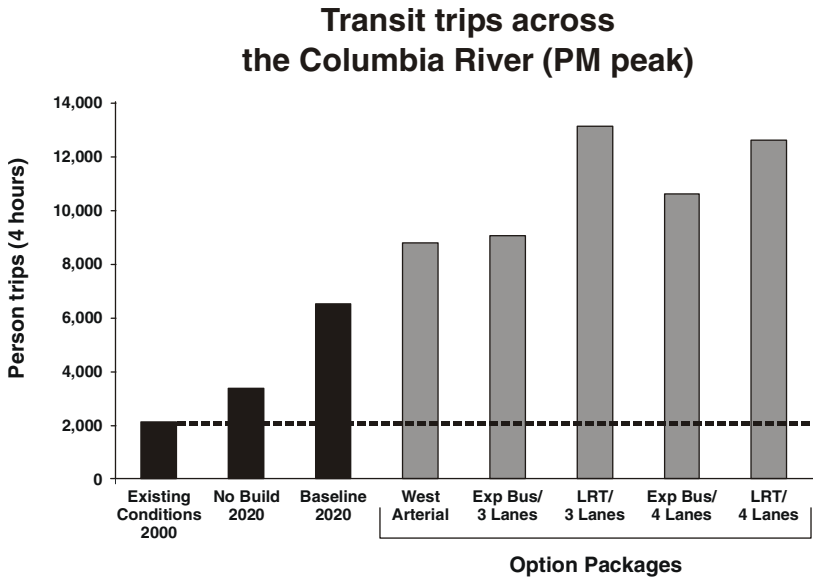

Figure A-7. The Option Packages compared to Existing Conditions 2000, No Build 2020, Baseline 2020, and each other, in transit trips across the Columbia River (PM peak).

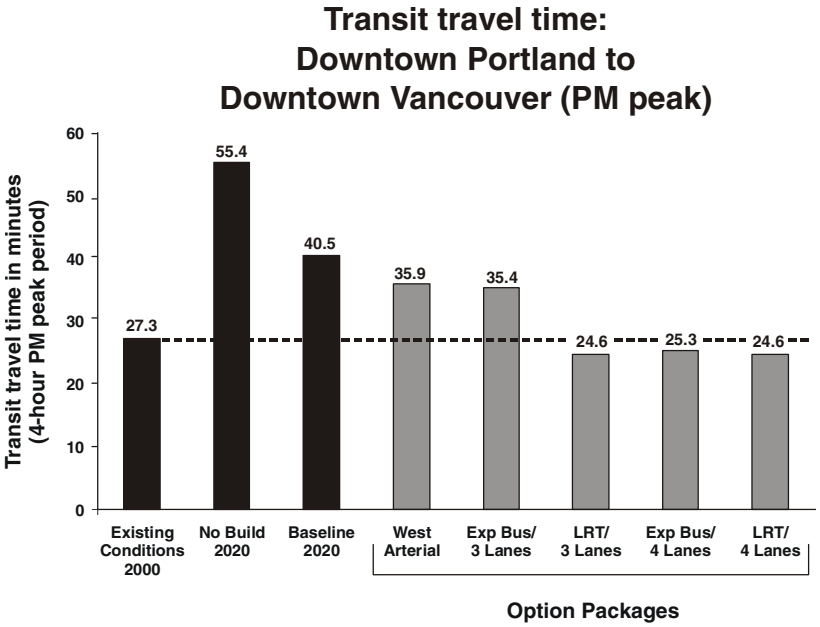

Figure A-8. The Option Packages compared to Existing Conditions 2000, No Build 2020, Baseline 2020, and each other, in transit travel time from Downtown Portland to Downtown Vancouver (PM peak).

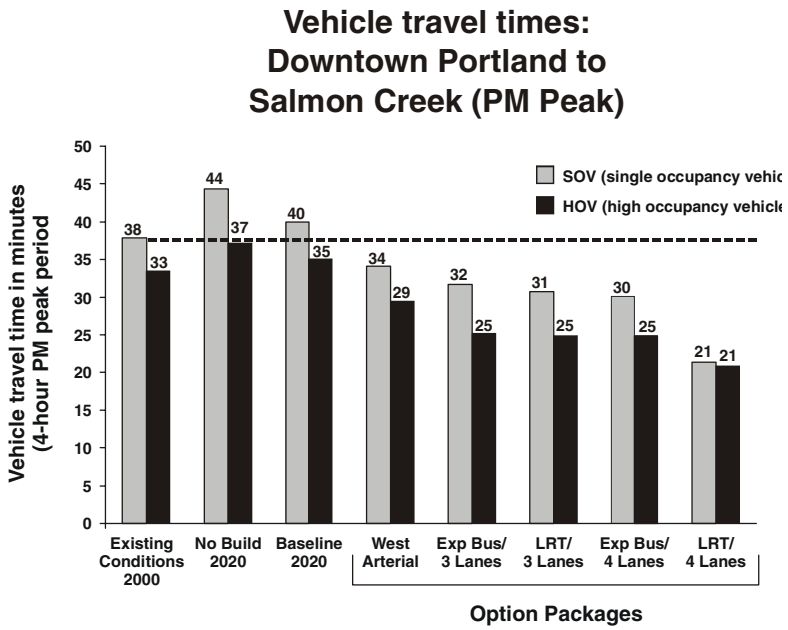

Figure A-9. The Option Packages compared to Existing Conditions 2000, No Build 2020, Baseline 2020, and each other, in vehicle travel times for SOVs/trucks and HOVs from Downtown Portland to Salmon Creek (PM peak).

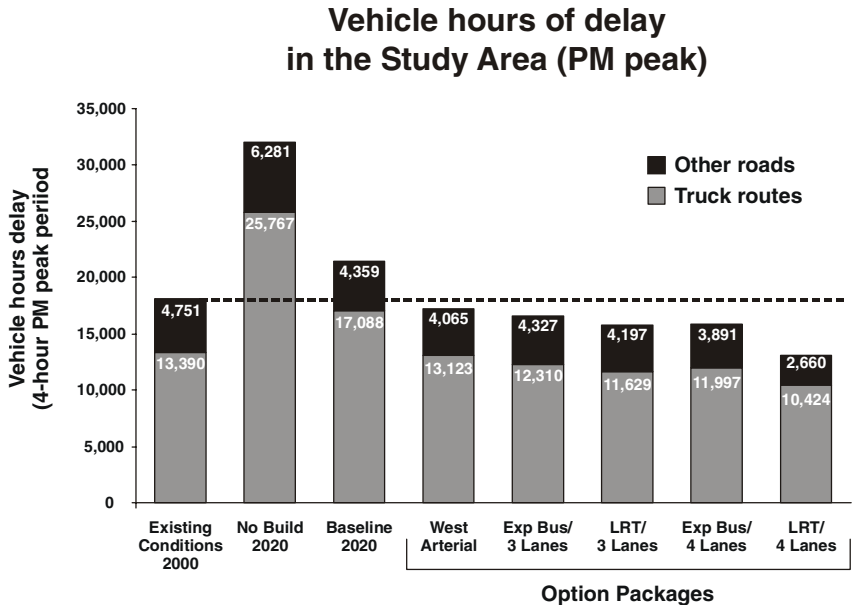

Figure A-10. The Option Packages compared to Existing Conditions 2000, No Build 2020, Baseline 2020, and each other, in vehicle travel hours of delay in the Study Area (PM peak) for truck routes and other roads.

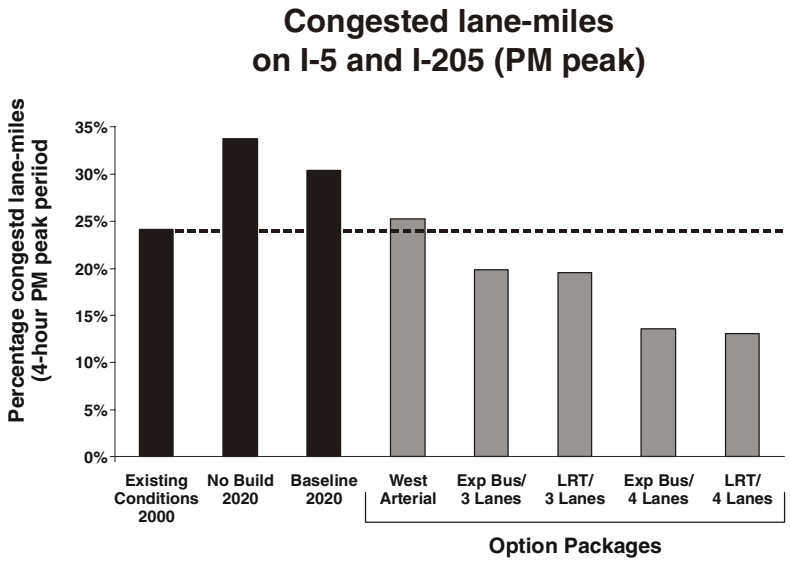

Figure A-11. The Option Packages compared to Existing Conditions 2000, No Build 2020, Baseline 2020, and each other, in congested lane-miles on I-5 and I-205 (PM peak).

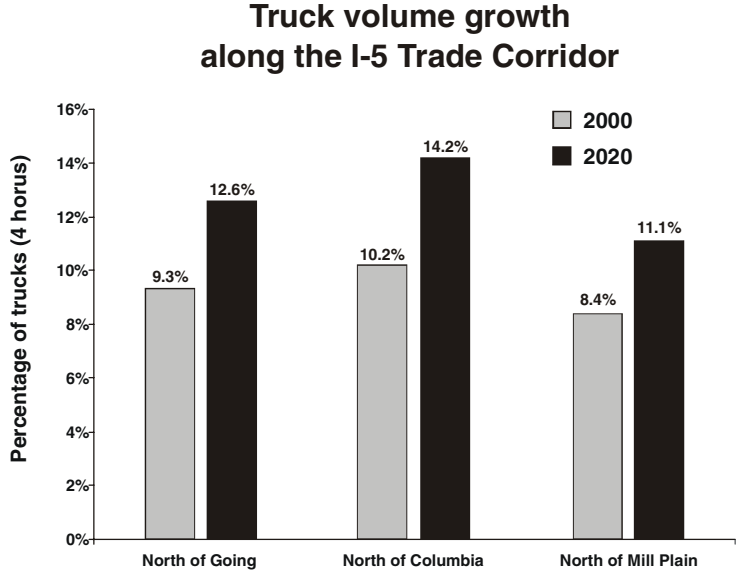

Figure A-12. Truck volumes along the I-5 Trade Corridor at three locations for 2000 and projected for 2020.

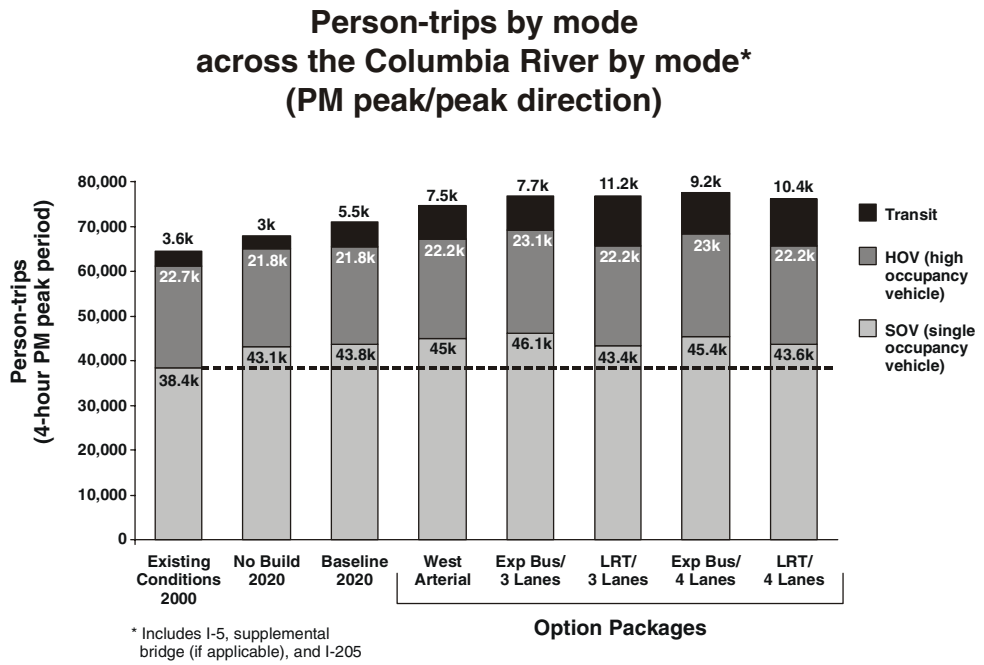

Figure A-13. The Option Packages compared to Existing Conditions 2000, No Build 2020, Baseline 2020, and each other, in person-trips by mode across the Columbia River by mode (PM peak/peak direction).

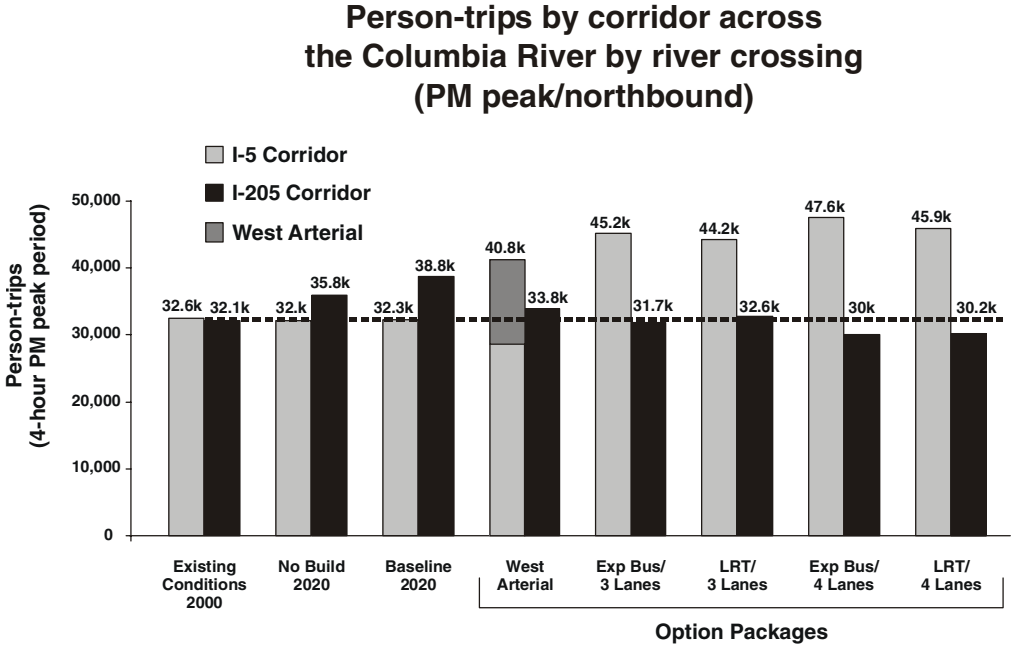

Figure A-14. The Option Packages compared to Existing Conditions 2000, No Build 2020, Baseline 2020, and each other, in person-trips by corridor across the Columbia River by river crossing (PM peak/northbound).

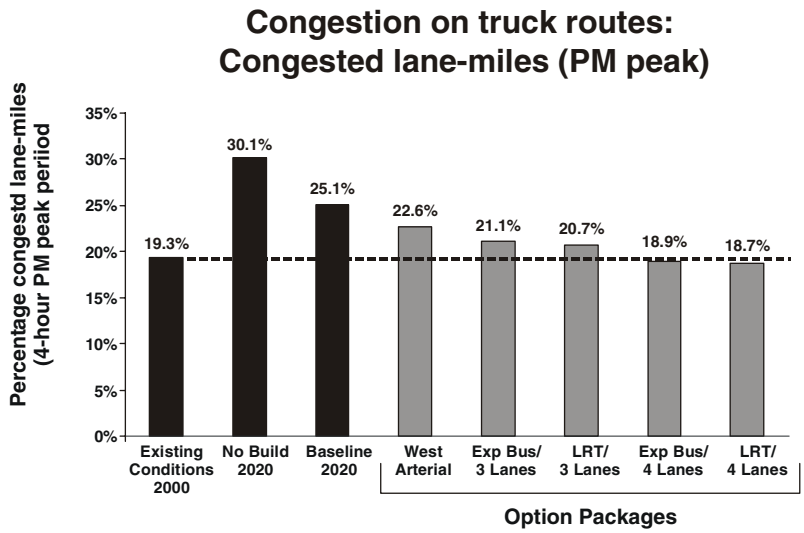

Figure A-15. The Option Packages compared to Existing Conditions 2000, No Build 2020, Baseline 2020, and each other, in congestion on truck routes in congested lane-miles (PM peak).

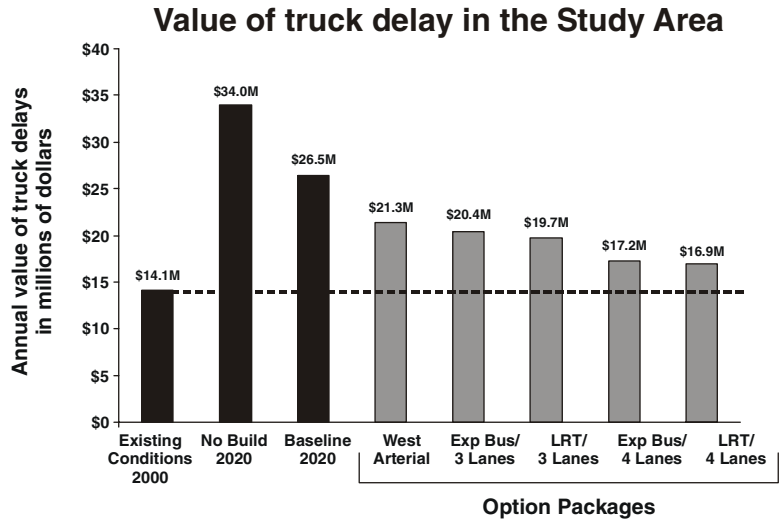

Figure A-16. The Option Packages compared to Existing Conditions 2000, No Build 2020, Baseline 2020, and each other, in value of truck delay in the Study Area.

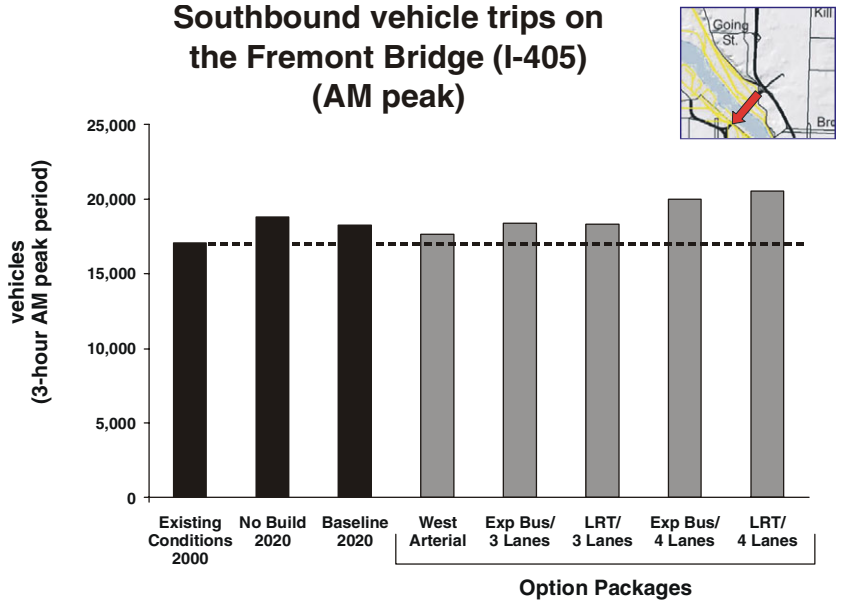

Figure A-17. The Option Packages compared to Existing Conditions 2000, No Build 2020, Baseline 2020, and each other, in southbound vehicle trips on the Fremont Bridge (I-405) (AM peak).

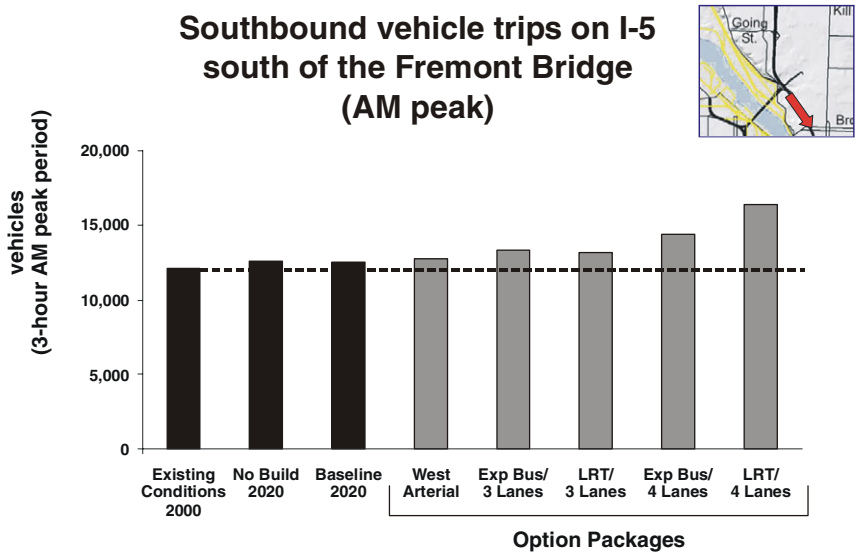

Figure A-18. The Option Packages compared to Existing Conditions 2000, No Build 2020, Baseline 2020, and each other, in southbound vehicle trips on I-5 south of the Fremont Bridge (AM peak).

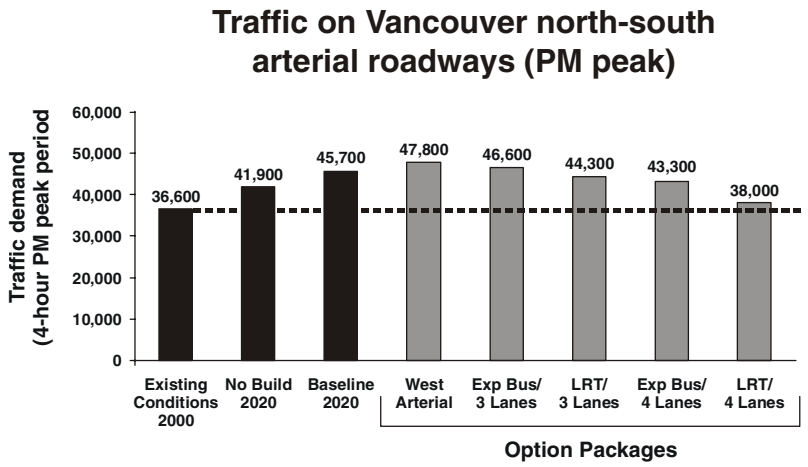

Figure A-19. The Option Packages compared to Existing Conditions 2000, No Build 2020, Baseline 2020, and each other, in traffic on Vancouver north-south arterial roadways (PM peak).

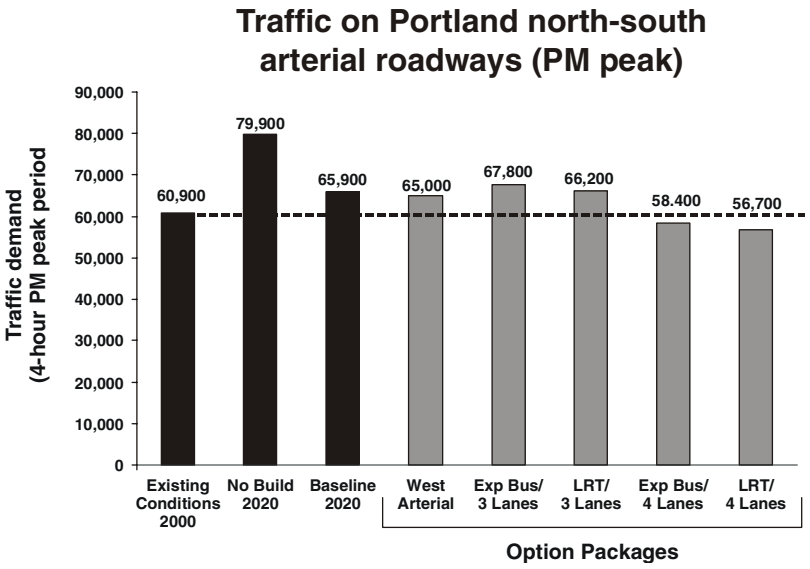

Figure A-20. The Option Packages compared to Existing Conditions 2000, No Build 2020, Baseline 2020, and each other, in traffic on Portland north-south arterial roadways (PM peak).

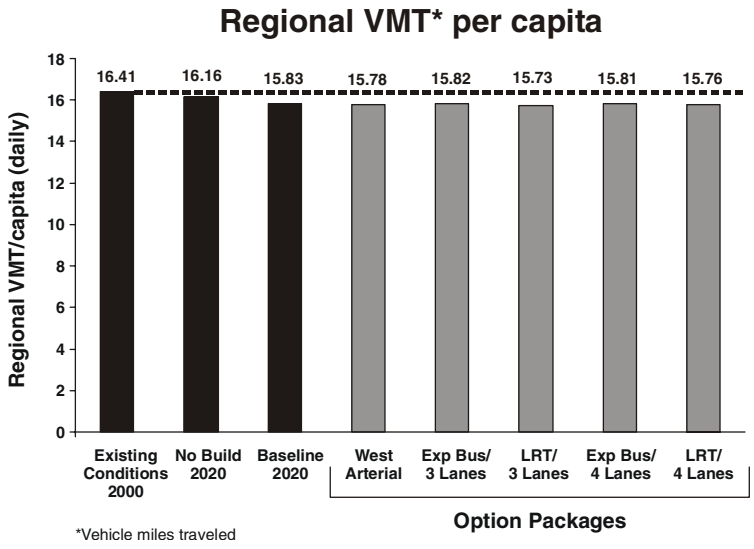

Figure A-21. The Option Packages compared to Existing Conditions 2000, No Build 2020, Baseline 2020, and each other, in regional VMT per capita.

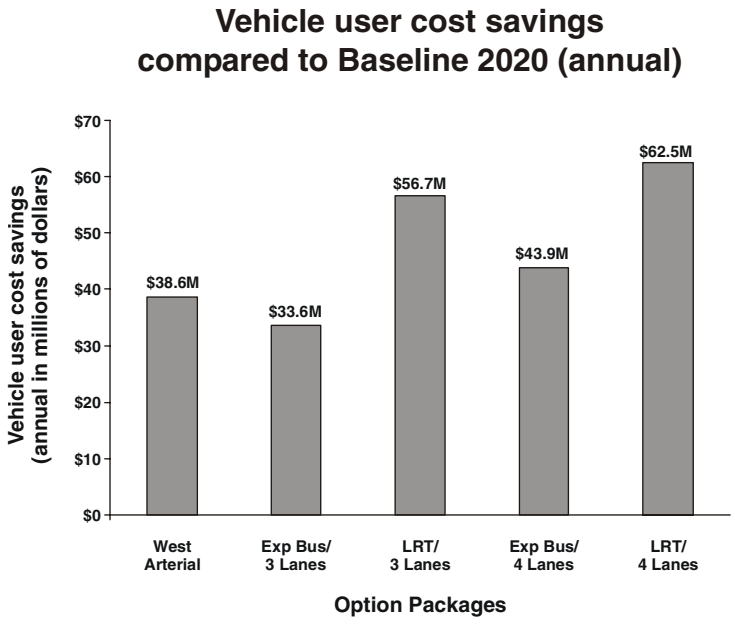

Figure A-22. User cost savings compared to Baseline 2020 (annual) for the Option Packages.

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Attachment B

Bridge Influence Area

A number of river crossing options were considered during analysis of the Bridge Influence Area (BIA). The BIA is defined as I-5 between SR 500 and Columbia Boulevard (**Figure B-1**) and is heavily used. Of the trips across the Columbia River on I-5, 70 to 80% either enter or exit I-5 in the BIA. Between 30 and 40% of those get on and off within the BIA (**Figure B-2**).

Figure B-1. The Bridge Influence Area (I-5 between SR 500 and Columbia Boulevard).

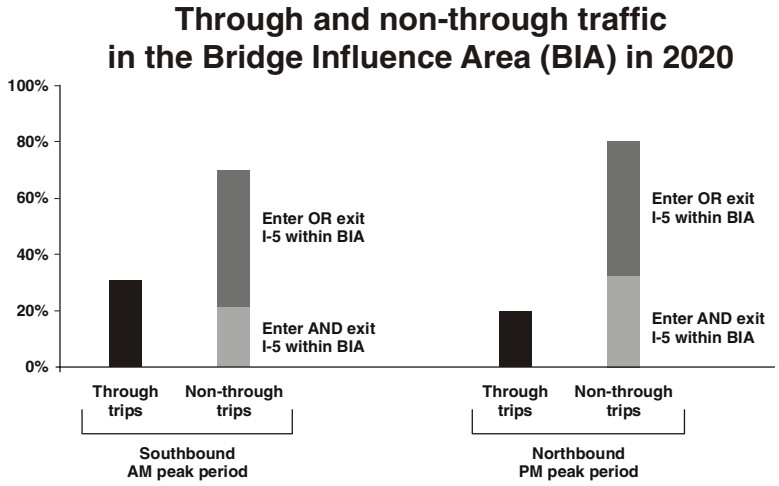


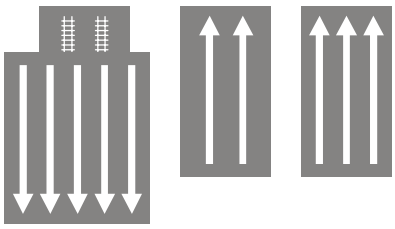
Figure B-2. Traffic in the BIA in 2020.

The Task Force developed eight Columbia River crossing concepts, consisting of combinations of new and existing bridges. The concepts fall into three categories (**Figures B-3 through B-5**).

CATEGORY 1: Five freeway lanes in each direction

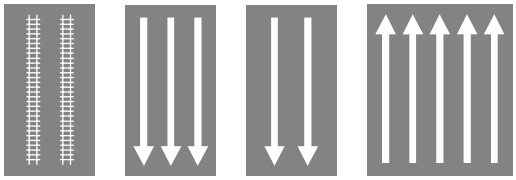
Concept #1

- 5 northbound lanes on existing bridges
- 5 southbound lanes on new double-deck bridge, LRT on lower deck, west of existing bridges



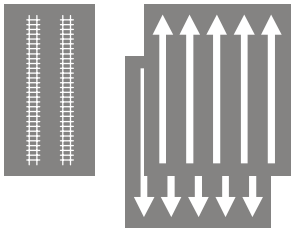
Concept #2

- 5 northbound lanes on new bridge east of existing bridges
- 5 southbound lanes on existing bridges
- New LRT bridge west of existing bridges



Concept #3

- New 5-lane double-deck bridge, northbound upper deck, southbound lower deck
- LRT on existing west bridge



Concept #4

- New 5-lane double-deck bridge, northbound upper deck, southbound lower deck
- LRT on new bridge west of existing bridges
- Only option to shift navigational channel

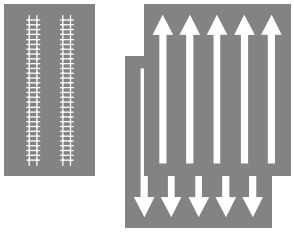
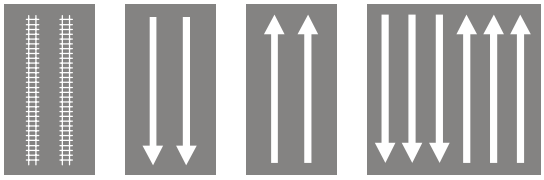


Figure B-3. The four Columbia River crossing concepts in Category 1.

CATEGORY 2: Three through freeway lanes in each direction plus a four-lane collector-distributor bridge/roadway west of the freeway

Concept #5

- New 6-lane bridge east of existing bridges
- 2 lanes northbound/southbound collector-distributor on existing bridges
- LRT on new bridge west of existing bridges



Concept #6

- 3 lanes northbound/southbound on existing bridges
- New 4-lane collector-distributor double-deck bridge with LRT on lower deck

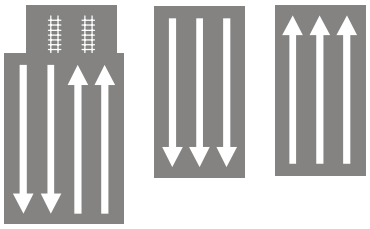
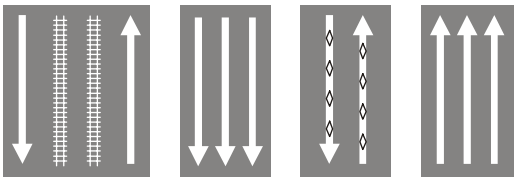


Figure B-4. The two Columbia River crossing concepts in Category 2.

CATEGORY 3: Four through freeway lanes in each direction plus a two-lane arterial system connecting Hayden Island to Marine Drive and Downtown Vancouver

Concept #7

- 3 southbound lanes on existing west bridge
- HOV only, southbound and northbound, on existing east bridge
- 3 northbound lanes on new bridge east of existing bridges
- 2 arterial lanes and LRT on new bridge west of existing bridges



Concept #8

- New 8-lane bridge east of existing bridges
- Local arterials on existing northbound bridge
- LRT on existing southbound bridge

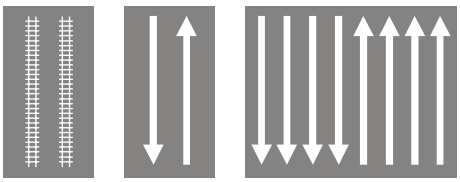
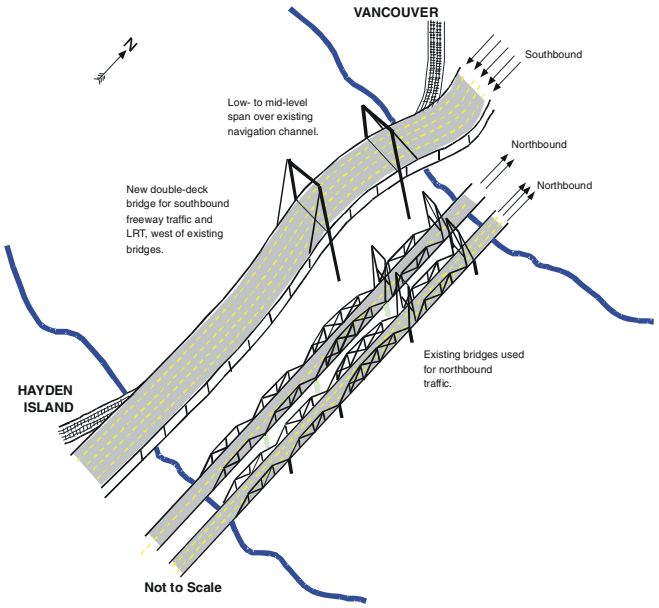


Figure B-5. The two Columbia River crossing concepts in Category 3.

Concepts 1, 4, 6, and 7 were selected for detailed design and evaluation. Analysis of these concepts provides insight into issues of supplemental and replacement bridges, joint use (LRT-highway) and separate bridges, alignments east and west of existing bridges, freeway lanes and arterial lanes across the Columbia River, and a comparison between high-level, fixed span bridges to low-level movable span bridges. See **Figures B-6 through B-9**.



CONCEPT 1

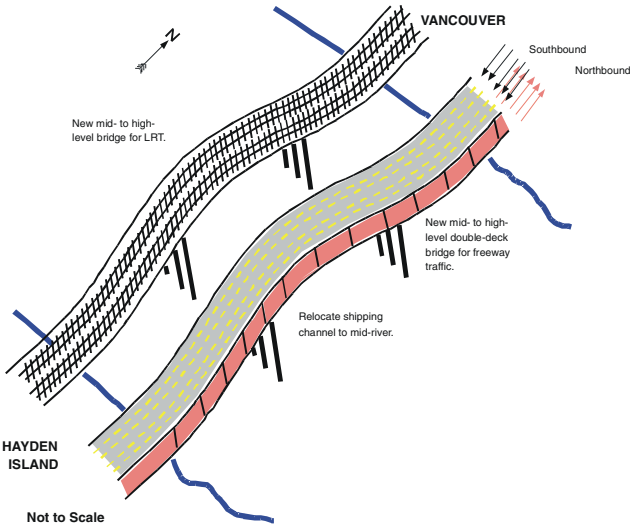
5-lane southbound supplemental bridge for freeway traffic with LRT

1. Southbound traffic on new five-lane bridge, LRT on lower deck west of existing bridges

2. Low- to mid-level bridge, with lift span over existing navigation channel

3. Northbound traffic would be split between the two existing bridges

Figure B-6. Columbia River crossing: Concept 1.



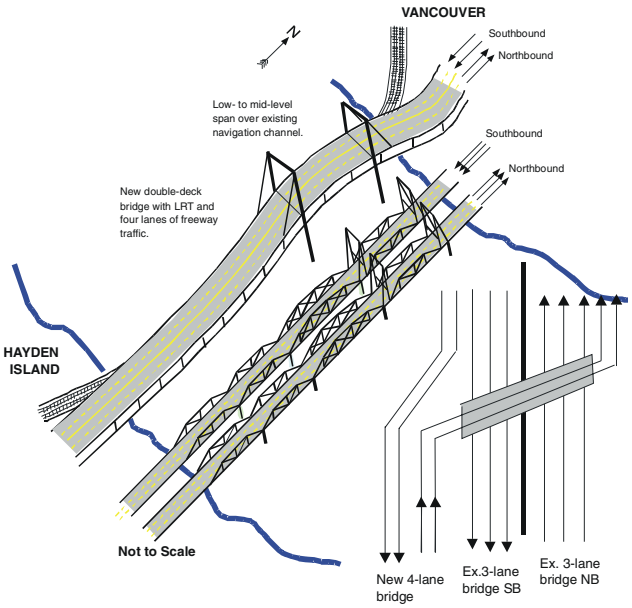
CONCEPT 4

10-lane double deck, replacement bridge, plus LRT on separate new bridge

1. Mid- to high-level bridges. Navigation channel relocated to center of river

2. Potential fixed spans for highway and LRT (with Coast Guard reduction of existing lift requirements), or liftspans

Figure B-7. Columbia River crossing: Concept 4.



CONCEPT 6

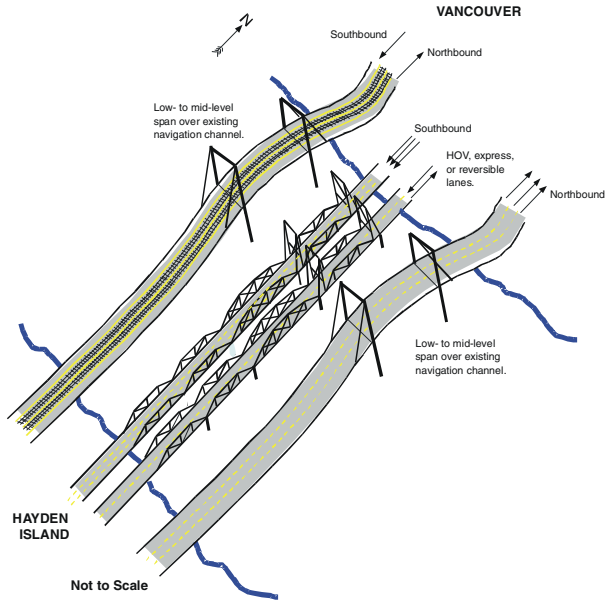
4-lane supplemental collector-distributor bridge w/LRT, plus 6-lane freeway

1. Provides for new 4-lane bridge with LRT west of the existing bridges

2. Low- to mid-level bridge with lift span over current navigation channel

3. Uses 4-lane bridge as collector-distributor (e.g., ramp access for Hayden Island). Requires flyover ramps north and south, as shown

Figure B-8. Columbia River crossing: Concept 6.



CONCEPT 7

8-lane freeway concept plus new LRT bridge with two-lane arterial

1. Provides for new 2-lane bridge plus LRT

2. Low- to mid-level bridges with lift spans over current navigation channel

3. Two lanes on existing northbound bridge could be used for HOV, express lanes, or (potentially) reversible lanes

Figure B-9. Columbia River crossing: Concept 7.

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Attachment C

Land Use Compatibility of Task Force Recommendations

This document summarizes the compatibility of the Task Force recommendations with state, regional and local land use plans. In general, existing land use policies in the region support the Task Force's recommendations for road and transit improvements in the corridor, the implementation of TDM/TSM strategies, and the need for the Bi-State Land Use Accord.

Regional land use issues and related population and employment forecasts are discussed first, followed by a discussion of issues from the Washington perspective (state, RTC, county, city) and the Oregon perspective (state, Metro, city).

Overall compatibility with adopted policies

By reducing delay and congestion in the I-5 Corridor and improving bi-state transit service, all concepts support the Metro 2040 Growth Concept and the Clark County Comprehensive Plans to encourage employment growth in the I-5 Corridor.

The build recommendations raise two issues of regional concern. First, improvements in the corridor are likely to increase land values around interchanges. There will be pressure for development around the interchanges that may unexpectedly increase the demands on the freeway system. Second, improvements may also increase pressure to change existing regional plans as demand for housing increases. Without careful planning, traffic increases that result from development around interchanges and expansions of growth boundaries for housing growth can nullify the transportation performance benefits of the build recommendations.

The I-5 Corridor has one of the most complex and diverse land use types in the metropolitan area. The complexity of the activities requires frequent interchanges and additional lanes to provide access, manage the through traffic, and the on/off ramps. The mix of activity centers and industrial areas will require a comprehensive transportation investment and management approach. It is important to note that:

- The majority of the traffic on I-5 between SR 500 and Columbia Boulevard is accessing adjacent industrial, commercial and residential areas.
- Seventy percent of the southbound AM peak traffic either enters or exits I-5 in the Bridge Influence Area (BIA) with 30% of this traffic entering and exiting within the BIA.
- Eighty percent of the northbound PM peak traffic either enters or exits I-5 in the BIA area with 40% of entering and exiting within the BIA.

- I-5 carries a higher number of trucks than any other regional route, and will double by 2020. I-5 plays a critical role for both through truck traffic and access to industrial areas between Portland and Vancouver.
- The need for a full I-5/Columbia Boulevard interchange has been identified in the Transportation Element of the Comprehensive Plan, the Albina Community Plan Concept Map, and Metro's Regional Transportation Plan.
- I-5 provides the only access to Hayden Island and its residents, hotels and commercial areas.
- The Task Force's recommended transportation investments will strengthen job growth in the corridor. Modeling shows that travel time savings will result in consistent job growth in the corridor. Estimates show that depending on the level of investment, 4,000 more jobs in north and northeast Portland and 1,000 jobs in Clark County could result compared to a scenario without capacity investments in the I-5 Corridor.
- Without these investments, the result will be more dispersed patterns for population and employment growth than anticipated in current, adopted plans.
- The recommended investments support the City of Vancouver's Esther Short Subarea and Redevelopment Plan vision for Downtown Vancouver as its regional center. This vision calls for a multi-modal, active 24-hour downtown with 1,010 new housing units for 1,500 new residents and 540,000 square of commercial space for 2,700 workers.
- The recommended investments also support the transportation and distribution industrial sector as a major component of the regional economy. This region ranks first on the West Coast in terms of the value of wholesale trade per capita. The Columbia Corridor/Rivergate area and Port of Vancouver are major import auto distribution centers for Toyota, Hyundai, and Subaru. The Rivergate area is also the location of warehouse distributions for Nordstrom, Columbia Sportswear, and Meier and Frank. North and Northeast Portland and Vancouver is home to many of the region's inter-modal marine, air cargo, truck and rail terminals.
- Regional transportation plans identify the need for multi-modal investments in the I-5 Corridor, along with a mix of TSM and TDM tools to better manage traffic follows.

Regional population and employment forecasts

The Task Force transportation analysis for the various build options assumed the 20-year population and employment growth forecasts as reflected in current Metro and Clark County plans. Metro and Clark County are required by state law to provide a 20- year land supply to accommodate forecasted population growth. Both are now updating their growth forecasts and the allocations. Each is in the process of amending the Urban Growth Boundary (Metro) and Urban Growth Area (Clark County) to meet the forecasted need.

The Task Force explored the question "Why doesn't Clark County attract more jobs so that fewer people have to commute across the river?" Within the last few years, Clark County has begun to reverse trends by increasing its share of regional employment growth. Policies in Clark County, Vancouver, and other cities are intended to help attract employment. In fact, regional studies show that the availability of land for jobs in Clark County may help attract more jobs than is currently forecast. Even with a smaller percentage of the work force commuting, transportation studies show that I-5 will still be congested in the PM peak period, although the congestion may not extend over as many hours. Instead of lasting six hours in the afternoon as estimated with the current employment forecasts, an increase in employment in Clark County could reduce the afternoon peak to four hours.

The Washington Transportation Plan, state Highway System Plan and Metropolitan Transportation Plan

The Washington Transportation Plan (WTP) 2003 – 2022, was adopted by the Washington State Transportation Commission in February 2002. The WTP recognizes the significance of the I-5 Corridor to the state of Washington. The Washington State Highway System Plan (HSP) 2003 – 2022, is a component of Washington's Transportation Plan (WTP). It addresses the state's highway system. The HSP includes a comprehensive assessment of the current deficiencies and conceptual solutions for the state's highway system for the next 20 years. The I-5 Corridor throughout Clark County is identified as deficient in meeting the existing and future transportation needs.

The Metropolitan Transportation Plan, adopted by the Regional Transportation Council in December 2000, is the Clark County region's principal transportation plan, which supports the County's Comprehensive Plan. The MTP is a financially constrained plan that meets federal planning requirements for a transportation system, which could be built with revenues reasonably expected to be available to the region for transportation purposes in the next twenty years. The list of conceptual transportation projects in the MTP represents the highest priority projects for the region and includes some I-5 Trade Corridor projects.

Metropolitan Transportation Plan projects on I-5 in Washington

The MTP identifies the need for improvements in the I-5 Corridor and the need to determine the nature of the improvements as part of the Portland-Vancouver I-5 Transportation and Trade Partnership. The fiscally constrained MTP lists the following projects in the I-5 Corridor between the Interstate Bridge and I-205:

- **I-5, Salmon Creek to I-205:** Widen from 2 to 3 lanes each direction (with added HOV lane)
- **I-5/NE 134th Street:** Reconstruct interchange (per I-5/I-205 North Corridor Study recommendations). This is awaiting Federal Highway Administration (FHWA) Access Point Decision Report outcome.
- **Transit, Fixed Route System Expansion:** An increase in C-TRAN service hours that would add transit service in the I-5 Corridor.

- **High Capacity Transit Corridor:** The I-5 Corridor is one of the High Capacity Transit corridors designated in the MTP.
- **Light Rail Extension to Clark County:** Part of the designated Regional Transportation System, but is not part of the financially constrained Plan.

Clark County's Community Framework Plan

As part of Washington's Growth Management planning process, Clark County adopted a Community Framework Plan in April 1993 to serve as a guide for the County's long-term growth over fifty-plus years. The Framework Plan envisions a collection of distinct communities and a hierarchy of growth and activity centers. Land outside the population centers is to be dedicated to farms, forests, rural development and open space.

The twenty-year Comprehensive Growth Management Plan for Clark County guides growth toward the future vision. Growth management plans for the urban areas of Clark County were developed by Clark County in partnership with the cities and towns in the county. The Comprehensive Growth Management Plan for Clark County was adopted in December of 1994. Some revisions were made in May 1996 and during 1998. The plans are currently in the process of being updated.

Within the I-5 Corridor, the Community Framework Plan designated major activity centers in Downtown Vancouver and the Salmon Creek area and a Hazel Dell in Hazel Dell.

Clark County's Comprehensive Growth Management Plan and Metropolitan Transportation Plan policies

Both the Comprehensive Growth Management Plan and Metropolitan Transportation Plan for Clark County share common transportation planning policies. The I-5 Partnership recommendations are consistent with policy objectives of providing for mobility of people and freight, while reducing reliance on the single-occupant vehicle.

I-5 is designated as a Highway of Statewide Significance (HSS). WSDOT in consultation with other jurisdictions sets the level of service for HSS facilities. WSDOT has set a Level of Service (LOS) "D" for urban facilities on HSS. HSS facilities are exempt from concurrency analysis.

The focus on improving traffic operations and conditions for the Downtown Vancouver employment center and for the freight movement to and from the Port of Vancouver is consistent with the comprehensive plan and MTP to facilitate job growth in Clark County and to facilitate freight movement. The MTP meets federal Congestion Management System (CMS) requirements to develop plans to manage demand before expanding capacity to meet demand. The Task Force's TDM/TSM recommendations support the RTP policies as tools to manage demand.

Arterials adjacent to I-5 and the MTP

The efforts to maximize use of I-5 for through traffic and minimize use of other arterial roads for through traffic are consistent with the MTP. Further evaluation of the traffic impacts on arterial streets adjacent to I-5 and identification of measures to mitigate traffic impacts will be required in the EIS. Such facilities include Mill Plain and Fourth Plain.

Compatibility with adopted City of Vancouver policies

Each of the proposed improvements is generally compatible with the existing Comprehensive Plan and could be compatible with policies that are being contemplated as part of the ongoing Comprehensive Plan update process. The following comprehensive plan policies are applicable to the proposed BIA concepts.

Transportation access. The proposed improvements will considerably enhance future operating conditions of the freeway system, and indirect benefits (while also in some instances impacts) will accrue to the City's transportation system as a result. Specifically, each of the options proposes enhanced access into the City Center. As the primary regional center and a location that has been planned for considerable growth in activity of the next 20 years, the City's Downtown Transportation System Plan calls for new and enhanced access points into downtown to support the planned residential and commercial/industrial growth. Each of the BIA concepts directly improves and adds access into downtown, directly supporting the existing plans.

The City's transportation plan also contemplates a multi-modal system and relies on the growth in the multi-modal level of service to support the land use plan. Additionally, the City's Plan advances directed policies that support reductions in SOV travel, support effective use of TSM and TDM measures, and encourage growth in urban centers of activity. All of these outcomes are supported, in part, by the Task Force's draft recommendations.

Economic development. Vancouver's Plan contains policies to ensure easy access to employment centers, develop mass transit networks, and encourage priority investments in public facilities that bolster Vancouver's ability to maintain existing and attract additional employment within the City. The proposed concepts directly provide enhanced access into downtown and into the west Vancouver commercial and industrial districts by providing both reduced travel delays along the interstate system and safer interchange areas. Coupled with potential HOV lanes and LRT, the Task Force's draft recommendations also improve mode choice for access to downtown.

Cultural and historic resources. The interchange concepts that serve to directly impact or limit access to designated cultural resources would conflict with the existing City Plan. Specifically, concepts that would destruct, encroach and or appreciably change the character of the Historic Reserve and its environs would conflict with City policy and the long-terms plans for that cultural and historic resource.

The City has plans directly related to the rehabilitation and expansion of the Historic Reserve as a cultural district, and numerous transportation plan elements have laid the groundwork for road improvements within the District to enhance access into and within the Reserve environs.

Active and livable neighborhoods. The City's plans promote urban centers that are directly served by efficient transportation systems. Particular emphasis is given to improving access to multi-modal and transit networks, TDM, and supporting system development to promote reductions in SOV travel. The interchange concepts reviewed by the Task Force are supportive of these policies given the multi-modal options (namely LRT) and the improved access to and from downtown, the primary urban center, and a center where significant residential growth has been planned.

The Oregon Highway Plan

The OHP calls for a transportation system marked by modal balance, efficiency, accessibility, environmental responsibility, connectivity among places, connectivity among modes and carriers, safety, and financial stability. The OHP operates in the context of the federal Transportation Equity Act for the 21st Century, the statewide land use planning goals, the Transportation Planning Rule and the State Agency Coordination Program. The OHP carries out the Oregon Transportation Plan and will be reflected in transportation corridor plans. The Task Force's draft recommendations are generally consistent with OHP policies and goals.

Metro's 2040 Growth Concept

The 2040 Growth Concept sets the direction for planning in the Portland Metropolitan area. Local jurisdiction comprehensive plans are required by State law to be consistent with the 2040 Growth Concept. In the I-5 Corridor, the 2040 Growth Concept designated major land use areas include:

- Portland Central City
- Main Streets: Lombard, Killingsworth, Denver, Martin Luther King Jr. Boulevard
- Columbia Corridor/Rivergate Industrial Area
- Interstate MAX Station Communities
- Future Hayden Island Station Community

Metro's Regional Transportation Plan

The RTP implements the 2040 Growth Concept in the Portland metropolitan area. It identifies three different levels of plans. The "Preferred" is the most extensive and the one that best supports the 2040 Growth Concept. The "Priority" Plan includes strategic investments that, with additional funding, would support the 2040 Growth Concept. The "Financially Constrained" plan meets federal planning requirements for a transportation system that could be built with available financial resources and represents the highest priority projects for the region.

The RTP proposes a Refinement Plan for the I-5 Corridor and concludes "The level of congestion in the corridor suggests that despite a range of different improvements to the I-5 Interstate Bridges and transit service, latent demand exist in the corridor that cannot be addressed with highway capacity improve-

ments alone." Even with the projects in the "Priority" plan, "congestion exceeds proposed performance measures for the corridor. …Freight movement to inter-modal facilities and industrial areas would be affected by the spreading of congestion to off peak periods."

The RTP policies recognize that congestion must be tolerated in urban centers in order to achieve the density and mixed-use development called for in the 2040 land use designations and to avoid the use of urban land for highways. The RTP proposes levels of service standards ("LOS"), measured over two PM peak hours, for corridors that are to be determined at the completion of the corridor refinement plans. For the I-5 Corridor, the RTP proposes LOS "E" in the first hour and "F" in the second hour of the PM peak period. RTP policies tolerate less congestion in corridors in industrial area and inter-modal corridors where LOS "E" for the first hour and "E" for the second hour have been adopted. Mid-day levels of service in industrial areas are higher and call for "D" as an acceptable operating condition.

The focus of the Task Force recommendations on improving traffic operations in the Columbia Corridor/Rivergate industrial areas is consistent with the intent of the RTP to focus transportation investments in serving the movement of goods. The need to avoid spreading peak period congestion into the mid-day is also consistent with RTP policy.

The RTP meets federal Congestion Management System (CMS) requirements to develop plans to manage demand before expanding capacity to meet demand. The RTP sets modal targets for Non-SOV use for each of the 2040 design types. For the Central City, the Non-SOV modal target for daily trips is 60% to 70%. For industrial areas, the target is 40% to 45%. The TDM/TSM recommendations support the RTP policies as tools to manage demand. The RTP identifies the need for additional transit services, beyond that which can be funded with available revenue forecasts, to support the 2040 Growth Concept and the Non-SOV modal targets.

Metro's RTP projects on I-5

The RTP identifies the need for improvements in the I-5 Corridor and the need to determine the nature of the improvements in a Refinement Plan. The Regional Transportation Plan ("Priority Plan") calls for:

- **I-5 Interstate Bridge and I-5 Widening**: Add capacity to the I-5/Columbia River bridge and widen I-5 from Columbia Boulevard to the Interstate Bridge based on final recommendations from the I-5 Corridor Study. (#4003)
- **I-5/Columbia Boulevard Improvement:** Construct a full direction access interchange at I-5 and Columbia Boulevard based on recommendations from the I-5 Corridor Study. (#4006)
- **I-5 Corridor Study:** Determine an appropriate mix of improvements from I-405 to I-205, including adding capacity and transit service within the corridor. (#4009)

As a higher priority in the Financially Constrained Plan, the RTP includes:

- **Delta Park Lombard Project:** I-5 North Improvements to widen I-5 to three lanes in each direction from Lombard Street to the Expo Center exit (#4005), and

- **Light Rail Expansion:** Extend light rail service from the Rose Quarter transit center north to the Portland Metropolitan Exposition Center and then potentially to Vancouver, Washington (#1000, #1002).

Main Street projects in Metro's RTP

The I-5 Corridor has four designated "Main Streets": Lombard, Killingsworth, Denver, and Martin Luther King, Jr. Boulevard The RTP supports the "Main Street" land use designation by taking actions to discourage through-traffic on these roads. The Killingsworth and Lombard Main Streets are further supported by designations as streets for frequent bus service.

The Task Force's efforts in the BIA concepts to maximize use of I-5 for through traffic and minimize use of other arterial roads, particularly Main Streets for through-traffic, are consistent with the RTP. Further evaluation of the traffic impacts on the Main Streets and identification of measures to mitigate traffic impacts will be required in the EIS.

Compatibility with adopted City of Portland Comprehensive Plan policies

Overall, the Task Force's recommendations are generally compatible with the City of Portland Comprehensive Plan. The combination of freeway improvements and light rail transit support the diversity of existing and planned land uses. The following comprehensive plan policies are applicable to the proposed BIA concepts.

Policy 6.2 Regional and City Traffic Patterns. City policy advances the separation of traffic on different facilities according to the length of trip. Inter-regional traffic should use the Regional Transit and Traffic Way system. City streets should be designed to carry local traffic and not be designed or managed to serve as alternative routes for regional trips.

All of the proposed Task Force concepts support this policy by encouraging inter-regional traffic to use the Regional Traffic Way system and not local city streets. Concept 7 further separates local and regional traffic by providing an arterial connection for local traffic between Portland and Vancouver. The proposed concepts also include light rail, which provides a transit connection to the Regional Transit system.

Policy 6.6 Urban Form/Policy 6.9 Transit Oriented Development. Portland's policy supports a regional form of mixed-use centers served by a multi-modal transportation system. City policy also emphasizes the need for inter-connected public streets to provide for pedestrian, bicycle and vehicle access. Policy 6.9 advances the need to reinforce the connection between transit and adjacent land use through increased residential densities and transit oriented development.

The Task Force's draft recommendations also include a new light rail connection, which supports urban form and transit oriented development. Bridge Concepts 1 (a new 5-lane southbound supplemental bridge to the west of the existing bridges) and 6 (a new 4-lane collector distributor bridge to the west of the existing bridges) conflict with these policies by significantly widening the freeway corridor, diminishing the pedestrian environment, and reducing the potential for mixed-use centers and transit- oriented development, specifically on Hayden Island.

On Hayden Island, the Comprehensive Plan envisions primarily commercial land uses in the freeway corridor with residential uses to the east and west of this commercial center. Between Portland Harbor and Columbia Boulevard, the majority of the land is in the industrial sanctuary or open space with a mixture of commercial and residential uses. Additional study is required to further evaluate the appropriate level and type of future development in the Bridge Influence Area. Future plans should balance the opportunity created for station area development with the preservation of industrial activity. On Hayden Island, obstacles such as airport noise and adequacy of the local street network should be assessed in the EIS.

Policy 6.21 Freight Inter-modal Facilities and Freight Activity Areas/Objective 2.14 Industrial Sanctuaries. City policy advances the development of a multi-modal transportation system for the safe and efficient movement of goods within the City. City Policy also encourages the growth of industrial activities by preserving industrial land in Industrial Sanctuaries primarily for manufacturing purposes.

All of the proposed concepts support the projected increased freight demand for the movement of goods within the corridor. A large amount of the land surrounding the Bridge Influence Area is in the Industrial Sanctuary. Improved freeway access and operations for freight are essential to support the existing and planned industrial uses in the corridor.

Policy 8.15 Wetlands/Riparian/Water Bodies Protection. City Policy stresses the importance of protecting significant wetlands, riparian areas, and water bodies that have significant function and value related to flood protection, sediment and erosion control, water quality, groundwater recharge and discharge, education, vegetation, and fish and wildlife habitat.

All concepts have some impact on wetlands, open space and/or parks lands between Portland Harbor and Columbia Boulevard and would be in conflict with this policy. Concept 4, the Replacement Bridge, minimizes impacts in this area. Additional work is needed to assess how BIA improvements would impact water bodies, their significant functions and values.

Policy 12.1 Portland's Character. City policy advances the need to enhance and extend Portland's attractive identity. New public projects should enhance Portland's appearance and character through innovative design. This includes creating a "built environment" that is attractive and inviting to the pedestrian.

Concepts designed to minimize visual and physical impacts on the surrounding area would support this policy. Bridge concepts 1 and 6, which significantly widen the freeway corridor on Hayden Island and in the Marine Drive interchange, would conflict with this policy.

Overall I-5 land use findings: Effect of investments on growth

The analysis of the transportation options in the I-5 Transportation and Trade Partnership study assumed that the population and employment allocations in 2020 would be the same in all scenarios. Further, the analysis that the level and nature of the investment would change the modal choice, the route and the trip choice, but would not alter the number or locations of employment and households. History tells us otherwise. Transportation investments do change the location and number of jobs and households.

The I-5 Transportation and Trade Partnership study analyzed the potential effects on changes to households and employment with the I-5 investments of an additional freeway lane in the corridor and across the Columbia River, plus a light rail loop in Clark County. The findings of analysis are below.

Without changes in land use policy, the following land use development trends can be expected, regardless of the transportation actions taken in the I-5 Corridor:

- Population and employment growth in the Portland/Vancouver region are developing in a dispersed pattern. A significant share of households and employment are locating at the urban fringe, within adopted zoning.
- There will be more job growth in Clark County than anticipated in our current adopted plans. Even with a reduced percentage of commuters crossing the river, I-5 will be congested.
- Industrial areas are at risk of being converted to commercial uses, threatening the availability of industrial land in the Portland/Vancouver region and increasing traffic congestion in the I-5 Corridor.

Without investment in the I-5 Corridor, we can expect that traffic congestion and reduced travel reliability will have an adverse economic effect on industries and businesses in the corridor.

With highway and transit investments in the corridor, there will be travel-time savings that can be expected to have the following benefits:

- Attract employment growth toward the center of the region to the Columbia Corridor along the I-5 Corridor from elsewhere in the region. The land use model estimates a small by steady increase of jobs to the I-5 Corridor, in both the Columbia Corridor Industrial Area and Clark County with the additional accessibility. This is consistent with Metro's 2040 Growth Concept that supports economic growth in the industrial area and focuses growth inside existing urban areas. This is also consistent with Clark County's goals of attracting more jobs.
- Strengthen the regional economy by attracting more jobs to the region.
- Create new job opportunities for residents near the I-5 Corridor because of their close proximity to the additional employment in the Corridor.
- Support mixed-use and compact housing development around transit stations. Transit station areas can have a positive effect on encouraging redevelopment and supporting transit use, particularly in residential areas. Redevelopment can provide an additional opportunity to accommodate additional housing demand and offer a mix of housing opportunities.

Highway and transit investments in the corridor also carry risks if the development pressure associated with the increased accessibility is not well managed.

- Increased demand for housing in Clark County due to the location of jobs in the center of the region and the faster travel times to jobs in Portland may increase pressure to expand the Clark County urban growth area along the I-5 Corridor to the north. If more new houses are built than jobs in Clark County, I-5 will become overloaded to levels that would exist if no improvements were made. This would be contrary to the regional policy and limit the capacity for freight.

- Industrial areas are at greater risk of being converted to commercial uses at new and improved interchanges with the improved travel times at these locations. As the region's population has increased, the value of land along the freeway has also increased. This increase in value increases development pressure. Value and corresponding development pressure will increase as accessibility is further improved. If not protected, this development will erode the supply of increasingly scarce industrial land, reduce the opportunities to create family wage jobs close to where people live, and generate more traffic than the system can handle, even with new capacity.

Growth must be managed to ensure that:

- Clark County growth does not result in new freeway capacity being used by commuters, instead of truckers for the movement of goods.
- The expected life span of investments is not shortened.
- Scarce industrial land is not converted to commercial uses.
- Local jurisdictions implement necessary zoning and regulatory changes to attract mixed-use and compact housings around transit stations. The availability of land within the Metro UGB and the Clark County UGAs changes where and how the region will grow. If Metro has a tight UGB, it will increase demand for housing in Clark County, even more than the effect of the added accessibility due to the transit and highway investment. If Clark County expands the UGA, it will also attract growth. UGB/A decisions alone can change traffic demands across the river.

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Attachment D

I-5 Bi-State Coordination Accord

The I-5 Portland/Vancouver Transportation and Trade Partnership Task Force recommends that RTC and Metro, along with the other members of the current Bi-State Transportation Committee, adopt and implement the following I-5 Bi-State Coordination Accord and develop the operational details.

I. Purpose

The I-5 Partnership brought together Washington and Oregon citizens and leaders to respond to concerns about growing congestion on I-5 and its effect on the region. Consistent with the Task Force's "Problem, Vision and Values Statement," the Accord signatories find and adopt the following principles, statements, goals and actions:

A. The region functions as one economic marketplace nationally and internationally.

B. Travel demands in the I-5 Corridor need to be met by (1) providing a balance of transit and road improvements to achieve a mix of transportation choices, (2) reducing single occupancy vehicle use in the peak hours across the Columbia River on I-5 and I-205, and (3) reducing daily VMT per capita for the urban areas in the four-county region.

C. The region relies on the efficient movement of freight throughout the I-5 Corridor. Mid-day travel speeds for trucks on I-5 and I-205 must be maintained at a level designed to protect and enhance freight mobility. Additionally, the region should proactively work to increase travel reliability for all users.

D. Healthy and viable rail service in the I-5 Corridor is a critical component of the regional economy. It is an integral part of the region's comparative advantage in providing an inter-modal focus of marine, barge, highway, and rail services that contribute to the Portland/Vancouver area's recognition as a major national and international trade and distribution center.

E. Transportation Demand Management (TDM) and Transportation System Management (TSM) are essential strategies for improving our mobility, both on a Corridor and regional level.

F. The region's growth management plans share a common vision for compact urban growth to preserve farm land, forest land and open space.

G. The region's transportation and land use systems are integrally related, each impacting and influencing the other, with different approaches and implementation regulations.

H. Coordination among region's jurisdictions and agencies in pursuing economic development and the preservation and increase of available industrial lands are important parts of growth management and maintaining a strong economy.

I. The region would benefit from a multi-faceted, integrated plan of personal and business actions/incentives, transportation policies, and capital expenditures.

J. Plans to manage the I-5 Corridor interchanges, adjacent areas, and adjacent industrial lands are needed now to efficiently manage and protect the existing and future investments in the transportation system.

K. The recommended improvements in the I-5 Corridor between Portland and Vancouver will be an expensive undertaking. Capital projects of the magnitude recommended by the Task Force typically require a variety of funding and financing mechanisms. The region will not be able to rely on any single revenue source. There are several promising federal, state and local revenue sources that could be available for financing the proposed projects.

II. Mechanisms for protecting the I-5 Corridor

The "I-5 Corridor" or "Corridor" for purposes of this Accord has as its northern terminus the northern boundary of Clark County. Its southern terminus is the I-5/I-405 loop.

A. **Manage land uses.** Accord signatories with land use authority, in consultation with those signatories with transportation authority, agree to protect the I-5 Corridor by creating their own plans and agreements to (1) manage traffic from land uses surrounding interchanges not to exceed the mobility standard for the interchange (2) manage induced traffic growth in the Corridor beyond that already planned, (3) establish "centers" for intense development and identify those areas preserved for industrial, residential and other uses, and (4) manage the employment or industrial areas that are outside of designated "centers" where traffic from potential development could negatively impact the levels of service on I-5 or the roads leading to it. These plans and agreements will include TDM/TSM strategies, consistent with and designed to achieve, the I-5 Corridor and regional TDM/TSM targets.

B. **Protect existing, modified and new interchanges.** Accord signatories with I-5 Corridor interchanges physically located in their jurisdiction agree to manage the development and resulting traffic around the interchange areas to protect the mobility standard of the interchange and enter into agreements with the relevant DOT. The plans and agreements for the interchanges will specify land uses that are consistent with this Accord.

C. **Transit station areas.** Accord signatories with new light rail and transit stations will adopt plans for the areas around transit station that are consistent with this Accord.

D. **TDM/TSM actions.** Accord signatories will do their part in implementing TDM/TSM strategies that are consistent with Corridor and regional targets.

E. **Selection of strategies and regional consistency**. Each Accord signatory will determine its specific strategies to protect the I-5 Corridor. The strategies should be consistent with the applicable Clark County Comprehensive Plan or the Metro 2040 Growth Concept, as modified. After consultation with the Bi-State Coordination Committee, each Accord signatory with land use authority shall adopt the relevant elements of the Section II plans and agreements into their Comprehensive Plan or Growth Concept Plan.

III. Create "Bi-State Coordination Committee"

The existing "Bi-State Transportation Committee" advises the JPACT/Metro Council and the RTC Board on transportation issues of bi-state significance. It is the only existing forum for discussion of bi-state issues where members represent a balance of regional interests. A new level of bi-state coordination is needed to advise the JPACT/Metro Council, the RTC Board and Clark County on (1) increasing travel demands across the Columbia River and (2) accommodating the 20-year regional projections for population and employment, and jobs and housing. Jurisdictions and agencies in the I-5 Corridor and those that impact its function should supplement their current transportation coordination efforts with coordinated land use planning, TDM/TSM measures, and economic development activities designed to, among other things, effectively manage the existing and new I-5 Corridor transportation investments.

A. **Role of the new Bi-State Coordinating Committee**

(1) **Review, comment and recommend.** Review, comment and provide recommendations, consistent with this Accord, on actions and major transportation, land use, TDM/TSM, and economic development issues of Bi-State Significance to the responsible signatory. Additionally, the Committee can request any Accord signatory to refer an issue or action of major bi-state significance to it for consultation.

(2) **Rail.** Establish a public/private Bi-State Rail Forum to serve as an advisory group. Through the Rail Forum, initiate an aggressive program to:

(a) facilitate the efficient rail movement of freight

(b) coordinate multi-modal transportation services to increase port access and streamline freight movement

(c) develop strategies to implement the specific findings of the I-5 Partnership Rail Capacity Study, including prioritizing and scheduling the "incremental improvements"

(d) pursue the rail infrastructure improvements required to accommodate the anticipated 20-year freight rail growth in the Corridor and frequent, efficient inter-city passenger rail service between Seattle, Portland and Eugene

(e) advocate at federal, state, regional and local levels for the funding and implementation of rail projects, including the need for additional inter-city passenger and high speed rail

(f) negotiate the cost allocation responsibilities between public and private stakeholders.

(3) **TDM/TSM.** Establish a Bi-State TDM Forum to serve as an advisory group. Work with the regional transportation partners to prepare an "I-5 TDM/TSM Corridor Plan" to identify the TDM/TSM targets, implementation details, funding sources, priorities, and costs. Upon its completion, review the plan, finalize both Corridor and regional targets, and lead the effort to secure additional funding.

(4) **Funding.** Identify opportunities to fund the widening of I-5 to 3 lanes between Delta Park and Lombard. Other capital elements of the recommendations will take longer to fund. As a first step towards the development of a financing plan, work to explore long-term funding opportunities. Coordinate and discuss efforts to increase transit operating revenue for TriMet and C-TRAN.

(5) **Community enhancement fund.** Establish a community enhancement fund for use in the impacted areas in the I-5 Corridor in Oregon and Washington. Such a fund would be in addition to any impact mitigation costs identified through an environmental impact statement and would be modeled conceptually after the "1% for Arts" program, the I-405 Mitigation Fund and the St. John's Landfill Mitigation Fund. The Bi-State Coordination Committee will recommend the specific details in conjunction with the Environmental Justice Work Group.

B. **Rights and responsibilities of Accord signatories.** Each signatory:

(1) Retains the right and responsibility to control its own transportation system, planning, economic development, funding priorities and enforcement.

(2) Agrees, prior to adopting management plans, interchange plans and agreements, and transit station plans, to bring them and other actions and issues of major bi-state significance to the Bi-State Coordinating Committee for its comments and recommendations, which the signatories will meaningfully consider.

C. **Membership and coordination.** Currently, the Bi-State Transportation Committee members are elected representatives or directors from: the Cities of Portland and Vancouver, Clark and Multnomah Counties, a smaller city in Clark (now Battle Ground) and one in Multnomah County (now Gresham); ODOT, WSDOT, the Ports of Vancouver and Portland, TriMet, C-TRAN and Metro. Membership in the Bi-State Coordination Committee should be expanded to include

members of the public, and others as needed, to meet the Accord responsibilities while maintaining the existing balance of bi-state representation of interests.

D. **Revise existing Bi-State Transportation Committee.** JPACT/Metro Council, the RTC Board and Clark County should revise the existing "Bi-State Transportation Committee" to be consistent with this Accord. Simultaneously, the Accord signatories need to create the new "Bi-State Coordination Committee," provide for citizen participation in its work, adopt this Accord, and agree to act consistently with it.

IV. Actions and issues with major bi-state significance

The Accord signatories find and adopt the following as issues of major bi-state significance:

A. Plans and agreements for the I-5 Corridor noted in Section II above and the actions noted in Section V below.

B. Four county regional coordination of UGB/UGA expansions to accommodate 20-year projections for population and employment, along with jobs and housing.

C. Coordination of economic development strategies and the preservation of industrial lands.

D. Highway, transit and rail projects in the Corridor, along with TDM/TSM targets and strategies for the Corridor and bi-state region.

E. Other related major issues of bi-state concern.

V. Actions needed before new capacity in the I-5 Corridor

A. As to **new river-crossing capacity**, **new or modified interchanges**, or **transit stations**, the Accord signatories agree to adopt drafts of the plans, agreements and actions noted in Section II above, include them for review in the relevant environmental process, and finalize them if not already finalized, as part of the environmental process conclusion.

B. As to the **Delta Park to Lombard project specifically**, it is subject only to (1) formation of the Bi-State Coordinating Committee and (2) the Bi-State Coordination Committee's review of the relevant environmental documents. The Accord signatories will, however, consult with each other and the Bi-State Coordination Committee before taking any official action that changes existing land use designations in the areas adjacent to the Delta Park Lombard project if those changes could adversely affect the mobility standard of the interchange. Additionally, the Accord signatories agree to have the plans, agreements and actions noted in Section II above in place or included for review in the relevant environmental process for any new river-crossing capacity, and finalize them if not already finalized, as part of the environmental process conclu-

sion. This includes the City of Portland's agreement to develop a plan to manage the area around the interchanges in the vicinity of Delta Park consistent with this Accord.

C. As to the **WSDOT 99th to I-205 widening project specifically**, the environmental work has been completed. As a result, its construction is conditioned only upon the Accord signatories agreement to consult with each other and the Bi-State Coordination Committee before taking any official action that changes existing land use designations in the areas adjacent to that project. However, the Accord signatories agree to have the plans, agreements and actions noted in Section II above, in place or included for review in the relevant environmental process for any new river-crossing capacity, and finalize them if not already finalized, as part of the environmental process.

D. As to **existing interchanges**, the Accord signatories agree to have the plans, agreements and actions noted in Section II above adopted with all deliberate speed.

E. As to **any other transportation improvements** in the I-5 Corridor, the Accord signatories agree to have the plans, agreements and actions noted in Section II above adopted before construction begins on them.

F. As to **TDM/TSM**, the proposed Bi-State Coordination Committee needs to agree on the "I-5 TDM/TSM Corridor Plan," the TDM/TSM targets for the I-5 Corridor and region, and the appropriate levels of financial commitment and implementation that must be in place before construction begins on any new river-crossing capacity.

VI. Implementation

A. **Timing**. Signatory parties should establish the new Bi-State Coordination Committee as soon as possible, but in any event, it should be established contemporaneously with the adoption of the I-5 Task Force Recommendations into the regional transportation plans.

B. **Staffing and funding.** Metro and RTC should continue to staff the Bi-State Coordination Committee and explore whether additional funding is necessary until the Accord's organizational details are finalized.

Attachment E

TDM/TSM Action Items and Rough Costs Matrix

I. Alternative mode services

Action item	Current / budgeted spending	Target / additional spending	Who pays
A. Fund transit services to the level assumed in the Task Force Baseline, upon which other Option Packages were compared. Today the region provides 1.9 million hours of transit service annually. The recommendation scenarios by the Task Force assumed 4.3 million service hours by 2020.	• C-TRAN (Year 2002) 282, 400-fixed-route service hours at $23.5 m/year for transit operations • TriMet (Year 2002) 1.6 million fixed-route service hours at $139 m/yr	• The operating and maintenance cost needed for the baseline service in 2020 is estimated at $317 M/yr. To meet this service level TriMet would need an additional $132 M/yr and C-TRAN would need an additional $23 M/yr.	• Users • Private sector • Public sector
B. Increase the subsidy for the existing C-TRAN Vanpool program to add to fleet and increase service over next five years.	• C-TRAN: $200K/yr operating costs • TriMet: $100K/yr	• C-TRAN: $600K/yr to triple fleet	• Users • Private sector
C. Study the use of casual carpool and pick-up locations to cross the river.	• $0	• $40K	• Public sector
D. Support the planned expansion of the existing Real Time Information for users.	• TriMet: $2 M/yr	• TriMet: $1 M/yr	• Users • Private sector • Public sector
E. Create and expand use of flexible shuttle systems to supplement fixed route services between the employment areas and the LRT stations in Vancouver and Portland.	• C-TRAN: $0 • TriMet: $200K shuttle/worksite	• C-TRAIN and TriMet: $1 M combined budget	• Private sector

II. Alternative mode support

Action item	Current / budgeted spending	Target / additional spending	Who pays
A. Make available new park and ride facilities in Clark County in conjunction with recommended and new transit services in the I-5 and I-205 corridors. Begin Park and Ride expansion with those facilities forecasted to be at capacity in the next five years.	• 1,700 spaces currently exist in Clark County. Another 700 will be added with construction of the I-5/99th Park-n-Ride.	• Overall need: 6,600 spaces in Clark County. The additional 4,200 spaces cost $84 M ($20K/space x 4,200 spaces). 1,000 spaces ($20 M) are currently assumed in projected LRT costs.	• Users • Private sector • Public sector
B. Increase funding at the jurisdiction level to ensure that existing pedestrian-oriented street designs in neighborhoods within the I-5 Corridor may be implemented to support connectivity to the corridor.	• Retrofit at $1 M for 1/4-mile section. New construction at $1.25 M for 1/4-mile section.	• $16 M for 4 miles of boulevard retrofits	• Private sector • Public sector
C. Support a sustained marketing program to increase awareness of rideshare programs, for example www.CarpoolMatchNW.org. Target the I-5 Corridor.	• $116K ($80K for staff, $36K for ads) for two years	• Continue and increase budget to $150K to target I-5	• Public sector
D. Establish and fund an ongoing HOV enforcement program.	• ODOT: $50K – $60K/yr • WA State Patrol in charge of enforcement	• ODOT: increase to $100K • WA: increase to $100K	• Users • Public sector
E. Improve connectivity and quality of bike/ped facilities in Portland and Vancouver at both ends of any new river crossing.	• $25K. Lloyd District TMA received $7,500 regional money for bike racks in 2001.	• City of Vancouver: $2.5 M	• Public sector
F. Support existing plans for end of trip facilities (e.g., showers, lockers, bike racks) by committing the funding for these in the corridor.	• Portland spent $9,500 on bike racks and $5,477 on lockers in 2001* • WA: $0	• Portland increases budget to $35K/yr • WA budget: $75K	• Users • Private sector • Public sector
G. Develop TDM programs for special event centers that draw large number of attendees, e.g., Delta Park, Expo Center, PIR, Downtown Vancouver. This will be similar to the shuttle bus and traffic signal coordination implemented for Rose Quarter events.	• TriMet: $5K – $10K/yr	• Increase budgets in both WA and Portland to $300K	• Users • Private sector • Public sector

* Lloyd District TMA revenue: City of Portland $75K; Passport Commissions $31,500; CMAQ grant $15K; BID funding $50K; contributions $2,600

II. Alternative mode support (cont.)

Action item	Current / budgeted spending	Target / additional spending	Who pays
H. Expand the TDM Education program for the region and target special programs for the I-5 Corridor. Examples of education programs are: (1) School programs on Alternative Travel Modes. (2) Identify people who are open to making changes to the way they travel and link them with the resources they need to do it (e.g., Travel Smart program, Perth). (3) Encourage families to live without a second car (Way to Go Seattle).	• City of Portland spent $15K for bikes and helmets plus $80K for staff for elementary school bike & ped training in 2001.	• $1.2 M	• Private sector • Public sector
I. Develop Guaranteed Ride Home Program for employees who have gotten to work by alternatives to SOV. Employees are offered a ride home (e.g., taxi, company vehicles) at no cost if needed for an emergency.	• Minimal cost (+/- $200/yr)	• $30K/yr	• Public sector

III. Worksite-based strategies

Action item	Current / budgeted spending	Target / additional spending	Who pays
A. Expand region-wide incentive strategy to encourage employers to offer commute options. This will include promoting education programs tailored to the work sites in the corridor. Add marketing FTE for bus pass marketing.	• TriMet: $400K • WA: $0	• TriMet: $500K • C-TRAN: $100K/yr	• Private sector • Public sector
B. Subsidize transit pass program (like the TriMet Passport) to increase transit use at employment sites.	• City of Portland's TRIP (transit subsidy) and carpool check program cost $340K in 2001 • WA: $0	• $5 M • WA Budget: $450K	• Private sector
C. Increase participation in bike-walk use at more worksite locations, e.g., Bike & Walk Bucks.	• Bike & Walk Bucks pays participant $30/month • Average 500 participants = $180K/yr	• Increase use to 1,000 participants = $360K/yr	• Private sector

IV. Public policy and regulatory strategies

Action item	Current / budgeted spending	Target / additional spending	Who pays
A. Expand the funding for the two existing TMAs in the corridor, Swan Island and Lloyd Center, and use public funds to seed new TMAs where business support exists.	• Lloyd District TMA budget: $174K* • Swan Island TMA** budget: $75K	• Create and maintain 4 TMAs total. Increase budget to $175K = $700K	• Private sector • Public sector
B. Review enforcement or incentive mechanism to achieve the goals in Washington State's CTR and Oregon's ECO programs to reduce commuter SOV trips.	• $0	• $300K	• Private sector • Public sector
C. Expand CTR to include businesses with 50 or more employees. CTR currently impacts businesses with 100 or more employees. ECO and CTR to move toward common criteria to include businesses with 50 employees or more.	• $0	• $40K	• Private sector • Public sector
D. Expand transit free fare areas including downtown Vancouver.	• City portion of Fareless Extension to Lloyd District was $300K. Total cost $900K. • WA: $0	• Future costs based on TriMet's estimate of lost revenue. • WA: $300K	• Private sector • Public sector
E. Study expansion of free fare zones for I-5 transit users.	• $0	• $150K	• User • Private sector • Public sector

* Lloyd District TMA revenue: City of Portland $75K; Passport Commissions $31,500; CMAQ grant $15K; BID funding $50K; contributions $2,600

** Swan Island TMA revenue: CMAQ grant $25,500; access to work (carpool and shuttle) $10,500; membership dues $25,750

V. Pricing strategies

Action item	Current / budgeted spending	Target / additional spending	Who pays
A. Develop a region-wide parking strategy to encourage fewer parking spaces and to support parking charges. Consider including elements of the strategy such as: (1) Establish trip reduction ordinances to help reduce SOV trips. (2) Support jurisdictions in adopting parking requirements in codes with parking minimums and maximums in place. (3) Provide preferential parking at places of employment and at parking garages for rideshare vehicles as an incentive. (4) Increase the effectiveness of existing pricing strategies by increasing the cost of metered parking and parking garages.	• Portland discounts carpool parking on streets and garages: total $377,472/yr • On-street spaces: 618 • City-owned garage spaces: 217 • City of Vancouver's parking program costs: $2 M/yr	• $500K	• User • Public sector
B. Study opportunities to implement road-pricing strategies as plans for a new river crossing continue. Pricing strategies for consideration to be looked into through EIS.	• $0	• $500K	• User • Private sector • Public sector

VI. TSM strategies

Action item	Current / budgeted spending	Target / additional spending	Who pays
A. Add service patrols to manage incidents in Washington and add to the number of incident response teams in Oregon and Washington.	• COMET operating costs: $85K/ truck, $7,550 maintenance and gas, 5K miles/month/per truck		• Public sector
B. Improve freight traffic flow by moving more drivers from SOV to alternative modes, thereby reducing traffic congestion. As designs for the new river crossing and interchanges in the corridor are developed, truck bypass lanes at ramps and other techniques to facilitate truck movement should be considered.			• Public sector
C. Accelerate funding for planned ramp metering at all WSDOT freeway interchanges in the I-5 and I-205 corridors.	• Ramp meters cost $90K–$100K/unit (includes meter, signage and striping	• $700K for 7 meters	• Public sector
D. Increase coordination between Oregon and Washington Transportation Management Centers to improve freeway management and operations, including incident management. The aim is to decrease the time to clear incidents, maintain traffic flow and increase travel reliability.	• OR: • WA: 30 minutes response and 120 minutes clearance time for major incidents	• $600K for first year and $100K annually for following years	• Public sector
E. Implement Vancouver Area Smart Trek (VAST) System. VAST is a package of Intelligent Transportation System (ITS) elements to better manage the transportation system. ITS uses advanced technology and information to improve mobility and productivity and enhance safety on the transportation system. http://comsvr/vastrek/	• $5.4 M (3-yr budget)	• $45 M over 20 years	• Public sector

Attachment F

Potential Impacts of Recommendations to be Assessed in an EIS

I. Traffic/transportation

A. Clark County

(1) **Increase/decrease in access to jobs and services for low income, minority groups, disabled and elderly.** Need to assess:

(a) Ability to access jobs/employment centers. How will each alternative reduce or increase job opportunities or require dislocating families in order to maintain access?

(b) Choice in transportation within each community and in crossing the river. Large segments of the EJ communities do not drive (particularly women of ethnic groups), do not have reliable cars, or are from cultures that are more comfortable using public transportation.

(c) Availability of public transportation to reach community services. Services in Clark County are not currently always accessible by transit. Low income and minority groups are located throughout the community.

(d) Impact on pedestrian and bicycle access.

(e) Affordability of transportation to jobs and services.

(f) Efficiency of transportation to jobs and services.

(2) **Construction impacts.** Need to assess ability to maintain access to jobs and services during construction.

(3) **Reduced safety in neighborhoods.** Need to assess:

(a) Impact on pedestrian safety. Walkability of neighborhoods is especially important for children and elderly.

(b) Increase in cut-through traffic.

(c) Impact on speeds through neighborhoods, for instance potential impacts of new bridge over 29th in Vancouver.

(4) **Reduced access to homes.** Need to assess impact on residents of changing how homes are accessed (rear access to homes between 35th–37th Street).

B. Portland

(1) **Increase in traffic on local streets and other freeway systems.** Need to assess:

(a) The local traffic impact of removing the bottleneck at Delta Park.

(b) The local traffic impact of making improvements in the Bridge Influence Area.

(c) Impact of freeway ramp meter rates on local streets and on pedestrian safety issues.

(d) The impact of improvements on the Portland freeway loop, SR 500 and SR 14.

(e) Traffic impacts of HOV system.

(f) West Arterial Road as an alternative to improvements on I-5.

(2) **Increase in sprawl in Clark County.** Need to assess the impact of transportation improvements on growth in Clark County.

(3) **Unsustainable transportation system.** Need to assess transit and demand management-only transportation system.

(4) **Unsafe pedestrian conditions during construction.** Need to assess to the extent that construction of improvements impact pedestrian safety and access, it needs to be mitigated. This can be a problem on local streets and also at freeway ramps when traffic backs up. Senior populations are particularly a concern.

II. Environment and health

A. Clark County

(1) **Increase in air and other pollution and subsequent health impacts.** Need to assess:

(a) Health impacts on residents next to or near the facilities due to increases in air pollution and the potentially subsequent increases in contamination of soils and other resources with which residents interact. The assessment should recognize that:

– Children are most vulnerable because they play outside.

– Low income populations have less access to health care and thus may have poorer overall health.

– Health issues of concern include allergies, asthma, lead poisoning, and low birth weights.

(2) **Increased noise.** Need to assess health impacts of increased noise.

(3) **Impacts to other environmental resources.** Need to assess:

(a) Impact on trees — reduction and health of trees.

(b) Reduction in wildlife.

(c) Stormwater drainage.

(d) Water quality.

(e) Sustainable development.

(f) Other natural resources.

B. Portland

(1) **Increase in air pollution and subsequent health impacts.** Need to assess:

(a) Local air quality impacts of highway and transit projects, including an assessment of air toxics. The assessment should also take into account idling traffic at ramp meters.

(b) Health impacts associated with increased air pollution due to highway and transit projects.

– Note: There is concern in the community about the cumulative impacts of automobile and industrial pollution on the health of residents in north and northeast Portland. Advocates on this issue have requested a study of the cumulative air quality impacts. Such a study will require the participation of several state and federal agencies including the Department of Environmental Quality, the Oregon Health Department, and the Environmental Protection Agency. Additional discussion among these agencies and with the community advocates is needed before action on such a study can be taken.

(2) **Increase in pollution to streams and fish.** Need to assess:

(a) Increase in run-off into streams due to the increase impervious surface (more roadway).

(b) Increase in PCBs and toxic organics in streams. Need to pay attention to detection limits.

III. Historic and cultural issues

A. Clark County

(1) **Impacts on historic homes.** Need to assess older Vancouver neighborhoods that have historic homes.

(2) **Impacts on culture of minority and ethnic groups.** Need to assess impacts on the ability of minority and ethnic groups to maintain the cohesiveness and culture of their communities.

(3) **Impacts on Native American tribal resources.** Need to assess impacts that a river crossing or other elements of the alternatives may have on Native American fisheries.

B. Portland

(1) **Impacts to Pioneer Cemetery.** Need to assess whether impacts will occur to this resource.

IV. Property impacts

A. Clark County

(1) **Residential and commercial displacements.** Need to assess:

(a) Displacements and encroachments—low-income households in this corridor are difficult

to relocate because of a lack of decent, affordable housing.

(b) Impact on availability of affordable housing.

B. Portland

(1) **Residential and commercial displacements.** Need to assess:

(a) Displacements and encroachments to residential, business and commercial property.

(b) Impact on property values.

(c) If there is a loss of housing, need to consider the cumulative impacts of all projects in the area.

V. Quality of life

A. Clark County

(1) **Impacts to community life.** Need to assess:

(a) Impacts to community cohesiveness—connections within neighborhoods. This includes pedestrian, bike and vehicle connections within the community and to schools, recreation, community and commercial services.

(b) Connection impacts to other communities.

(c) Impacts to adopted Neighborhood Plans.

(d) Diminishment of community identity, such as of historic character of older Vancouver neighborhoods.

(e) Impacts to community life of minority groups.

(f) Increase in brownfields or rundown and/or vacant properties.

(g) Changes, such as access, within neighborhoods that develop housing pockets that could attract criminal activities into neighborhoods

(2) **Increase in noise.** Need to assess noise impacts of potential improvements.

(3) **Impacts to open space and parks.** Need to assess:

(a) Loss of green space, wetlands and parks.

(b) Access to open space and parks.

(4) **Decrease in overall livability.** Need to assess:

(a) Increase in odors.

(b) Visual impacts

B. Portland

(1) **Increase in noise.** Need to assess:

(a) Noise impacts of potential improvements including widening I-5 to three lanes between Delta Park and Lombard.

(b) Noise impacts due to construction.

(2) **Decrease in overall livability.** Need to assess:

(a) Loss of green space.

(b) Shadow effect of freeways and loss of natural light.

(c) Visual impact of new bridges.

(d) Loss of access to the Columbia Slough.

(e) Increase in litter due to light rail and increased traffic.

(f) Increased grit and grim on homes and vehicles near the corridor.

VI. Employment and economic opportunity

A. Clark County

(1) **Impacts on job opportunities due to access.** Need to assess increase or decrease in reliable transportation access to jobs for low income and minority communities.

(2) **Economic development in Clark County.** Need to assess:

(a) Effects of alternatives on creation of jobs in Clark County.

(b) Impacts on tax revenues for Clark County.

B. Portland

(1) **Decrease in revenue for corridor businesses due to construction.** Need to assess construction impacts to businesses affected by construction of improvements.

(2) **Lack of economic benefit to local community from EIS, construction and maintenance contracts.** Need to ensure that the Departments of Transportation make a special efforts in the following areas: attracting Disadvantaged Business Enterprise (DBE)-eligible firms for all contracts; attracting Emerging Small Businesses for all contracts, and enforcing external equal employment opportunities laws.

VII. Affected environmental justice and Title IV communities

A. Clark County

(1) **Balance of impacts.** Need to assess the demographics of those impacted by the study— who, how many, and of what racial, ethnic and economic groups—in order to determine whether impacts are balanced and what mitigation could be appropriate.

Attachment G

Potential Benefits of Recommendations to be Considered in an EIS

The following information may be used as a basis for exploring benefits in the EIS. The EIS will assess whether environmental justice communities carry an unfair share of the negative impacts of the project, and whether the impacts are or can be balanced by benefits to those communities.

It is important to understand that although impacts would be a natural outcome of transportation improvements, not all benefits would be. The working groups discussed two types of benefits: (1) those that could be a direct outcome of transportation improvements, and (2) those that could be added either to address specific impacts (as mitigation) or to provide overall balance of benefits and impacts to affected communities. The second type would not be ensured until they were included in the final EIS and financing package.

I. Employment/economic opportunity

A. Clark County

(1) **Maintain and improve access to employment centers and high quality jobs.**

(a) Provide reliable, efficient access to key employment areas (such as Ridgefield, Prune Hill, Portland, Port of Vancouver). Need transportation choices: car and transit.

(b) Encourage the creation of jobs in Clark County/Southwest Washington.

(a) Support job training opportunities.

(2) **Support job opportunities during construction**.

(a) Use local contractors and suppliers.

(b) Maintain access to employment centers during construction.

(3) **Encourage the development of local businesses in the corridor**.

(a) Encourage business development for minority groups along the corridor.

(b) Support economic development plans in local Neighborhood Action Plans.

B. Portland

(1) **Provide jobs from the project.**

(a) Improvements should serve as an economic engine by providing jobs and business opportunity to the adjacent communities.

(b) Employment and training and percentage people of color used on project—contracts/workers.

(c) Also percentage of small businesses, women in business.

(d) ODOT should participate in Community Benefits Agency Task Force. Though not yet formally established, ODOT and all other agencies undertaking major public works projects in the area should participate when it is set up. The Task Force will serve as a forum where public agencies and potentially other institutions can share information regarding how their capital improvement projects can best benefit the community. Community benefit objectives can be served by aggressive local hiring/contracting efforts, and there are many other "best practices."

(2) **Help businesses that may be impacted during construction**.

(a) Develop a plan to save jobs during construction. Use lessons learned during Interstate LRT. Look for federal grants now. Don't wait.

(b) Look at how to compensate small business people who lose business.

(c) To help businesses that may be impacted during construction, it is important to get profit and loss statements before construction so that there is a way to determine loss of business during construction.

(d) EPA may have a small business loss income fund that will reimburse any loss that businesses can prove during construction.

(3) **Encourage the development of local businesses in the corridor**.

(a) Set aside space at light rail stations for small, community-oriented, local businesses and connect these businesses with job training center efforts.

(b) Incentives along corridor to help businesses.

II. Traffic/transportation

A. Clark County

(1) **Provide for diverse mobility and access needs of environmental justice communities:**

(a) Jobs. See "Employment/Economic Opportunity. "

(b) See "Health and Community Services" and "Environment."

(c) Community access. See "Community Building and Livability."

(d) Maintain access across the river as a plus for both sides of the river—Portland and Vancouver are culturally and economically linked communities.

(2) **Improve bike and pedestrian safety and increase connectivity**.

(a) Improve or provide more connections crossing the freeway for pedestrian and bike access.

(3) **Reduce single-occupancy vehicles to reduce related impacts on neighborhoods and the environment**.

(a) Consider employer-to-employee incentives, such as transit vouchers. This can be a tax incentive for employer and could help meet community trip reduction goals.

(b) Consider Downtown Vancouver free zone on buses.

(c) Consider using project to facilitate better ride sharing.

(d) The more public transportation that is available, the more people will ride.

(4) **Improve transit availability and connections**.

(a) Need efficient east-west transit in Clark County to create better access to jobs and services.

(b) More available transit can benefit certain ethnic groups. For some groups who are new to the country, driving is a major obstacle; they have used public transportation—trains and buses —in home country and are more comfortable with transit due to familiarity. Light rail or rail type system would be more inviting.

(c) Consider transit passes for special populations.

(d) Public transit needs to be done well (go where people want to go).

(e) More information on public transportation is needed for EJ communities.

(5) **Calm traffic through neighborhoods**.

(a) Build on Vancouver neighborhoods program of student-designed traffic signs.

B. Portland

(1) **Improve bike and pedestrian safety and increase connectivity.**

(a) Freeway over-crossings are dangerous for bicyclists and pedestrians. Need safe ways to get across freeway, particularly for seniors. There is also a problem crossing at freeway ramps when traffic backs up.

(b) Safer and better bike and pedestrian access to transportation. Emphasize bike and pedestrian facilities in design and mitigation. Need pedestrian and bike friendly overpasses to tie communities back together.

(c) Safer bike/pedestrian access should be emphasized in design for neighborhood.

(d) A new pedestrian/bicycle trail/path connecting Bridgeton to the Expo Center MAX station.

(e) Improve the pedestrian condition of Killingsworth, per the planning work currently underway and led by the Portland Office of Transportation.

(f) Consider integrating I-5 improvements identified in the recently completed *Station Area Revitalization Strategy* into the long-range I-5 Partnership Plan. The strategy identifies the following improvements:

– A new Buffalo Street pedestrian/bicycle freeway crossing.

– Enhanced Killingsworth and Skidmore freeway crossings to make them more pedestrian

friendly (widened sidewalks, landscaping, benches, etc.).

- A possible freeway capping at the Killingsworth crossing.
- A new street crossing to connect Mississippi District (south of Skidmore).

(2) **Improve transit connections**.

(a) Develop better inter-neighborhood transportation in N/NE, for example, streetcars and other alternative modes.

(b) Need improved east-west transit through N/NE Portland to create better access to jobs, shopping, recreation, etc.

(c) Free bus passes to students up to age 22.

(3) **Manage traffic through better land use planning**.

(a) Coordinate land use and transportation to limit sprawl in Clark County and thereby reduce commuters through north Portland.

(4) **Improve congestion**.

(a) Eliminate bridge lifts.

III. Health and community services

A. Clark County

(1) **Improve access to health care and human services.**

(a) Reliable transportation is needed to medical / healthcare resources.

(b) Residents of low-income communities have less health insurance and access to health care.

(c) Consider supporting childcare and facilities in neighborhoods.

(d) Community resource centers could be built in neighborhoods.

(e) Provide easy access to senior community centers in the neighborhoods.

(2) **Improve education on health risks**.

(a) Education is needed on freeway-related health impacts for families within two miles of the corridor.

B. Portland

(1) **Improve access to health care for pulmonary problems.**

(a) Residents of low-income communities have less health insurance and access to health care.

(b) There needs to be consideration of air quality impacts so insurance community will pay for asthma as a long-term health issue.

(2) **Improve lead testing and education**.

(a) Test children and homes and educate to prevent lead poisoning.

IV. Environment

A. Clark County

(1) **Promote natural resource improvement.**

(a) Implement as community projects.

(b) Partner with organizations such as WSU on environmental stewardship.

(2) **Increase green spaces**.

(a) Plant more trees.

(b) Acquire green space.

B. Portland

(1) **Improve knowledge of air quality impacts.**

(a) Establish additional air quality monitoring stations along the freeway corridor.

(b) Study the cumulative effects of automobile and industrial emissions, including an assessment of how the emissions impact different age groups and pregnant and nursing women.

(c) Improved information on air quality will help people make informed choices and can be used to get DEQ to "dial down" impacts from industry; communicate and educate people.

(2) **Improve air quality now and during construction**.

(a) Make sure construction vehicles are up to air quality standards while they are building in the area.

(b) Have DOTs work with environmental agencies/transit to create incentives for reduction of air pollutants, e.g,. clean buses.

(3) **Treat runoff from impervious services**.

(a) Runoff control measures such as berms and swales to capture pollution before it goes into streams.

V. Property benefits

A. Clark County

(1) **Housing**

(a) Preserve low-income housing.

(b) Provide home enhancements, such as added insulation, to offset noise, air pollution, etc.

(c) For displaced families with attachments to home and neighborhood, consider moving houses to a vacant property in close location

B. Portland

(1) **Housing**

(a) Preserve low-income housing (incentive programs).

VI. Community building and livability

A. Clark County

(1) **Foster the ability of the low-income and minority communities to become more engaged in the community.**

(a) Promote capacity of low-income and minority groups to become involved in public discourse. Develop their capacity to be effective citizens and self advocates so they can be empowered to affect their quality of life.

- Possibly partner in outreach and education with Clark College and/or WSU Vancouver.
- Promote knowledge of government services (police, etc.), programs and policies intended to support the community.

(b) Promote and support community-action, community-betterment projects that improve the quality of the community, bring the community together, and educate. Examples cited include:

- Tree planting programs (such as the programs for disadvantaged youth sponsored by the Forest Service).
- Community art programs to represent the character of the community—with art by the community. This could be done in conjunction with sound wall design or light rail stations, and would promote pride and discourage graffiti
- Traffic calming signs made by kids.

(c) Public transportation fosters more interaction between diverse cultures and segments of the community.

(2) **Improve community connectivity and amenities**.

(a) Provide more connections across freeway for pedestrians, bikes, etc.

(b) Consider capping I-5 for connectivity and open space and to addresses noise/ pollution.

(c) Need more parks, gardens and greenspace.

(d) Improve aesthetics, such as with artwork on sound walls. Express the diversity and the unique feel of each neighborhood.

(3) **Strengthen schools and public education**.

(a) Mitigation could include support for schools along freeway, which are the most diverse and have some of the highest rates of poverty.

(b) Community-action projects described in the previous section could be organized through the schools and build on educational goals.

(4) **Create a mitigation fund**.

(a) Consider creation of a mitigation fund that could be used for community-led projects.

(b) Focus of any environmental justice mitigation should be on the EJ communities and households affected by any negative impacts.

B. Portland

(1) **Improve/add community amenities.**

(a) Plan for adding green space with project and improving the green and community spaces we have.

(b) Add libraries, lighting, drinking fountains, Saturday market, and micro-economic space.

(c) Public improvements along the Columbia Slough. The community has identified several priority projects in this area, including the 40-mile loop trail, canoe launch, etc.

(2) **Improve existing community resources**.

(a) Funding for Jefferson and Roosevelt school cluster (elementary-high school). These have the most diverse population, and values clash. Cultural center, day care, immigrant services.

(3) **Create a mitigation fund**.

(a) Consider creation of a mitigation fund, similar to the fund that ODOT established as mitigation for the west-side I-405, or the North Portland Trust Fund that Portland International Raceway (PIR) set up to mitigate for noise impacts.

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Attachment H

Outreach to Environmental Justice Communities during the EIS

A. Clark County

(1) **Improve community capacity to participate in process.**

(a) Many EJ communities do not understand their opportunities to be involved and affect the process.

(b) Potential of negative impacts could help mobilize and unite community to address the problem.

(2) **Apply environmental justice in its fullest sense.**

(a) Environmental Justice Executive Order refers only to low-income and minority, but Title 6 covers more. We need to consider elderly, disabled and non-English speaking.

(3) **No one approach will work for all. General tools could include:**

(a) Schools can be a source of disseminating information, but children may not, or in some cases should not (see #6 below), communicate back to parents.

(b) Local newspapers and newsletters specifically for targeted groups; media for non-English speaking community members cover the Portland/Vancouver area.

(c) Posters at local businesses catering to low-income and minority communities—grocers, restaurants, etc. (many located on 4th Plain Blvd.).

(d) Neighborhoods have been established for a long time and can assist in outreach (as a supplemental effort). Rosemere neighborhood translates newsletter in Spanish and Russian.

(e) C-TRAN has changed advertising policy and will now accept public service ads.

(4) **De-centralized methods of outreach are needed to reach low-income communities.**

(a) Poverty located all over Clark County, not centrally located. They are a significant part of most of the neighborhoods along the corridor.

(b) Large pockets in Hazel Dell and Mill Plain, 136th Avenue to 18th Street. Poor section of town is.

(c) Transients/homeless are mostly found in the area close to rail, transportation hub, and move around a great deal.

(d) Free/reduced lunches indicate the rate of poverty—55% of students in Vancouver schools can qualify for this program. Battle Ground and Evergreen have 30%.

(e) Head Start has 1,000 families. This number is only the ones they serve; know that there is a waiting list.

(f) May be able to contact through the schools.

(g) C-TRAN has changed advertising policy and will now accept public service ads.

(5) **Recognize diversity of non-English speaking groups.**

(a) Primary non-English speaking groups are:

- Eastern European— many languages but usually speak Russian.
- Hispanic.
- Vietnamese, Korean, Cambodian.

(b) Most of these are located around the I-5 corridor, because it is the cheapest area to live in.

(c) Schools along corridor have much diversity.

(d) Headstart students in Clark County: 16% is non-English speaking, 10% is Russian.

(e) Washington Elementary Schools: 23% Hispanic, 7% African American, 3% Asian American.

(6) **Establish culturally sensitive, community-based outreach programs.**

(a) Find out what methods are most effective for each cultural group.

(b) Materials should be culturally relevant.

(c) Some cultures (Hispanic and Eastern European) are leery of government, so approach needs to be non-threatening.

(d) Liaisons from the affected groups that speak their language are good resource.

(e) Programs for refugee placement may be a good way to communicate.

(f) Schools can be a way of disseminating information. Consider consulting students about the project, and recognize that for several ethnic groups, children should not be used as tools to translate to or reach parents, either because it is degrading to parent or it is an inappropriate role for the children.

(g) Minority and ethnic groups generally identify themselves as a Portland/Vancouver community. They do not draw a line at the river.

(7) **Reach Russian/Eastern European communities.**

(a) Schools are "the authority" —the best source of information about and to the community.

(b) Collaborate with the schools and existing community leaders.

(c) Do not go through the churches; they are sacred.

(d) Door-to-door approach works as long as you have an interpreter.

(e) Do not use children as interpreters.

(f) Post information at other agencies that serve these populations.

(g) Large Russian population goes to Clark College. Acceptable outreach there.

(h) Russians won't use celebrations to get information.

(8) **Reach Spanish-speaking communities.**

(a) More than 90% of the Hispanic community Spanish-speaking along I-5, near corridor for commuting to and from Oregon.

(b) 85% of Hispanic community is 1st generation with little to no English skills.

(c) 99% are below federal guidelines for poverty.

(d) Over 90% mono-language (Spanish only).

(e) Over 90% are intergenerational, so there are school-age children in most families.

(f) Focus is survival for today for family.

(g) Literature is not effective because most are not literate in English or Spanish.

(h) Radio is effective way to reach.

(i) Community meetings: won't share information, but will take information. Not considered public involvement.

(j) Don't use children as tools to reach them.

(k) Celebration of food / dancing good way to get large gathering.

(l) Transportation is issue to Hispanic. Majority of women and mothers do not drive.

(m) Hispanic newspaper, Portland resource.

(n) Use Cinco de Mayo celebration for outreach Hispanic

(9) **Reach the African-American community.**

(a) Use churches.

(b) Contact church leaders first.

(c) Use newsletters, such as NAACP newsletter.

(d) Portland / Vancouver economic status for African Americans about the same.

(e) Roosevelt Elementary greater population of African American immigration from Portland coming.

(10) **Reach the Asian American community.**

(a) Asian population low.

(b) Vietnam celebrations good.

(c) Korean church community.

(d) They keep a low profile, but are here.

(11) **Elderly and disabled access to the process.**

(a) Disabled/elderly depend on public transportation.

(b) Mentally ill population also ride buses and homeless in downtown and around servicing programs.

(12) **Partner with existing community groups that have established relationships with the EJ communities.**

(a) Consult/partner to determine best ways of reaching different groups. For example:

- SEA MAR
- Lutheran Family Services
- Catholic Family Services
- Eastern European Council
- Refugee Referral Program
- INR booklet – get this as a resource!
- Independent Living Resources (people with disabilities)
- Elderly: Talk to Vancouver housing authority. Also have data.
- Ombudsman
- Vancouver Office of Mediation (for data on neighborhoods conflict resolution process)
- YWCA Diversity Task Force
- Southwest Washington Medical Center, Marcia Maynard
- New American Social & Cultural Assistance (NASCA), Kim Le
- City of Vancouver Office of Neighborhoods
- Community Outreach Panel, Kim Kapp, City of Vancouver Police
- Minority Youth Leadership Program, Jessica Mata, Children's Home Society
- Clark County Cultural Competency Committee, Renata Rhodes
- Human Services Council in Vancouver, Community Information and Referral service
- SW Washington Health District, for data on the health of our community
- Bureau of Indian Affairs
- VHA—serves many disabled persons

B. Portland

(1) **Improve community capacity to participate in project.**

(a) Many EJ communities are aware but not confident enough to get involved.

(b) Build leadership in communities. Provide opportunities to learn about and develop skills in urban planning, transportation, social justice, environmental justice, and cross-cultural political involvement. Build leadership by experiencing projects—internships, etc. [People exhibited considerable enthusiasm for this suggestion in particular and gave it three stars even though no stars were given as a part of the process.]

(c) The project is too lengthy to keep neighborhood together. Get a community center meeting place open and start training before construction. It could provide technical training and a place for community togetherness. Have it follow through the process and open for people with information on the project.

(d) Help neighborhood associations with technical assistance and training improve ability to participate and to build leadership.

(2) **Establish culturally sensitive, community-based outreach program.**

(a) Hire community outreach workers who are bilingual, bicultural, etc.

(b) Partner with existing community groups (Schools Uniting Neighborhoods, EJAG, IRCO, Community Alliance of Tenants, etc.) to do outreach and get word out about the project.

(3) **Build community and one-on-one relationships.**

(a) More extensive outreach through building relationships. TV shows on public cable access as an example to get the dialogue started.

(b) Go to the places where people naturally gather to talk about the project rather that making them come to you, e.g., churches, grocery stores, community centers, laundromats.

(c) Partner with the Oregon Food Bank to put information in food baskets, or be there when people come to get baskets.

(d) Use door-to-door canvassing to reach residents. This could include community surveys to assess attitudes.

(e) Individual invitation to participate. Establish small but consistent relationships one-on-one.

(f) Participate in community fairs, e.g., Good in the Hood.

(4) **Have tangible, accessible displays.**

(a) Put models of the project in libraries so people can see what it would look like.

(b) Portable geographic information system (GIS) so information on designs, impacts and benefits can be presented at kiosks, community events, or door- to-door. Coordinate information with other projects to show full community impacts.

(c) Commission local artist to create a big, interactive, 3 dimensional, traveling display that could also get feedback and collect data.

(d) Take out interesting and interactive displays with a live person to discuss the issues.

(e) Have school kids participate in bridge design process. Get architects from the community to volunteer time to work with the kids. Involve kids from alternative schools too.

(5) **Make information and bureaucracy understandable.**

(a) Create glossary of terms.

(b) Need a matrix of all of the agencies/partners/community organizations/people that need to collaborate on this project.

(6) **Use community media to reach people.**

(a) Community media—Portland Cable access reader boards, KBOO, KMHD.

(b) Put together a program for cable access where they come to the community.

(c) Use the alternative and mainstream media to run stories, e.g., television, radio, newspapers.

(7) **Involve the community in decision-making.**

(a) Want to see people of color, small businesses, and the disadvantaged—people representative of people in the community on board from beginning to end.

(b) Continue to have the public involved in the project's organizational structure. For example there should be an overall public involvement group and an EJ public involvement group, and analysis group composed of residents should be considered.

(c) Task Force needs to hear from the community to present EJ issues to the community.

(8) **Ensure culturally sensitive communication with immigrant groups. Reach low income more regardless of their ethnic background, find creative ways.**

(a) The following are immigrant groups in N/NE Portland that may have language barriers: Russians, Hmong, Latino, and French-speaking West Africans. The City of Portland has a good model for outreach with these groups. Contact Bureau of Environmental Services.

(b) Experience indicates that many immigrant groups have a high distrust of government and that the most effective way to communicate with these residents is through one-on-one conversations. It is important also to have community leaders involved.

Attachment I

Promising Financing Sources

A summary of the promising financing sources for highway and transit improvements is presented below. More information about the sources follows, on pages I-2 through I-6.

Source	What can it be used for?
I. Federal revenue	
A. Federal High Priority Project Authorization	Highway capital
B. Federal Discretionary Earmark	Highway capital
C. New Starts Discretionary (Sec. 5307)	Transit capital
D. New Program Authorization	Highway and transit capital
II. State revenue	
A. State allocation of federal funds	Highway and transit capital
B. Gas tax, weight mile tax, and/or diesel tax	Highway capital
C. Vehicle Registration Fee	Highway capital
D. Tolls	Highway capital
E. Lottery funds, Oregon only	Transit capital
F. Transportation Reinvestment Account	Highway and transit capital
III. Regional / local revenue	
A. Regional allocation of federal funds	Highway and transit capital
B. Regional Vehicle Registration Fee, Oregon only	Highway capital
C. Regional Finance Authority, Washington only	Highway capital
D. Property tax	Highway and transit capital
E. Basic transit sales tax, Washington only	Transit operations and capital
F. High capacity transit sales tax, Washington only	Transit operations and capital
G. Motor vehicle excise, Washington only	Transit operations and capital
H. Payroll tax, Oregon only	Transit operations
I. Fare box revenues	Transit operations

I. Federal revenue sources

Source	What can it be used for?	Revenue potential	Notes	Currently authorized?	Popular vote needed?	Legislation needed?
A. Federal High Priority Project Authorization	Highway capital	Varies. See notes.	Projects are identified and authorized once every six years in the federal transportation bill. Most allocations are small. In the current bill, Oregon and Washington's largest project amounts were $19 M and $27 M, respectively.	Yes	No	Yes (federal)
B. Federal Discretionary Earmark	Highway capital	Varies. See notes.	Congress identifies projects every year. Amounts can vary. In Oregon, discretionary grants have ranged from $2 M/yr to $5 M/yr year over the last 4 years. Washington has received about $13 M per year over the last 4 years. Programs that have been earmarked in recent years include Borders and Corridors program, Intelligent Transportation Systems program, and the Bridge program.	Yes	No	Yes (federal)
C. New Starts Discretionary (Sec. 5307)	Transit capital	Varies. See notes.	Federal “new starts” funds available to build fixed guideway projects such as light rail and busway. Must be approved by FTA and by Congress. TriMet expects to receive about $70 M/yr in appropriations to fund light rail projects in the region. This is the maximum amount that the region can expect to receive today. The match ratio is about 60% federal to 40% local.	Yes	No	Yes (federal)
D. New Program Authorization	Highway and transit capital	Unknown	Establish new federal program targeted at major interstate facilities with multiple transportation issues: auto, freight, river navigation, railroad and aviation. Seek special authorities to establish public/private ventures.	No	No	Yes (federal, possibly state)

II. State revenue sources

Source	What can it be used for?	Revenue potential	Notes	Currently authorized?	Popular vote needed?	Legislation needed?
A. State allocation of federal funds	Highway and transit capital	Varies. See notes.	Each state receives a yearly allocation of federal funds for transportation projects. Oregon receives about $277 M/yr; Washington receives approximately $500 M/yr. There are a number of restrictions on the use of these funds, but in both states it would be possible to dedicate a portion of these funds over a period of years to improvements proposed for the I-5 Corridor. Special federal programs also allow for bonding of this revenue source.	Yes	No	No
B. Gas tax, weight mile tax, and/or diesel tax	Highway capital	Washington: 1-cent = $32 M/yr Oregon: 1-cent = $22 M/yr	Both Washington and Oregon support their freeway system through gas taxes and diesel or weight-mile taxes. The states share these revenues with cities and counties. In Washington, they are also used for ferries and special grant programs. A new 1-cent gas tax, with its equivalent diesel or weight mile tax, dedicated to projects statewide, could be bonded to raise $350 M in Washington and $250 M in Oregon. If Portland and Vancouver regions received a share based on population, this would result in approximately $21 M for Vancouver and $87 M for Portland.	Yes	No	Yes (state)
C. Vehicle registration fee	Highway capital	Washington: $5 = $27 M/yr Oregon: $5 = $20 M/yr	Oregon and Washington also support their freeway system through a vehicle registration fee. The states typically share these revenues with cities and counties. In Washington, they are also used for ferries and the Washington State Patrol. A new $5 vehicle registration fee, dedicated to projects statewide, could be bonded to raise $300 M in Washington and $230 M in Oregon. If Portland and Vancouver received a share of this revenue based on population, this would result in approximately $18 M for Vancouver and $80 M for Portland.	Yes	No	Yes (state)

II. State revenue sources (cont.)

Source	What can it be used for?	Revenue potential	Notes	Currently authorized?	Popular vote needed?	Legislation needed?
D. Tolls	Highway capital	$2/vehicle = $48 M/yr on I-5	The 1997 Oregon Legislature authorized a toll project on the interstate system in Portland. In Washington, the Washington Transportation Commission is already authorized to toll new bridges. Federal law allows tolls on bridges, provided that funds are used first for replacement/rehabilitation of the tolled bridge. Inflating the 1956 toll of $0.40 to today's dollars results in a $2.20/vehicle round-trip toll. Such a toll would raise about $48 M/yr in gross revenues. Net revenues would be somewhat lower. If bonded, this source could raise approximately $500 M.	Yes	Likely	Likely state and federal
E. Lottery funds (Oregon only)	Transit capital	Varies. See notes	The Oregon Legislature authorized $125 M in state match for Westside MAX. State will pay $10 M/yr between 2000 and 2010 in lottery funds to pay back bonds. Oregon Legislature also committed $35 M to Washington County commuter rail. Concept could be continued beyond 2010.	Yes	No	Yes (state)
F. Transportation reinvestment account	Highway and transit capital	$23 M/yr on transportation investment activity of $450 M/yr	Concept is to identify income tax revenue derived from transportation investment activity. It should only be applied to new revenue/expenditures. The "identified revenue" would then be included in the state budget as a General Fund allocation to transportation spending.	No	Unlikely	Yes (state)

III. Regional/local revenue sources

Source	What can it be used for?	Revenue potential	Notes	Currently authorized?	Popular vote needed?	Legislation needed?
A. Regional allocation of federal funds	Highway and transit capital	Varies. See notes.	Both Portland and Vancouver receive an annual allocation of federal funds for transportation projects. Vancouver receives approximately $6 M/yr, and Portland about $26 M/yr. In both states it would be possible to dedicate a portion of these funds over a period of years to improvements proposed for the I-5 Corridor. Special federal programs also allow for bonding of this revenue source.	Yes	No	No
B. Regional vehicle registration fee (Oregon only)	Highway capital	$15/yr = $20 M/yr	State law authorizes the Portland region to charge a vehicle registration fee for road projects in Multnomah, Washington and Clackamas counties. No such authority exists in Vancouver.	Yes	Yes	No
C. Regional Finance Authority (Washington only)	Highway capital	$15/yr = $20 M/yr	Authority for regional financing tools currently does not exist in Washington. The Legislature has been receptive to the concept for the Puget Sound area.	No	Yes	Yes (state)
D. Property tax	Highway and transit capital	Varies. See notes.	In both states with voter approval, a local property tax can be used to pay back bonds for capital debt.	Yes	Yes	No
E. Basic transit sales tax (Washington only)	Transit operations and capital	0.1% = $4 M/yr	C-TRAN has authority to issue a sales tax of up to 0.9% to fund basic transit operations and capital needs including bus service, park and ride lots, bus acquisitions, etc. C-TRAN is currently using 0.3% of this authority. An increase in this taxing authority requires voter approval.	Yes	Yes	No
F. High capacity transit sales tax (Washington only)	Transit operations and capital	0.1% = $4 M/yr	C-TRAN has the authority to issue a sales tax of up to 1% to fund the capital and operations of a high-capacity transit system. Voter approval is required. This taxing authority has not been used to date. Note: the law authorizing this taxing authority also provided that the county may use 0.1% of the 1% for law and justice.	Yes	Yes	No
G. Motor vehicle excise (Washington only)	Transit operations and capital	0.1% = $2 M/yr	C-TRAN has authority to issue a local motor vehicle excise tax of up to 0.8%. They are currently not using this authority. A popular vote would be required.	Yes	Yes	No

III. Regional/local revenue sources (cont.)

Source	What can it be used for?	Revenue potential	Notes	Currently authorized?	Popular vote needed?	Legislation needed?
H. Payroll tax (Oregon only)	Transit operations	0.1% = $22 M/yr	TriMet is using all of its legislature-approved authority. Would need additional authority from Oregon Legislature to increase the payroll tax.	Yes	No	Yes (state)
I. Fare box revenues	Transit operations	C-TRAN: 5-cent increase = $180K TriMet: 5-cent increase = $1.5 M	Voter approval is not needed to raise fares. This is done by action of the C-TRAN or TriMet board.	Yes	No	No

Glossary

Baseline 2020. Includes the funded projects in No Build 2020 and the projects listed in the Region's 20-year plans: widening I-5 to 3 lanes in each direction between Delta Park and Lombard in Portland, widening I-5 to 3 lanes in each direction between 99th and I-205 in Vancouver, the West Hayden Island Bridge, increased basic transit service throughout the Region, increased TDM/TSM throughout the Region, and other transit and highway capital projects outside the I-5 Corridor that are planned but unfunded.

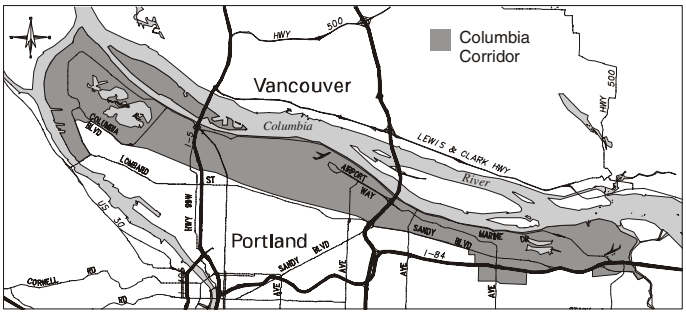
BIA. Bridge Influence Area.

Bridge Influence Area. The I-5 Corridor between Columbia Boulevard in Portland and SR 500 in Vancouver. Includes light rail between the Expo Center in Portland and Downtown Vancouver. See Attachment B.

BSNF. Burlington Northern and Santa Fe Railway Company.

CO. Carbon monoxide. A colorless, odorless, poisonous gas. Vehicular emissions are a major source.

Columbia Corridor. See map.



EA. Environmental Assessment.

EIS. Environmental Impact Statement.

Express Bus / 3 Lanes Option Package. Includes the connection of the express bus service in Clark County with the Portland metropolitan LRT system. Also includes a new supplemental I-5 bridge for express bus, HOV, and vehicular traffic.

Express Bus / 4 Lanes Option Package. Includes widening I-5 to add a fourth lane in each direction between 134th in Clark County and the Fremont Bridge in Portland that would operate as an HOV lane during peak periods. Also includes connecting express bus service in Clark County with the Portland metropolitan LRT system.

HOV. High occupancy vehicle.

I-5 Trade Corridor. See map, page 1.

JPACT. Joint Policy Advisory Committee on Transportation. Makes recommendations to Metro.

Light Rail / 3 Lanes Option Package. Development of an LRT system in Clark County connecting to the Portland metropolitan LRT system along I-5 and I-205. Also includes a new supplemental Columbia River bridge. Two variations of the bridge have been studied: (1) a joint-use bridge for LRT and motor vehicle traffic and (2) an LRT-only bridge.

Light Rail / 4 Lanes Option Package. Development of an LRT system in Clark County connecting to the Portland metropolitan LRT system along I-5 and I-205. Also includes adding a fourth lane in each direction along I-5 from 134th Street in Clark County to the Fremont Bridge in Portland for HOV, express lanes, or freight use.

LRT. Light rail transit.

MAX. Metropolitan Area Express is TriMet's light rail system and serves the greater Portland metropolitan area.

NEPA. National Environmental Policy Act.

New West Arterial Road Option Package. Includes a new arterial road along the existing railroad corridor and N. Portland Road between Mill Plain Boulevard in Vancouver and US 30 in Portland.

No Build 2020. Includes these currently funded projects: construction of Interstate MAX light rail from the Rose Garden to the Expo Center in Portland, widening I-5 to three lanes in each direction between 99th and Main in Vancouver, and other transit and highway projects outside the I–5 Corridor that have funding for construction over the next four to six years.

NOx. Nitrogen oxides. Vehicular emissions are a major source. Can cause respiratory problems.

ODOT. Oregon Department of Transportation.

Option Packages. The sets of improvements evaluated by the Task Force: Express Bus/3 Lanes, Light Rail /3 Lanes, Express Bus/3 Lanes, Light Rail /4 Lanes, and West Arterial.

RTC. Regional Transportation Council.

SR. State Route.

SOV. Single occupancy vehicle.

TDM. Transportation demand management. Purpose is to reduce, shorten or eliminate auto trips. Includes increasing number of persons per vehicle, influencing the time of or need to travel, the use of transit, carpooling, vanpooling, telecommuting, compressed work weeks, and flexible work schedules.

Transit. Public transportation system for moving passengers, for example, bus, light rail, streetcar.

TSM. Transportation system management. The purpose is to increase efficiency.

UP. Union Pacific Railway Company.

VMT. Vehicle miles traveled.

VOC. Volatile organic compound. Vehicular emissions are a major source. Can cause respiratory problems.

WSDOT. Washington State Department of Transportation.

Columbia River CROSSING

Attachment B

Statement of Purpose and Need

Columbia River CROSSING

I-5 Columbia River Crossing
Statement of Purpose and Need

Project Purpose

The purpose of the proposed action is to improve Interstate 5 corridor mobility by addressing present and future travel demand and mobility needs in the Columbia River crossing Bridge Influence Area (BIA). The BIA extends from approximately Columbia Boulevard in the south to SR 500 in the north. Relative to the No-build alternative, the proposed action is intended to achieve the following objectives: a) improve travel safety and traffic operations on the Interstate 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 Interstate 5 river crossing's structural integrity.

Project Need

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

- **Growing Travel Demand and Congestion:** Existing travel demand exceeds capacity in the I-5 Columbia River crossing and associated interchanges. This corridor experiences heavy congestion and delay lasting 2 to 5 hours during both the morning and afternoon peak travel periods and when traffic accidents, vehicle breakdowns, or bridge-lifts occur. Due to excess travel demand and congestion in the I-5 bridge corridor, many trips take the longer, alternative I-205 route across the river. Spillover traffic from I-5 onto parallel arterials such as Martin Luther King Boulevard. and Interstate Avenue increases local congestion. The two crossings currently carry over 260,000 trips across the Columbia River daily. Daily traffic demand over the I-5 crossing is projected to increase by 40 percent during the next 20 years, with stop-and-go conditions increasing to at least 10 to 12 hours each day if no improvements are made.

- **Impaired freight movement:** I-5 is part of the National Truck Network, and the most important freight freeway 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 connection to the Port of Vancouver and Port of Portland facilities located on the Columbia River as well as the majority of the area's freight consolidation facilities and distribution terminals. Freight volumes moved by truck to and from the area are projected to more than double over the next 25 years. Vehicle-hours of delay on truck routes in the Portland-Vancouver area are projected to increase by more than

90 percent over the next 20 years. Growing demand and congestion will result in increasing delay, costs and uncertainty for all businesses that rely on this corridor for freight movement.

- **Limited public transportation operation, connectivity and reliability:** Due to limited public transportation options, a number of transportation markets are not well served. The key transit markets include trips between the Portland Central City and the City of Vancouver and Clark County, trips between North/Northeast Portland and the City of Vancouver and Clark County, and trips connecting the City of Vancouver and Clark County with the regional transit system in Oregon. Current congestion in the corridor adversely impacts public transportation service reliability and travel speed. Southbound bus travel times across the bridge are currently up to three times longer during parts of the am peak compared to off peak. Travel times for public transit using general purpose lanes on I-5 in the bridge influence area are expected to increase substantially by 2030.

- **Safety and Vulnerability to Incidents:** The I-5 river crossing and its approach-sections experience crash rates nearly 2.5 times higher than statewide averages for comparable facilities. Incident evaluations generally attribute these crashes to traffic congestion and weaving movements associated with closely spaced interchanges. Without breakdown lanes or shoulders, even minor traffic accidents or stalls cause severe delay or more serious accidents.

- **Substandard bicycle and pedestrian facilities:** The bike/pedestrian lanes on the I-5 Columbia River bridges are 6 to 8 feet wide, narrower than the 10-foot standard, and are located extremely close to traffic lanes thus impacting safety for pedestrians and bicyclists. Direct pedestrian and bicycle connectivity are poor in the BIA.

- **Seismic vulnerability:** The existing I-5 bridges are located in a seismically active zone. They do not meet current seismic standards and are vulnerable to failure in an earthquake.

Columbia River CROSSING

Attachment C

Task Force Vision and Values Statement

Columbia River CROSSING

700 WASHINGTON STREET
VANCOUVER, WA 98660
360-737-2726 | 503-256-2726

Task Force Vision and Values Statement

ADOPTED

10-12-05

PURPOSE

The Columbia River Crossing Task Force Vision and Values Statement provides the foundation for developing criteria and performance measures that will be used to evaluate the I-5 Bridge Influence Area alternatives. The Columbia River Crossing Project NEPA process will include consideration of: crossing infrastructure; multimodal transportation; connectivity; high capacity transit; land use; funding; community and business interests; under-represented, low income and minority communities; commuter and freight mobility; maritime mobility; and the environment.

VISION

The Columbia River Crossing project will be developed through an inclusive and collaborative process that considers and gives weight to the work of the I-5 Trade and Transportation Partnership and delivers a financially feasible solution that sustains and stimulates a healthy community by addressing its mobility and transportation needs, increasing its business success and family prosperity, protecting its natural resources, and enhancing its quality of life.

VALUES

The Columbia River Crossing project should reach this vision through:

Community Livability

- Supporting a healthy community.
- Supporting a healthy and vibrant land use mix of residential, commercial, industrial, recreational, cultural, and historic areas.
- Supporting aesthetic quality that achieves a regional landmark.
- Recognizing the history of the community surrounding the I-5 bridge influence area, supporting improved community cohesion, and avoiding neighborhood disruption.
- Preserving parks, historic and cultural resources, and green spaces.

Mobility, Reliability, Accessibility, Congestion Reduction and Efficiency

- Providing congestion reduction and mobility, reliability, and accessibility for all users, and recognizing the requirements of local, intra-corridor, and interstate movement now and in the future.

- Providing an efficient transportation system through transportation system management, encouraging reduced reliance on single occupant vehicles, incident management, and increased capacity measures.

Modal Choice

- Providing modal choice for users of the crossing, including highway, transit, high-capacity transit, bicycle, and pedestrian modes.

Safety

- Ensuring safety for vehicles (trucks, autos, emergency, and transit), pedestrians, bicyclists, river users, and air traffic at the crossing.

Regional Economy; Freight Mobility

- Supporting a sound regional economy and job growth.
- Enhancing the I-5 corridor as a global trade gateway by addressing the need to move freight efficiently and reliably through the I-5 bridge influence area, and allowing for river navigational needs.

Stewardship of Natural and Human Resources

- Respecting, protecting, and improving natural resources including fish, wildlife habitat, and water quality.
- Supporting improved air quality.
- Minimizing impacts of noise, light, and glare.
- Supporting energy efficiency through design, construction, and use.

Distribution of Impacts and Benefits

- Ensuring the fair distribution of benefits and adverse effects of the project for the region, communities, and neighborhoods adjacent to the project area.

Cost Effectiveness and Financial Resources

- Ensuring cost effectiveness in design, construction, maintenance, and operation.
- Ensuring a reliable funding plan for the project.

Bi-State Cooperation

- Fostering regional cooperation and planning.
- Supporting existing growth management plans in both states.
- Supporting balanced job growth.

Columbia River CROSSING

Attachment D

Screening and Evaluation Framework

Columbia River CROSSING

Screening and Evaluation Framework

This framework establishes a logical process for narrowing (or screening) the large number of transportation components that will be generated at the outset of the project. The framework also establishes criteria and related performance measures to:

- Measure the effectiveness of components and subsequent alternative packages in addressing the problems identified in the *Problem Definition*, and
- relate the degree to which community values as identified in the CRC Task Force's V*ision and Values Statement* are achieved.

The project will use the same criteria throughout the process. However, measures for gauging the performance of alternatives against the criteria will become successively more specific and may be modified as more detailed data becomes available.

Through successive screening, the most promising components are packaged into viable alternatives. These are then narrowed further to provide alternatives to be considered in the Draft Environmental Impact Statement (DEIS). Components and alternatives that do not pass from one screening level to the next will be dropped from further consideration. Ultimately, the evaluation criteria will be used to support selection of a preferred alternative.

Generation of Components

The I-5 Transportation and Trade Partnership *Final Strategic Plan* provided recommendations to shape transportation improvements on I-5 between Columbia Boulevard in Portland and State Route (SR) 500 in Vancouver, an area referred to as the "bridge influence area." However, many of the recommendations were not specific, leaving many ways to package and implement solutions. In addition, new ideas requiring further evaluation may surface through the National Environmental Policy Act (NEPA) scoping process.

Schedule

The project team will follow this screening schedule:

- Feb/April 2006 — Component screening and packaging of remaining components into alternatives to be evaluated further
- Late fall 2006 — Screening of alternatives and deciding which alternatives will be evaluated in the Draft Environmental Impact Statement (Draft EIS)
- Early 2008 — Selection of a preferred alternative

The evaluation framework is comprised of three elements, which are attached:

Contents

The following materials comprise the remainder of this framework:

- **Glossary of terms**
- **Overall Steps in the Screening and Evaluation Process**
- **Component Screening Step A**
- **Component Screening Step B**

(Criteria from Step B are also used during the alternative package screening and selection of a preferred alternative)

Glossary of Terms

Component- A specific idea proposed to address one or more of the identified needs in the I-5 bridge influence area. For example, each of several viable river crossing ideas is a separate component under the "river crossing" category.

Transportation Category- Components are organized and screened among eight (8) transportation categories based on the nature of the component. For example, all transit components (bus, light rail, other) are organized within the "transit" category and all river crossing components within the "river crossing" category. Due to their common reliance on highway and bridge facilities, bicycle, pedestrian, and freight components will be screened jointly with roadway and river crossing categories.

Screening- The process of assessing and narrowing the range of components and alternative packages relative to established screening criteria and documentation of the screening process and resulting outcomes. Screening represents the body of work completed in forming the range of alternatives to advance into the EIS. Component screening occurs within and not across transportation categories. Alternative packages are screened relative to one another.

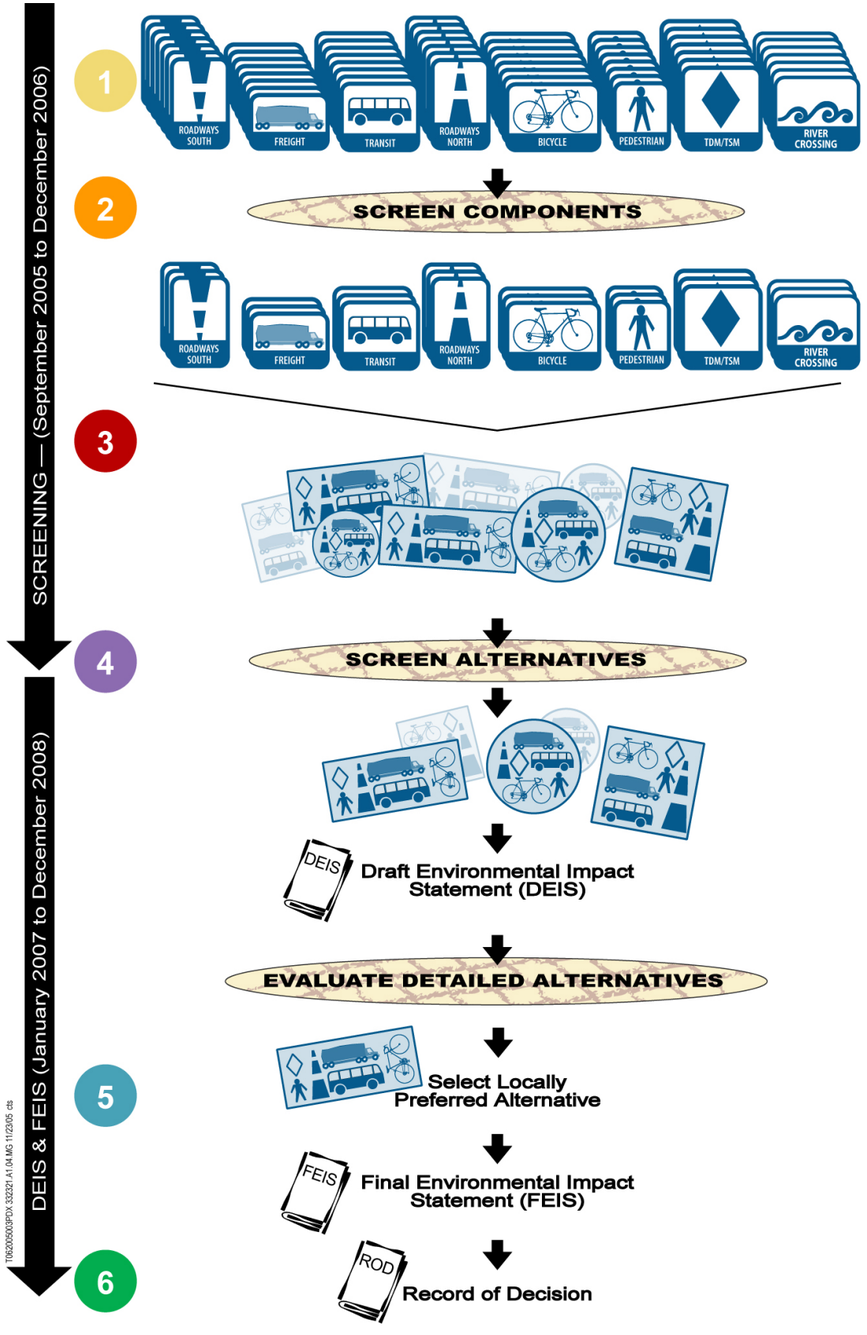
Criteria- Principles reflecting the CRC Task force adopted *Vision and Values Statements* by which components and alternative packages will be considered.

Performance Measure- Used to assess the degree to which the established criteria are satisfied. Measures are mostly qualitative during component screening given limited available data and become more quantitative during alternative package screening and selection of a preferred alternative as detailed data is generated.

Alternative- The end result of the screening process, each alternative is a carefully matched and fully formed assembly of components intended to address the project purpose and need and allow for comparison of performance relative to established evaluation criteria.

Evaluation- Different and distinct from screening, evaluation is the process of comparing and contrasting the adopted range of alternatives during the EIS, leading to selection of a preferred alternative. Performance measures at this stage are the most quantifiable.

Scoping Process- A process for early identification of potentially significant environmental issues and suggestions for potential improvements. This process begins with a project/process introduction to the environmental review agencies and the public, initiating coordination and involvement activities that will span the life of the project.



Steps in the Screening and Evaluation Process

1 Identify Transportation Components

To begin, a wide range of improvement ideas (or components) will be generated from two sources: (1) recommendations in the 2002 I-5 Transportation and Trade Partnership Final Strategic Plan; and (2) additional suggestions from the public and affected agencies received during the National Environmental Policy Act (NEPA) scoping process. The project team will organize these components into transportation categories to make the process of screening the components more clear: Roadways North, River Crossing, Roadways South, Freight, Transit, Bicycle/Pedestrian, and Transportation Demand Management (TDM)/Transportation System Management (TSM).

2 Screen Components

Component screening occurs using a two-step process (Steps A and B) for each component within the above categories to successively narrow the number of possible solutions. **Step A** is a pass/fail process in which transportation components are screened against questions derived from the *Problem Definition* (See attachment *Step A: Component Screening*). To determine if each component offers an improvement, they will be compared to the No Build condition. Components that pass in Step A will be evaluated further against **Step B** criteria that were developed to reflect values identified in the CRC Task Force's V*ision and Values Statement* (See attachment *Step B: Component Screening*). Project staff will rate each of the remaining components numerically on an established scale (for example 1-5) using data drawn mostly from previous studies. They will identify components that perform better than others in each category and recommend which components to advance for inclusion in alternative packages. Results will be presented in a Component Screening Report. Although many of the components may have benefits that extend beyond the bridge influence area, for this component screening, measures will focus on changes within the bridge influence area.

3 Assemble Alternative Packages

Project staff will assemble a representative set of alternative packages spanning the bridge influence area from the components that pass the first screening. Alternative packages will include components from each transportation category that blend together in a logical manner considering, for example, alignment and operational requirements. In some instances, one alternative package may sufficiently represent several other possible component combinations for analysis purposes. Assembling alternative packages allows project staff to model and analyze the integrated transportation system performance of I-5 within the bridge influence area, as well as other impacts and benefits, that cannot be assessed at the component level. Agreement on the range of alternatives to be considered is a major decision point in the project development process.

4 Narrow Range of Alternatives

Further screening will reduce the set of alternative packages to a reasonable range of Build Alternatives for comparison with the No-Build Alternative in the Draft Environmental Impact Statement (EIS). Performance measures will be modified to take advantage of new data available at this point in the project. Project staff will rate the performance of each alternative against these measures and will summarize results in an Alternatives Analysis Report. The most effective packages will advance into the Draft EIS either "as is" or after being modified based on screening results. Agreement on the alternatives to be evaluated in the Draft EIS is a major decision point in the project development process.

5 Select a Locally Preferred Alternative

Following preparation of the Draft EIS, project staff will again compare alternatives against the evaluation criteria using more detailed data compiled during preparation of the Draft EIS. This evaluation will be presented in a report to support selection of a preferred alternative. Agreement on the preferred alternative is a major decision point in the project development process.

6 Secure Federal Approval

The project team will document the locally preferred alternative in the Final EIS and submit it to the Federal Highway Administration and the Federal Transit Administration for approval. If all requirements have been met, these agencies will issue a Record of Decision to document final selection of the alternative to be built.

Step A: Pass/Fail Transportation Component Screening

Component:_____ Screening Questions Does the component achieve the following?	Roadway North/ Freight/ Bicycle/ Pedestrian	River Crossing/ Freight/ Bicycle/ Pedestrian	Roadway South/ Freight/ Bicycle/ Pedestrian	Transit	TSM/ TDM	Pass	Fail	Not Applicable	Unknown	Reason(s) to Drop
Increase vehicular capacity or decrease vehicular demand within the bridge influence area? For example, will the component provide additional travel lanes, remove a constraining bottleneck, or provide other modes of travel that can reduce the demand to travel by vehicle in the I-5 bridge influence area?	♦	♦	♦	♦	♦					
Improve transit performance within the bridge influence area? For example, will the component provide an exclusive high-capacity transitway, transit preferential lanes or other bus-specific improvements enough to improve transit capacity and performance in the bridge influence area?				♦	♦					
Improve freight mobility within the bridge influence area? For example, will the component provide truck freight priority or increase vehicular capacity or reduce vehicular demand enough to improve truck-hauled freight movements and reduce truck congestion in the bridge influence area? Will it improve or maintain access to existing freight facilities?	♦	♦	♦		♦					
Improve safety and decrease vulnerability to incidents within the bridge influence area? For example, will the component eliminate or minimize features that may be attributable to incidents within the bridge influence area such as a key bottleneck, closely spaced on and off ramps, or narrow shoulders?	♦	♦	♦	♦	♦					
Improve bicycle and pedestrian mobility within the bridge influence area? For example, will the component provide a continuous, connected and functional bicycle and pedestrian facility across the Columbia River?	♦	♦	♦							
Reduce seismic risk of the I-5 Columbia River crossing? For example, will the component seismically retrofit the existing Columbia River crossing and/or provide a new crossing that meets seismic standards?		♦								

Notes:

- Components will be screened only against the questions relevant to their categories (indicated by)
- Components that fail the relevant questions will be screened out, and the only way components will be prevented from proceeding to Step B component screening is if they receive a "fail" rating.
- Bicycle, pedestrian, and freight components will be evaluated with the roadway and river crossing categories given their inter-relationship.
- All components will be compared to the No Build, which includes transportation improvements adopted in the regional transportation plans but no improvements at the Columbia River crossing.

Step B: Component Screening

Criteria	Component Screening Performance Measures
1 Community Livability and Human Resources	
1.1 Avoid, then minimize adverse impacts to, and where practicable reduce, noise levels	1.1 Magnitude (on a qualitative scale) of residential properties within approximate noise impact contour
1.2 Avoid, then minimize adverse impacts to, and where practicable enhance, neighborhood cohesion	*1.2 Criteria 1.2 to be assessed during alternative package screening*
1.3 Avoid, then minimize adverse impacts to, and where practicable enhance, air quality	*1.3 Criteria 1.3 to be assessed during alternative package screening*
1.4 Avoid or minimize residential displacements	1.4 Magnitude (on a qualitative scale) of residential properties crossed by component's conceptual footprint
1.5 Avoid or minimize business displacements	1.5 Magnitude (on a qualitative scale) of commercial/industrial properties crossed by component's conceptual footprint
1.6 Avoid or minimize adverse impacts to, and where practicable, preserve historic, prehistoric, and cultural resources	1.6 Magnitude and significance (on a qualitative scale) of historic, prehistoric, and cultural resources crossed by component's conceptual footprint
1.7 Avoid, then minimize adverse impacts to, and where practicable enhance, public park and recreation resources	1.7 Magnitude and significance (on a qualitative scale) of public park and recreation resources crossed by component's conceptual footprint
1.8 Support local comprehensive plans and jurisdiction-approved neighborhood plans including development and redevelopment opportunities, consistent with these plans	*1.8 Criteria 1.8 to be assessed during alternative package screening*
1.9 Incorporate aesthetic values of the community in the project design	*1.9 Criteria 1.9 to be assessed during alternative package screening and/or alternative evaluation*
2 Mobility, Reliability, Accessibility, Congestion Reduction, and Efficiency	
2.1 Reduce travel times and delay in the I-5 corridor and within the bridge influence area for passenger vehicles	2.1 Potential (on a qualitative scale) for component to improve peak period passenger vehicle travel times and delay in the I-5 corridor and within the bridge influence area
2.2 Reduce travel times and delay in the I-5 corridor and within the bridge influence area for transit modes	2.2 Potential (on a qualitative scale) for component to reduce peak period travel time and delay for transit vehicles in the I-5 corridor and within the bridge influence area
2.3 Reduce the number of hours of daily highway congestion in the I-5 corridor and within the bridge influence area	2.3 Potential (on a qualitative scale) for component to reduce the number of hours of daily highway congestion in the I-5 corridor and within the bridge influence area
2.4 Enhance or maintain accessibility of jobs, housing, health care and education to travel markets served by the I-5 Columbia River crossing	2.4 *Criteria 2.4 to be assessed during alternative package screening and/or alternative evaluation*
2.5 Improve person throughput of I-5 Columbia River crossing	2.5 Potential (on a qualitative scale) for component to increase the level of persons crossing Columbia River via I-5 by mode
2.6 Improve vehicle throughput of I-5 Columbia River crossing	2.6 Potential (on a qualitative scale) for component to increase the level of vehicles by mode crossing Columbia River via I-5
3 Modal Choice	
3.1 Provide for multi-modal transportation choices in the I-5 corridor and within the bridge influence area	3.1 Potential (on a qualitative scale) for increasing transit capacity as a percentage of total daily capacity and peak period capacity across the I-5 Columbia River bridge
3.2 Improve transit service to target markets in the I-5 corridor and within the bridge influence area	3.2 Potential (on a qualitative scale) to improve transit service in the I-5 corridor to identified travel markets considering frequency, connectivity, span of hours, number of transfers, and travel time
3.3 Improve bike/pedestrian connectivity in the I-5 corridor and within the bridge influence area	3.3 Ability (on a qualitative scale) to improve connectivity of bicycle and pedestrian trips in the I-5 corridor and through the bridge influence area
3.4 Increase vehicle occupancy in the I-5 corridor and within the bridge influence area	3.4 Potential (on a qualitative scale) for component to increase vehicle occupancy in the I-5 corridor and within the bridge influence area
4 Safety	
4.1 Enhance vehicle/freight safety	4.1 Potential (on a qualitative scale) for component to improve vehicle/freight safety within the bridge influence area
4.2 Enhance bike/pedestrian facilities and safety	4.2 Quality (on a qualitative scale) of bicycle and pedestrian pathways provided within a component, considering design standards such as ADA compliance
4.3 Enhance or maintain marine safety	4.3 Quality (on a qualitative scale) of navigation channel geometrics to accommodate ship movements considering necessary tug and barge turning maneuvers and hazards of additional lift restrictions
4.4 Enhance or maintain aviation safety	4.4 Ability (on a qualitative scale) to accommodate FAA clearance zone for Pearson Airpark
4.5 Provide sustained life-line connectivity	4.5 Ability (on a qualitative scale) to accommodate life-line connections in the I-5 corridor across the Columbia River to be maintained in an earthquake
4.6 Enhance I-5 incident/emergency response access within the bridge influence area	4.6 Quality (on a qualitative scale) to accommodate incident/emergency service access to incidents on I-5 in the bridge influence area
5 Regional Economy; Freight Mobility	
5.1 Reduce travel times and reduce delay for vehicle-moved freight on I-5 *within* the bridge influence area	5.1 Potential (on a qualitative scale) for component to reduce daily delay for trucks on I-5 within the bridge influence area
5.2 Reduce travel times and reduce delay for vehicle-moved freight in the I-5 corridor	5.2 Potential (on a qualitative scale) for component to reduce daily delay for trucks in the I-5 corridor
5.3 Enhance or maintain efficiency of marine navigation	5.3 Potential (on a qualitative scale) for component to avert extension of "no bridge lift" periods tied to I-5 congestion
5.4 Improve freight truck throughput of the bridge influence area	5.4 Potential (on a qualitative scale) for component to increase freight vehicle throughput across the Columbia River via I-5
5.5 Avoid or minimize adverse impacts to the parallel freight rail corridor	*5.5 Criteria 5.5 to be assessed during alternative package screening and/or alternative evaluation*
5.6 Enhance or maintain access to port, freight, and industrial facilities	5.6 Range of travel times (on a qualitative scale) between up to five origin/destination pairs of typical freight centers within the bridge influence area (e.g., between Port of Vancouver and Columbia Blvd. interchange)
6 Stewardship of Natural Resources	
6.1 Avoid, then minimize adverse impacts to, and where practicable enhance, threatened or endangered fish and wildlife and their habitat	6.1 Magnitude (on a qualitative scale) of direct impact on designated critical habitat and other threatened or endangered species habitat
6.2 Avoid, then minimize adverse impacts to, and where practicable enhance, other fish and wildlife and their habitat	6.2 Magnitude (on a qualitative scale) of direct impact on other fish and wildlife habitat
6.3 Avoid, then minimize adverse impacts to, and where practicable enhance, rare, threatened, or endangered plant species	6.3 Magnitude (on a qualitative scale) of direct impact on rare, threatened, or endangered plant species
6.4 Avoid, then minimize adverse impacts to, and where practicable enhance and/or restore, wetlands	6.4 Magnitude and significance (on a qualitative scale) of direct impact on wetlands
6.5 Avoid, then minimize adverse impacts to, and where practicable enhance, water quality	6.5 Magnitude (on a qualitative scale) of net increase in impervious surface area
6.6 Minimize total energy consumption of construction and transportation system operations	*6.6 Criteria 6.6 to be assessed during alternative evaluation*
6.7 Avoid, then minimize adverse impacts to, and where practicable enhance, waterways	6.7 Magnitude and significance (on a qualitative scale) of direct impact on waterways
7 Distribution of Benefits and Impacts	
7.1 Avoid or minimize disproportionate adverse impacts on, and where practicable, improve conditions for low income and minority populations	7.1 Magnitude (on a qualitative scale) of potential residential property acquisitions in blocks or block groups with high share of low income or minority populations (compare to impacts in other blocks or block groups)
7.2 Provide for equitable distribution of benefits to low income and minority populations	7.2 Potential improvements (on a qualitative scale) to vehicle and transit travel times between representative low income or minority areas and selected destinations (including employment, education and commercial areas)
8 Cost Effectiveness and Financial Resources	
8.1 Minimize the cost of construction\	*8.1 Criteria 8.1 to be assessed during alternative package screening and/or alternative evaluation*
8.2 Ensure transportation system construction cost effectiveness	*8.2 Criteria 8.2 to be assessed during alternative package screening and/or alternative evaluation*
8.3 Ensure transportation system maintenance and operation cost effectiveness	*8.3 Criteria 8.3 to be assessed during alternative package screening and/or alternative evaluation*
8.4 Ensure a reliable funding plan for the project	*8.4 Criteria 8.4 to be assessed during alternative package screening and/or alternative evaluation*
9 Growth Management/Land Use	
9.1 Support adopted regional growth management and comprehensive plans	*9.1 Criteria 9.1 to be assessed during alternative package screening and/or alternative evaluation*
10 Constructability	
10.1 Maintain transportation operations during construction	*10.1 Criteria 10.1 to be assessed during alternative package screening and/or alternative evaluation*
10.2 Minimize adverse construction impacts	*10.2 Criteria 10.2 to be assessed during alternative package screening and/or alternative evaluation*
10.3 Provide flexibility to accommodate future transportation system improvements	*10.3 Criteria 10.3 to be assessed during alternative package screening and/or alternative evaluation*
10.4 Use construction practices and materials that minimize environmental impact	*10.4 Criteria 10.4 to be assessed during alternative package screening and/or alternative evaluation*

Notes: 1. Bicycle, pedestrian and freight components will be evaluated with the roadway and river crossing categories given their interrelationship. 2. These criteria will be used in alternative screening and the selection of a preferred alternative, but the performance measures will change.
3. Where noted, insufficient data will exist to report on certain criteria during component screening. Data will be available during subsequent analysis of alternative packages.

Columbia River CROSSING

Attachment E

Step A Component Fact Sheets

Columbia River CROSSING

DRAFT STEP A COMPONENT FACT SHEETS

April 19, 2006

DRAFT COMPONENTS STEP A SCREENING REPORT

April 19, 2006

Columbia River CROSSING

TABLE OF CONTENTS

List of Figures

Transit Fact Sheets

River Crossing Fact Sheets

List of Tables

ACRONYMS

AA	Alternatives Analysis
ADA	Americans with Disabilities Act
AGT	Automated Guideway Transit
BNSF	Burlington Northern Santa Fe Railroad
BRT	Bus Rapid Transit
CRC	Columbia River Crossing
CRD	Columbia River Datum
DEIS	Draft Environmental Impact Statement
EIS	Environmental Impact Statement
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HOV	High Occupancy Vehicle
I-5	Interstate 5
LRT	Light Rail Transit
NEPA	National Environmental Policy Act
ODOT	Oregon Department of Transportation
PDX	Portland International Airport
PRT	Personal Rapid Transit
RTC	Regional Transportation Council
RC	River Crossing
SOV	Single Occupant Vehicle
TR	Transit
TSM/TDM	Traffic System Management/Traffic Demand Management
WSDOT	Washington State Department of Transportation

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1. What's Inside

On March 22, 2006, the project team presented a *Components Step A Screening Report* to members of the I-5 CRC Task Force. The report described how a broad range of potential transportation improvements (also known as "components") was initially evaluated and screened, and presented the results of that screening.

This companion *Component Step A Fact Sheets* provides fact sheets for each of the 14 Transit and 23 River Crossing components taken through Step A screening. It was prepared to address questions posed by the Task Force and to more fully document the rationale underlying staff's recommendations to advance or drop from further consideration certain Transit and River Crossing components.

As described in more detail below, the Step A screening process applies the six "pass/fail" questions derived from the project's *Problem Definition* as adopted by the Task Force in November 2005. A "fail" response to any of the relevant questions represents a "fatal flaw" that is inconsistent with the project Purpose and Need. Staff recommended dropping from further consideration all components receiving one or more "fail" responses. Only those components free of any "fail" responses were recommended for further consideration.

The fact sheets present the "pass/fail" responses and supporting information for each of the Transit and River Crossing components.

1.1 Step A Screening Overview

In February 2006, the CRC Task Force adopted a six-step evaluation framework that defines the process for screening the large number of transportation components and subsequently, a limited set of multi-modal alternative packages. In general, the framework establishes screening criteria and performance measures to evaluate the effectiveness of the transportation components in addressing:

- The project Purpose and Need,
- Problems identified in the project's Problem Definition, and
- Values identified in the Task Force's Vision and Values Statement.

Component screening is the first stage in the complete evaluation framework and is itself a two-step process.

In Step A, transportation components were screened against up to six pass/fail questions *derived directly from the Problem Definition*. To determine if each component offers an improvement, they were compared to the No Build condition, which includes 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. Components in the Pedestrian, Bike, Freight, Roadways, and TSM/TDM categories were not evaluated because their performance would critically depend upon how they were integrated with promising transit and/or river crossing improvements. As mentioned earlier, components in these categories (e.g., Ramp Queue Jump Lanes) could be implemented in a wide variety of ways. These components will be paired with complementary transit and river crossing components during alternatives packaging. Table 1-1 shows the six Step A questions and what questions pertain to the transit and river crossing components.

Table 1-1. Component Categories and Relevant Step A Questions

Question: Does the Component	Transit Components	River Crossing Components
1. Increase vehicular capacity or decrease vehicular demand within the bridge influence area?	♦	♦
2. Improve transit performance within the bridge influence area?	♦	♦
3. Improve freight mobility within the bridge influence area?		♦
4. Improve safety and decrease vulnerability to incidents within the bridge influence area?	♦	♦
5. Improve bicycle and pedestrian mobility within the bridge influence area?		♦
6. Reduce seismic risk of the I-5 Columbia River crossing?		♦

Note: Components were only screened against questions indicated by ♦

2. Transit Component Fact Sheets

In summary, six transit components are recommended to pass through Step A component screening and advance for further consideration and screening, while eight components are recommended to be dropped from further consideration via Step A screening.

This section presents fact sheets for each of the 14 transit components (TR-1 through TR-14) taken through Step A screening. Each fact sheet provides reasoning behind staff's responses to the six "pass/fail" questions and ultimately the recommendation to either advance the component or drop it from further consideration for this project. Table 2-1 summarizes the transit component responses.

Table 2-1. Transit Components Step A Results

COMPONENTS		COMPONENT SCREENING RESULTS						
ID	NAME	Q.1	Q.2	Q.3	Q.4	Q.5	Q.6	Overall
TR-1	Express Bus in General Purpose (GP) lanes	P	P	NA	U	NA	NA	P
TR-2	Express Bus in Managed Lanes	P	P	NA	U	NA	NA	P
TR-3	Bus Rapid Transit (BRT)-Lite	P	P	NA	U	NA	NA	P
TR-4	Bus Rapid Transit (BRT)- Full	P	P	NA	U	NA	NA	P
TR-5	Light Rail Transit (LRT)	P	P	NA	U	NA	NA	P
TR-6	Streetcar	P	P	NA	U	NA	NA	P
TR-7	High Speed Rail	F	F	NA	U	NA	NA	F
TR-8	Ferry Service	F	F	NA	U	NA	NA	F
TR-9	Monorail System	P	F	NA	U	NA	NA	F
TR-10	Magnetic Levitation Railway	F	F	NA	U	NA	NA	F
TR-11	Commuter Rail in BNSF Trackage	P	F	NA	U	NA	NA	F
TR-12	Heavy Rail	P	F	NA	U	NA	NA	F
TR-13	Personal Rapid Transit	F	F	NA	U	NA	NA	F
TR-14	People Mover/Automated Guideway Transit (AGT)	P	F	NA	U	NA	NA	F

P = Pass F = Fail NA = Not Applicable U = Unknown

Each transit component was screened against two of the six questions in Step A. These questions are, does the component:

Q1. Increase vehicular capacity or decrease vehicular demand within the Bridge Influence Area?, and

Q2. Improve transit performance within the Bridge Influence Area?

The transit components were also expected to be screened against Question #4, which is, does the component:

Q4. Improve safety and decrease vulnerability to incidents within the Bridge Influence Area?

To satisfy Question #4, a transit component would need to attract ridership sufficient to improve general traffic conditions for all vehicles (see Section 3.4.10). Answering this question, however, depends on knowing *with a fair degree of accuracy* how much future traffic volumes would be reduced by the transit component, and if the transit component would be complemented by new river crossing highway capacity. As promising components have not yet been combined, and detailed traffic modeling has not been completed, it is not yet possible to answer this question for the transit components. Therefore, all of the transit components received a rating of "unknown" for Question #4. In comparison, Question #1, asks *more generally* if a component is likely to reduce vehicle demand, and thus is possible to answer.

TR-1: Express Bus in General Purpose Lanes

Staff Recommendation: Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Pass	Could increase vehicular capacity to serve transit and reduce auto demand within the Bridge Influence Area.
Q2. Transit	Pass	Could increase the speed of transit in the Bridge Influence Area, provided enough new general purpose capacity is added to reduce congestion levels. Transit reliability could also be improved if congestion were sufficiently reduced.
Q3. Freight	NA	
Q4. Safety	U	
Q5. Bike/Ped	NA	
Q6. Seismic	NA	

P = Pass F = Fail NA = Not Applicable U = Unknown

TR-2: Express Bus in Managed Lanes

Staff Recommendation: Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Pass	Could decrease vehicular demand through shift to transit within the Bridge Influence Area by giving preference and a speed advantage to transit.
Q2. Transit	Pass	Could improve transit performance by managing congestion and reducing the potential for collisions, thereby improving transit reliability.
Q3. Freight	NA	
Q4. Safety	U	
Q5. Bike/Ped	NA	
Q6. Seismic	NA	

P = Pass F = Fail NA = Not Applicable U = Unknown

TR-3: Bus Rapid Transit (BRT)- Lite

Staff Recommendation: Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Pass	Could decrease vehicular demand through shift to transit within the Bridge Influence Area by substantially increasing transit capacity and providing a travel preference and speed advantage to transit.
Q2. Transit	Pass	Could improve transit performance by managing congestion and thereby improving transit reliability.
Q3. Freight	NA	
Q4. Safety	U	
Q5. Bike/Ped	NA	
Q6. Seismic	NA	

P = Pass F = Fail NA = Not Applicable U = Unknown

TR-4: Bus Rapid Transit (BRT) - Full

Staff Recommendation: Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Pass	Could decrease vehicular demand through shift to transit within the Bridge Influence Area by substantially increasing transit capacity and providing a dedicated transit lane that would relieve congestion and improve reliability for transit.
Q2. Transit	Pass	Could improve transit reliability and travel speed by completely separating bus rapid transit vehicles from other traffic and giving them a substantial travel time savings.
Q3. Freight	NA	
Q4. Safety	U	
Q5. Bike/Ped	NA	
Q6. Seismic	NA	

P = Pass F = Fail NA = Not Applicable U = Unknown

TR-5: Light Rail Transit (LRT)

Staff Recommendation: Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Pass	Could decrease vehicular demand through shift to transit within the Bridge Influence Area by substantially increasing transit capacity and providing an exclusive guideway that would not be used by automobiles. Its operating characteristics allow it to serve both short and long distance trips.
Q2. Transit	Pass	Could improve transit travel time and reliability by completely separating LRT trains from automobile traffic.
Q3. Freight	NA	
Q4. Safety	U	
Q5. Bike/Ped	NA	
Q6. Seismic	NA	

P = Pass F = Fail NA = Not Applicable U = Unknown

TR-6: Streetcar

Staff Recommendation: Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Pass	Could decrease vehicular demand through shift to transit within the Bridge Influence Area by increasing transit capacity and providing an exclusive guideway that would not be used by automobiles.
Q2. Transit	Pass	Could improve transit travel time and reliability by completely separating streetcars from automobile traffic. This critically assumes that it is possible to interline streetcar and LRT- meaning they each use the same guideway (tracks) such as the Interstate MAX corridor. While a determination on this issue has not yet been made, the idea includes significant challenges affecting its viability.
Q3. Freight	NA	
Q4. Safety	U	
Q5. Bike/Ped	NA	
Q6. Seismic	NA	

P = Pass F = Fail NA = Not Applicable U = Unknown

TRANSIT

TR-7: High Speed Rail

Staff Recommendation: Not Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Fail	Operating speeds of 175+ mph are most compatible with long distance inter-city and inter-state service with at most one transit station in the greater Portland/Vancouver metropolitan area. This one transit station would only serve transit trips arriving from or destined to locations outside the region, and thus would not attract the ridership necessary to notably reduce vehicular demand within the I-5 Bridge Influence Area.
Q2. Transit	Fail	It is not feasible to integrate this transit mode with the existing regional transit system while both 1) taking advantage of the operational features of high speed rail, and 2) providing service to identified transit markets within the I-5 Bridge Influence Area. Thus, it would not appreciably improve transit performance within the I-5 Bridge Influence Area.
Q3. Freight	NA	
Q4. Safety	U	
Q5. Bike/Ped	NA	
Q6. Seismic	NA	

P = Pass F = Fail NA = Not Applicable U = Unknown

TR-8: Ferry Service

Staff Recommendation: Not Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Fail	Lacks the capacity and operational characteristics to generate significant ridership needed to appreciably reduce vehicular demand within the Bridge Influence Area. Provides for long, out of direction travel times with limited access to I-5 travel markets.
Q2. Transit	Fail	Ferry service is most appropriate for longer distance travel with no intermediate stops. Service to I-5 travel markets would require more stops than could be achieved with ferry service. The travel time for a ferry service connecting downtown Vancouver to downtown Portland, for example, would likely be slower than the slowest land-based transit bus, even in the congested I-5 corridor, since the service would have to travel many miles out of direction to access the Willamette River. The service would have little or no connectivity to smaller markets and connecting transit services, and likely would not even serve intermediate but significant transit markets such as North Portland. Due to slow travel times and few docking stations, the service would carry relatively few passengers. Users would incur a time delay associated with embarking and debarking a ferry that makes ferry service less attractive. Significant issues would exist with siting ferry terminals.
Q3. Freight	NA	
Q4. Safety	U	
Q5. Bike/Ped	NA	
Q6. Seismic	NA	

P = Pass F = Fail NA = Not Applicable U = Unknown

TR-9: Monorail System

Staff Recommendation: Not Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Pass	Could decrease vehicular demand through shift to transit within the Bridge Influence Area by increasing transit capacity and providing an exclusive guideway that would not be used by automobiles.
Q2. Transit	Fail	A monorail service could conceivably be designed to serve multiple destinations within the Bridge Influence Area and I-5 corridor, since the technology is not uniquely suited to long-distance or short-distance travel. In order to improve existing transit service in the Bridge Influence Area, however, it would have to be integrated with the existing bus and rail network, which is infeasible; the technology would require a completely grade separated right-of-way. For these reasons, monorail is not an appropriate public transportation component for the Bridge Influence Area.
Q3. Freight	NA	
Q4. Safety	U	
Q5. Bike/Ped	NA	
Q6. Seismic	NA	

P = Pass F = Fail NA = Not Applicable U = Unknown

TR-10: Magnetic Levitation (MagLev) Railway

Staff Recommendation: Not Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Fail	Similar to high speed rail (TR-7), the high travel speeds (175+ mph) and acceleration characteristics associated with Maglev railways are most compatible with long distance inter-city and inter-state service with at most one transit station in the greater Portland/Vancouver metropolitan area. This one transit station would only serve transit trips arriving from or destined to locations outside the region, and thus would not attract the ridership necessary to notably reduce vehicular demand within the I-5 Bridge Influence Area.
Q2. Transit	Fail	It is not feasible to integrate this transit mode with the existing regional transit system while both, 1) taking advantage of the operational features of Maglev rail, and 2) providing service to identified transit markets within the I-5 Bridge Influence Area. Thus, it would not appreciably improve transit performance within the I-5 Bridge Influence Area.
Q3. Freight	NA	
Q4. Safety	U	
Q5. Bike/Ped	NA	
Q6. Seismic	NA	

P = Pass F = Fail NA = Not Applicable U = Unknown

TR-11: Commuter Rail Transit

Staff Recommendation: Not Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Pass	Could decrease vehicular demand within the Bridge Influence Area through a shift to transit.
Q2. Transit	Fail	To improve existing transit service in the Bridge Influence Area, it would have to be integrated with the existing bus and rail network, which is infeasible, as the technology would operate in a completely grade separated right-of-way. Additionally, the existing railroad right-of-way misses some key I-5 transit markets. In addition, during the I-5 Partnership Study, an in-depth study of commuter rail options determined that due to projected congestion in the existing freight rail system in the next 20 years, commuter rail could only be implemented on a separate passenger rail-only network; it could not be implemented on existing regional freight rail trackage.
Q3. Freight	NA	
Q4. Safety	U	
Q5. Bike/Ped	NA	
Q6. Seismic	NA	

P = Pass F = Fail NA = Not Applicable U = Unknown

TR-12: Heavy Rail Transit

Staff Recommendation: Not Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Pass	Could decrease vehicular demand within the Bridge Influence Area through a shift to transit.
Q2. Transit	Fail	To improve existing transit service in the Bridge Influence Area, it would have to be integrated with the existing bus and rail network, which is infeasible, as the technology would operate in a completely grade separated right-of-way. The Portland-Vancouver region is not projected to realize the population and density levels by 2030 on a par with the world's largest and most congested cities: New York, Washington D.C., London, Tokyo, etc. that can generate the necessary passenger demands that make an investment in heavy rail viable.
Q3. Freight	NA	
Q4. Safety	U	
Q5. Bike/Ped	NA	
Q6. Seismic	NA	

P = Pass F = Fail NA = Not Applicable U = Unknown

TR-13: Personal Rapid Transit (PRT)

Staff Recommendation: Not Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Fail	PRT's conceptual advantage critically depends on building a comprehensive regional system that serves virtually every place that patrons want to go. PRT within the Bridge Influence Area would not attract significant demand because it simply would not go to many of the final I-5 corridor and regional destinations that patrons want to go. How a PRT system would "grow" from a river crossing to a local, or even a regional network, is unclear. It's inconceivable that a PRT system within the Bridge Influence Area could attract the ridership necessary to appreciably reduce vehicular demand.
Q2. Transit	Fail	Capacity is one of the primary limitations of PRT, and incompatibility with the existing regional transit systems. Unless a very large number of vehicles were used, the system would not have enough capacity to serve the large trip demands in the Bridge Influence Area and to significant destinations like downtown Portland. Using such a large number of vehicles, however, would be impractical and inefficient.
Q3. Freight	NA	
Q4. Safety	U	
Q5. Bike/Ped	NA	
Q6. Seismic	NA	

P = Pass F = Fail NA = Not Applicable U = Unknown

Note: A variation of this component referred to as "SkyTran" was introduced at the 3-22-06 Task Force meeting. Staff believes the "SkyTran" idea is substantially similar to TR-13 and would fail Step A screening questions 1 and 2 for similar reasons as cited above.

TR-14: People Mover/Automated Guideway Transit

Staff Recommendation: Not Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Pass	Could decrease vehicular demand within the Bridge Influence Area through a shift to transit.
Q2. Transit	Fail	To improve existing transit service in the Bridge Influence Area, it would have to be integrated with the existing bus and rail network, which is infeasible, as the technology would operate in a completely grade separated right-of-way. AGT is a proven technology suitable for short-distance trips, and its limited application in North America has been to provide local circulator service (e.g. at airports). LRT and AGT share some of the same capacity and operating characteristics, but unlike LRT, AGT requires a completely grade separated right-of-way and either underground or aerial stations. For these reasons, AGT lines are not an appropriate public transportation component for the Bridge Influence Area.
Q3. Freight	NA	
Q4. Safety	U	
Q5. Bike/Ped	NA	
Q6. Seismic	NA	

P = Pass F = Fail NA = Not Applicable U = Unknown

3. River Crossing Component Fact Sheets

In summary, nine (9) river crossing components are recommended to pass through Step A component screening and advance for further consideration and screening, while 14 components are recommended to be dropped from further consideration via Step A screening.

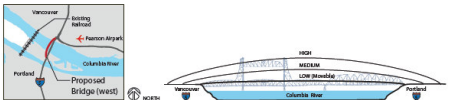
This section presents fact sheets for each of the 23 river crossing components (RC-1 through RC-23) taken through Step A screening. Fact sheets provide rationale for staff's responses to the six "pass/fail" questions and ultimately the recommendation to either advance the component or drop it from further consideration for this project. Table 3-1 summarizes the river crossing results. **Note-** Where components perform similarly across the six questions, they are grouped for reporting (e.g., RC 1-4, RC 5/6, RC 7-9).

Table 3-1. River Crossing Components Step A results

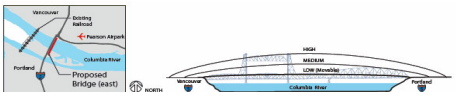
COMPONENTS		COMPONENT SCREENING RESULTS						
ID	NAME	Q.1	Q.2	Q.3	Q.4	Q.5	Q.6	Overall
RC-1	Replacement Bridge-Downstream/Low-level/Movable	P	P	P	P	P	P	P
RC-2	Replacement Bridge-Upstream/Low-level/Movable	P	P	P	P	P	P	P
RC-3	Replacement Bridge-Downstream/Mid-level	P	P	P	P	P	P	P
RC-4	Replacement Bridge-Upstream/Mid-level	P	P	P	P	P	P	P
RC-5	Replacement Bridge-Downstream/High-level	P	P	P	F	P	P	F
RC-6	Replacement Bridge-Upstream/High-level	P	P	P	F	P	P	F
RC-7	Supplemental Bridge-Downstream/Low-level/Movable	P	P	P	U	P	U	P
RC-8	Supplemental Bridge-Upstream/Low-level/Movable	P	P	P	U	P	U	P
RC-9	Supplemental Bridge-Downstream/Mid-level	P	P	P	U	P	U	P
RC-10	Supplemental Bridge-Upstream/Mid-level	P	P	P	F	P	U	F
RC-11	Supplemental Bridge-Downstream/High-level	P	P	P	F	P	U	F
RC-12	Supplemental Bridge-Upstream/High-level	P	P	P	F	P	U	F
RC-13	Tunnel to supplement I-5	P	P	P	P	P	U	P
RC-14	New Corridor Crossing	Note1	F	P	F	F	F	F
RC-15	New Corridor Crossing plus Widen Existing I-5 Bridges	Note1	F	P	F	F	F	F
RC-16	New Western Highway (I-605)	Note1	F	F	F	F	F	F
RC-17	New Eastern Columbia River Crossing	F	F	F	F	F	F	F
RC-18	I-205 Improvements	F	F	F	F	F	F	F
RC-19	Arterial Crossing without I-5 Improvements	Note1	P	U	F	P	F	F
RC-20	Replacement Tunnel	F	F	F	P	F	P	F
RC-21	33rd Avenue Crossing	F	F	F	F	F	F	F
RC-22	Non-Freeway Multi-Modal Columbia River Crossing	Note1	P	U	F	P	F	F
RC-23	Arterial Crossing with I-5 Improvements	Note1	P	U	P	P	U	P

[1] May provide some potential benefit in congestion management relative to 2030 No Build conditions.
P = Pass F = Fail NA = Not Applicable U = Unknown New since 3-22-06 TF mtg

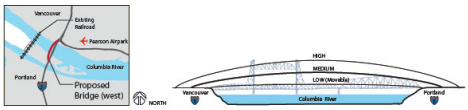
RC-1: Replacement Bridge Downstream/ Low Level/Moveable



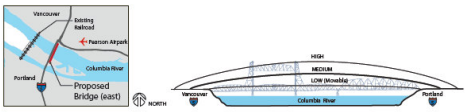
RC-2: Replacement Bridge Upstream/ Low Level/Moveable



RC-3: Replacement Bridge Downstream/Mid-level



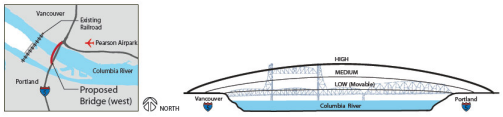
RC-4: Replacement Bridge Upstream/Mid-level



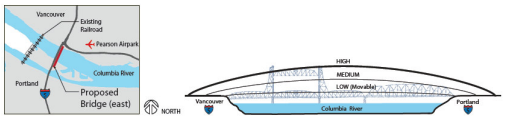
Staff Recommendation: Advance RC-1 through RC-4

Step A Question	Pass/ Fail	Reasons: *RC-1 through RC-4 each:*
Q1. Traffic	Pass	Increases vehicular capacity along I-5 in the Bridge Influence Area by adding new travel lanes. Serves projected year 2020 traffic levels, which is expected to increase by at least 40% (over 50,000 daily vehicles) over 2005 levels, at similar or fewer hours of congestion compared to 2005 conditions (i.e., 4 hours during the afternoon/evening peak along I-5 within the Bridge Influence Area).
Q2. Transit	Pass	Provides increased travel capacity to accommodate transit within the I-5 Bridge Influence Area serving the identified travel markets.
Q3. Freight	Pass	Provides increased travel capacity for truck-hauled freight along I-5. Would be compatible with improvements to interchanges within the Bridge Influence Area that would support improved truck operations.
Q4. Safety	Pass	Provides I-5 crossing that addresses many non-standard design features and would be compatible with substantially upgrading I-5 within the Bridge Influence Area to current standards. Would not encroach into Pearson Airpark airspace and would satisfy U.S. Coast Guard navigational interests.
Q5. Bike/Ped	Pass	Provides new Columbia River crossing with modern bike/ped pathway(s).
Q6. Seismic	Pass	Provides new I-5 crossing built to current seismic standards.

RC-5: Replacement Bridge Downstream High Level



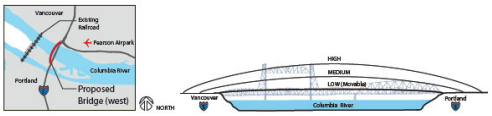
RC-6: Replacement Bridge Upstream High level



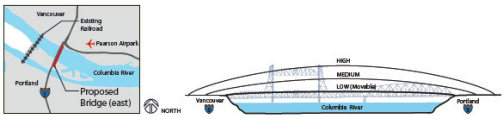
Staff Recommendation: Not Advance RC-5 and RC-6

Step A Question	Pass/ Fail	Reasons: *RC-5 and RC-6 each:*
Q1. Traffic	Pass	Increases vehicular capacity along I-5 in the Bridge Influence Area by adding new travel lanes. Serves projected year 2020 traffic levels, which is expected to increase by at least 40% (over 50,000 daily vehicles) over 2005 levels, at similar or fewer hours of congestion compared to 2005 conditions (i.e., 4 hours during the afternoon/evening peak along I-5 within the Bridge Influence Area).
Q2. Transit	Pass	Provides increased travel capacity to accommodate transit within the I-5 Bridge Influence Area serving the identified travel markets.
Q3. Freight	Pass	Provides increased travel capacity for truck-hauled freight along I-5. Would be compatible with improvements to interchanges within the Bridge Influence Area that would support improved truck operations.
Q4. Safety	Fail	Provides I-5 crossing that, while addressing many non-standard design features and substantially upgrading I-5 within the Bridge Influence Area to current standards, would be built at a height that unacceptably encroaches into Pearson Airpark airspace- presenting a critical safety flaw.
Q5. Bike/Ped	Pass	Provides new Columbia River crossing with modern bike/ped pathway(s).
Q6. Seismic	Pass	Provides new I-5 crossing built to current seismic standards.

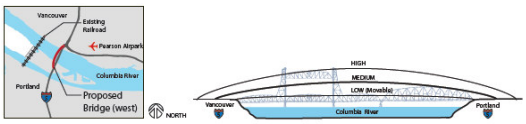
RC-7: Supplemental Bridge Downstream/Low Level/Moveable



RC-8: Supplemental Bridge Upstream Low Level/Moveable

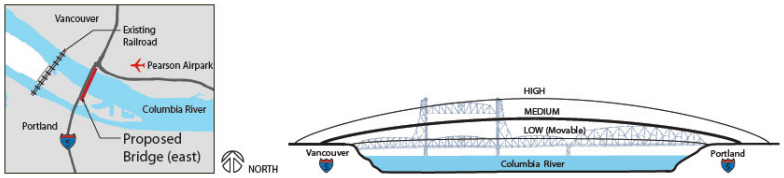


RC-9: Supplemental Bridge Downstream Mid-level



Staff Recommendation: Advance RC-7 through RC-9

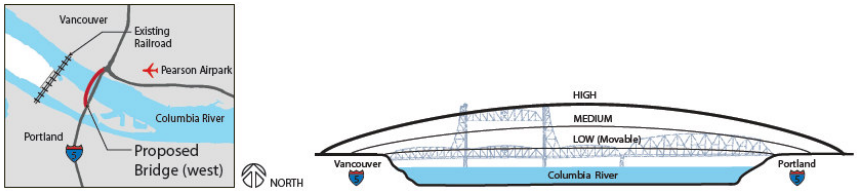
Step A Question	Pass/ Fail	Reasons: *RC-7 through RC-9 each:*
Q1. Traffic	Pass	Increases vehicular capacity along I-5 in the Bridge Influence Area by adding new travel lanes. Serves projected year 2020 traffic levels, which is expected to increase by at least 40% (over 50,000 daily vehicles) over 2005 levels, at similar or fewer hours of congestion compared to 2005 conditions (i.e., 4 hours during the afternoon/evening peak along I-5 within the Bridge Influence Area).
Q2. Transit	Pass	Provides increased travel capacity to accommodate transit within the I-5 Bridge Influence Area serving the identified travel markets.
Q3. Freight	Pass	Provides increased travel capacity for truck-hauled freight along I-5. Would be compatible with improvements to interchanges within the Bridge Influence Area that would support improved truck operations.
Q4. Safety	Unknown	Provides I-5 crossing that addresses many non-standard design features and would be compatible with substantially upgrading I-5 within the Bridge Influence Area to current standards. Would not encroach into Pearson Airpark airspace. Presents challenges to align piers of new and existing bridges to maintain, and make no worse, existing marine navigation.
Q5. Bike/Ped	Pass	Provides new Columbia River crossing with modern bike/ped pathway(s).
Q6. Seismic	Unknown	Provides new I-5 crossing built to current seismic standards. However, depending on the use of the existing I-5 bridges, they may need to be seismically upgraded to meet the new seismic criteria. It is not known at this point whether the existing bridges can be retrofitted to meet current seismic design standards.



RC-10: Supplemental Bridge Upstream/Mid-level

Staff Recommendation: Not Advance

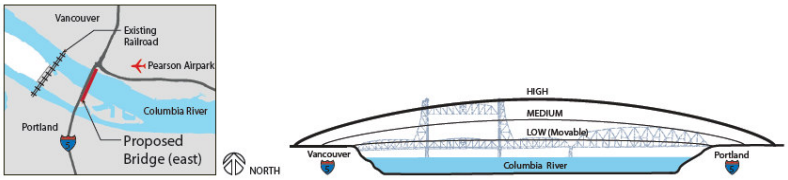
Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Pass	Increases vehicular capacity along I-5 in the Bridge Influence Area by adding new travel lanes. Serves projected year 2020 traffic levels, which is expected to increase by at least 40% (over 50,000 daily vehicles) over 2005 levels, at similar or fewer hours of congestion compared to 2005 conditions (i.e., 4 hours during the afternoon/evening peak along I-5 within the Bridge Influence Area).
Q2. Transit	Pass	Provides increased travel capacity to accommodate transit within the I-5 Bridge Influence Area serving the identified travel markets.
Q3. Freight	Pass	Provides increased travel capacity for truck-hauled freight along I-5. Would be compatible with improvements to interchanges within the Bridge Influence Area that would support improved truck operations.
Q4. Safety	Fail	Retains the existing I-5 bridges, and therefore the opening for the supplemental bridge would need to line up with the existing lift span opening. This places the high point of the new bridge on the north side of the Columbia River channel. In addition, the new bridge's upstream location places it closer to Pearson Airpark. Due to the upstream and high point locations for the new bridge, this crossing unacceptably encroaches into the Pearson Airpark airspace.
Q5. Bike/Ped	Pass	Provides new Columbia River crossing with modern bike/ped pathway(s).
Q6. Seismic	Unknown	Provides new I-5 crossing built to current seismic standards. However, depending on the use of the existing I-5 bridges, they may need to be seismically upgraded to meet the new seismic criteria. It is not known at this point whether the existing bridges can be retrofitted to meet current seismic design standards.



RC-11: Supplemental Bridge Downstream/High Level

Staff Recommendation: Not Advance

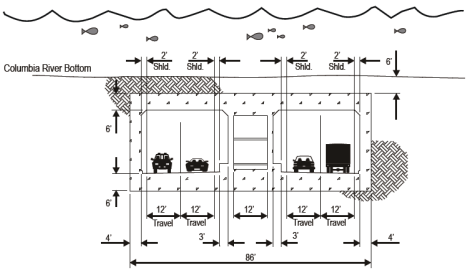
Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Pass	Increases vehicular capacity along I-5 in the Bridge Influence Area by adding new travel lanes. Serves projected year 2020 traffic levels, which is expected to increase by at least 40% (over 50,000 daily vehicles) over 2005 levels, at similar or fewer hours of congestion compared to 2005 conditions (i.e., 4 hours during the afternoon/evening peak along I-5 within the Bridge Influence Area).
Q2. Transit	Pass	Provides increased travel capacity to accommodate transit within the I-5 Bridge Influence Area serving the identified travel markets.
Q3. Freight	Pass	Provides increased travel capacity for truck-hauled freight along I-5. Would be compatible with improvements to interchanges within the Bridge Influence Area that would support improved truck operations.
Q4. Safety	Fail	Provides I-5 crossing that, while addressing many non-standard design features and substantially upgrading I-5 within the Bridge Influence Area to current standards, would be built at a height that unacceptably encroaches into Pearson Airpark airspace.
Q5. Bike/Ped	Pass	Provides new Columbia River crossing with modern bike/ped pathway(s).
Q6. Seismic	Unknown	Provides new I-5 crossing built to current seismic standards. However, depending on the use of the existing I-5 bridges, they may need to be seismically upgraded to meet the new seismic criteria. It is not known at this point whether the existing bridges can be retrofitted to meet current seismic design standards.



RC-12: Supplemental Bridge Upstream/High Level

Staff Recommendation: Not Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Pass	Increases vehicular capacity along I-5 in the Bridge Influence Area by adding new travel lanes. Serves projected year 2020 traffic levels, which is expected to increase by at least 40% (over 50,000 daily vehicles) over 2005 levels, at similar or fewer hours of congestion compared to 2005 conditions (i.e., 4 hours during the afternoon/evening peak along I-5 within the Bridge Influence Area).
Q2. Transit	Pass	Provides increased travel capacity to accommodate transit within the I-5 Bridge Influence Area serving the identified travel markets.
Q3. Freight	Pass	Provides increased travel capacity for truck-hauled freight along I-5. Would be compatible with improvements to interchanges within the Bridge Influence Area that would support improved truck operations.
Q4. Safety	Fail	Provides I-5 crossing that, while addressing many non-standard design features and substantially upgrading I-5 within the Bridge Influence Area to current standards, would be built at a height that unacceptably encroaches into Pearson Airpark airspace.
Q5. Bike/Ped	Pass	Provides new Columbia River crossing with modern bike/ped pathway(s).
Q6. Seismic	Unknown	Provides new I-5 crossing built to current seismic standards. However, depending on the use of the existing I-5 bridges, they may need to be seismically upgraded to meet the new seismic criteria. It is not known at this point whether the existing bridges can be retrofitted to meet current seismic design standards.



RC-13: Tunnel to Supplement I-5

Staff Recommendation: Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Pass	Increases vehicular capacity along I-5 in the Bridge Influence Area by adding new travel lanes. Serves an express function within the Bridge Influence Area with Vancouver access limited to the SR 500 interchange and points north and Portland access limited to Interstate Avenue and points south. Serves projected year 2020 traffic levels, expected to increase by at least 40% (by over 50,000 daily vehicles) over 2005 levels, at similar or fewer hours of congestion compared to 2005 conditions (i.e., 4 hours during the afternoon/evening peak along I-5 within the Bridge Influence Area).
Q2. Transit	Pass	Provides increased travel capacity to accommodate transit within the I-5 Bridge Influence Area serving the identified travel markets.
Q3. Freight	Pass	Provides increased travel capacity for truck-hauled freight along I-5 within the Bridge Influence Area.
Q4. Safety	Pass	Provides a new I-5 crossing that could substantially reduce traffic levels using the existing I-5 bridges, thereby reducing the potential for collisions within the Bridge Influence Area.
Q5. Bike/Ped	Pass	Provides new Columbia River crossing with modern bike/ped pathway(s).
Q6. Seismic	Unknown	Provides new I-5 crossing built to current seismic standards. However, depending on the use of the existing I-5 bridges, they may need to be seismically upgraded to meet the new seismic criteria. It is not known at this point whether the existing bridges can be retrofitted to meet current seismic design standards.

Summary of Arterial River Crossings (RC-14, 15, 19, 21, 22, & 23)

There are six river crossing components that contain variations of an arterial roadway crossing of the Columbia River. To a degree, these six components each have strengths and weaknesses and some clearly have fatal flaws. In order for an arterial river crossing concept to pass adopted Step A screening, it must:

- provide an acceptable level of congestion relief (Q1- Traffic);
- be proximate to the I-5 corridor to both meet transit performance criteria and improve bicycle and pedestrian mobility in the I-5 corridor (Q2- Transit & Q5: Bike/pedestrian);
- address critical non-standard safety/design features in the BIA and avoid airport airspace (Q4-Safety); and
- attempt to address the seismic vulnerability of the current facility (Q6-Seismic).

The CRC project team is waiting for significant freight data that will be generated by the Regional Freight Study now underway. In the interim, limited data is available to evaluate the performance of components related to freight (Q3- Freight). For the purposes of Step A screening, the project team has considered how concepts perform regarding congestion relief as the best current surrogate for assessing a concept's freight performance.

The following table summarizes CRC project staff's assessment of how these six arterial concepts perform relative to the Step A screening questions.

Summary of Step A Screening Recommendation for Arterial River Crossing Components

	Q1 Traffic	Q2 Transit	Q3 Freight	Q4 Safety	Q5 Bike/ped	Q6 Seismic	Overall
RC-14	Note[1]	F	P	F	F	F	F
RC-15	Note[1]	F	P	F	F	F	F
RC-19	Note[1]	P	U	F	P	F	F
RC-21	F	F	F	F	F	F	F
RC-22	Note[1]	P	U	F	P	F	F
RC-23	Note[1]	P	U	P	P	U	P

[1] May provide some potential benefit in congestion management relative to 2030 No Build conditions.

P = Pass F = Fail NA = Not Applicable U = Unknown New since 3-22-06 TF meting

Question #1: Traffic and Congestion Relief

The degree of predicted traffic congestion relief for all 23 river crossing concepts ranges from lessening or maintaining current levels of afternoon/evening congestion (i.e., 4 hours or less), to worst-case scenarios where the peak period spreads substantially into the midday and evening

periods (i.e., 9 to 10 hours). All of the arterial river crossing components fall into a middle area between these extremes. Staff recommends that any arterial river crossing concept that results in:

- 8 or more hours of afternoon/evening congestion- component fails Question #1;
- 4 hrs or less of afternoon/evening congestion- component passes Question #1;
- 5 to 7 hours of afternoon/evening congestion- component is not eliminated from consideration based on this criterion because, while resulting in increased congestion and delay, it may result in other benefits.

RC-21, which would result in 8 to 9 hours of afternoon/evening congestion, fails Question #1 under this recommendation. The other five arterial river crossing components do not.

Question #2: Transit

In order for an arterial river crossing to improve transit service performance within the I-5 Bridge Influence Area and serve the key I-5 transit markets, it needs to be physically proximate to the current I-5 corridor. If it is not, it imposes unacceptable out of direction travel delays on transit, compromising the viability of serving key transit markets.

RC-19, RC-22 and RC-23 are all physically proximate to the current I-5 corridor and pass Question #2. RC-14, RC-15 and RC-21 are located one mile or more east or west of the current I-5 corridor and do not satisfy Question #2.

Question #3: Freight

As explained above, the project team has limited freight specific data against which to evaluate these arterial bridge components. Because all of these arterials but one (RC-21) provides marginal congestion relief (i.e., 6 to 7 hours), staff is proposing that only RC-21 fail for freight mobility reasons since it provides inadequate congestion relief (8-9 hours) along I-5 within the Bridge Influence Area. Concepts RC-19, RC-22 and RC-23 receive an “unknown” rating because it is not clear how they will tie into the regional arterial network and whether there would be freight mobility benefits as a result of those connections.

Because RC-14 and RC-15 provide direct connections to regionally significant freight destinations (the Ports of Portland and Vancouver and the regional freight resources adjacent to them), staff proposes they receive a “pass” on Question #3, in essence “giving them the benefit of the doubt” that these unique connections, coupled with their level of congestion relief, provide freight mobility benefits sufficient to meet the criteria of Question #3.

Question #4: Safety

In order for an arterial river crossing to improve safety within the I-5 Bridge Influence Area, it must do three things: 1) not significantly encroach into Pearson Airpark or Portland International Airport airspace, 2) maintain or improve navigational safety in the vicinity of the I-5 corridor crossings, and 3) reduce future I-5 traffic demands compared to today’s levels or redesign I-5 within the Bridge Influence Area to meet current design and safety standards to the greatest extent possible.

Only RC-21 creates an unacceptable encroachment into airport airspace and therefore should be eliminated from further consideration.

RC-14, RC-15, RC-19, and RC-22 do not make an investment in I-5 to substantially address existing non-standard design and safety features and therefore do not satisfy Question #4. As mentioned earlier, the congestion relief/demand reduction they provide falls in the marginal range.

Only RC-23 substantially addresses existing non-standard design and safety features within the I-5 Bridge Influence Area and therefore satisfies Question #4.

Question #5: Bicycle/Pedestrian Mobility

As with transit improvements, in order for an arterial river crossing to improve bicycle and pedestrian mobility within the I-5 Bridge Influence Area, its bicycle and pedestrian facilities need to be physically proximate to the current I-5 corridor and provide improved connections to the bicycle and pedestrian network.

RC-19, RC-22 and RC-23 are all physically proximate to the current I-5 corridor and could improve network connectivity, thereby satisfying Question #5. RC-14, RC-15 and RC-21 are located one mile or more east or west of the current I-5 corridor, imposing out of direction travel demands on cyclists and pedestrians seeking to move between points in the Bridge Influence Area and thus, do not satisfy Question #5.

Question #6: Seismic Vulnerability

In order for an arterial river crossing to reduce the seismic risk of the Columbia River Crossing, it must be designed to nationally accepted bridge standards and the existing I-5 bridges would need to be seismically retrofit. Note, however that it is not currently known whether the existing I-5 bridges can be retrofitted.

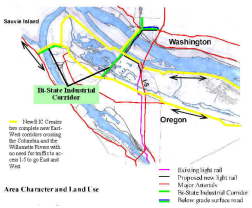
All arterial river crossing bridges would be designed to current seismic standards, however, only RC-23 proposes to seismically retrofit the existing I-5 bridges (if feasible), and therefore only RC-23 could potentially satisfy Question #6.

Summary

In summary, an arterial crossing can satisfy each of the six Step A screening questions so long as it provides:

- an acceptable level of congestion relief on I-5 to serve commuters and freight (Q1 & Q3);
- proximity to the I-5 corridor to both meet transit performance criteria and improve bike/pedestrian mobility in the I-5 corridor (Q2 & Q5);
- solutions to critical non-standard safety/design features in the BIA and avoids airport airspace (Q4);
- design upgrades to address the seismic vulnerability of the current facility (Q6).

Based on staff review of the six arterial components, RC-23 satisfies each of the Step A questions and is recommended to advance for further consideration during alternative packaging. Where appropriate, promising design features from the other five arterial components not recommended to advance could be integrated to further improve RC-23.



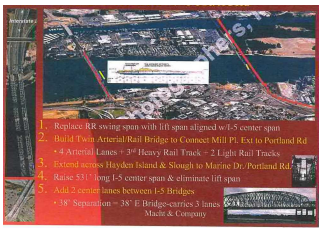
RC-14: New Corridor Crossing Near BNSF Rail Crossing

Staff Recommendation: Not Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	See note below[1]	Assuming construction of a new multi-lane tunnel under Mill Plain Blvd. and construction of high capacity interchange ramps between I-5 and Mill Plain Blvd., provides new Columbia River crossing that would serve up to 30,000 daily vehicles with most of these vehicles diverted from I-5. Some I-205 traffic shifts to I-5. By 2020, I-5 traffic demands still increase by at least 15% (by over 20,000 vehicles) over 2005 levels, resulting in 6-7 hours of afternoon/evening peak period congestion.
Q2. Transit	Fail	Does not improve transit service to identified I-5 corridor transit markets, nor does it improve the performance of the existing transit system within the I-5 Bridge Influence Area. Provides transit service along new corridor located approximately one mile west of I-5 to potential non-I-5 travel markets, but is out of direction for I-5 origins and destinations.
Q3. Freight	Pass	Results in 6-7 hours of afternoon/evening peak period congestion on I-5, however provides alternative route linking freight activity centers west of I-5.
Q4. Safety	Fail	Provides new Columbia River crossing located approximately one mile west of I-5 built to current safety standards, but does not address existing non-standard design features within the I-5 Bridge Influence Area. Traffic demands on I-5 within the Bridge Influence Area would increase by at least 15% by 2020 over 2005 conditions, resulting in 6-7 hours of afternoon/evening peak period congestion. Without added I-5 capacity and re-design of the Bridge Influence Area to meet standards, collisions would be expected to increase approximately 40 percent over 2005 conditions.
Q5. Bike/Ped	Fail	Provides new Columbia River crossing with modern bike/ped pathway(s). With a location approximately one mile west of I-5, it is out of direction for users with trip origins and destinations within the I-5 Bridge Influence Area.
Q6. Seismic	Fail	Provides new Columbia River crossing built to current seismic standards, but does not upgrade the existing I-5 bridges serving Interstate traffic and therefore the seismic risk of the I-5 bridges would not be reduced.

[1] May provide some potential benefit in congestion management relative to 2030 No Build conditions.

Note: A variation of this component was introduced at the 3-22-06 Task Force meeting. Staff evaluated the revised component and believes it fails for similar reasons as summarized above.



RC-15: New Corridor Crossing plus Widen Existing I-5 Bridges

Staff Recommendation: Not Advance

Note: It is not feasible to add two new travel lanes to I-5 between the existing bridges as this component calls for. This component is otherwise similar to RC-14 and would operate similarly.

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	See Note below[1]	Assuming construction of a new multi-lane tunnel under Mill Plain Blvd. and construction of high capacity interchange ramps between I-5 and Mill Plain Blvd., provides new Columbia River crossing that would serve up to 30,000 daily vehicles with most of these vehicles diverted from I-5. Some I-205 traffic shifts to I-5. By 2020, I-5 traffic demands still increase by at least 15% (by over 20,000 vehicles) over 2005 levels, resulting in 6-7 hours of afternoon/evening peak period congestion.
Q2. Transit	Fail	Does not improve transit service to identified I-5 corridor transit markets, nor does it improve the performance of the existing transit system within the I-5 Bridge Influence Area. Provides transit service along new corridor located approximately one mile west of I-5 to potential non-I-5 travel markets, but is out of direction for I-5 origins and destinations.
Q3. Freight	Pass	Results in 6-7 hours of afternoon/evening peak period congestion on I-5, however provides alternative route linking freight activity centers west of I-5.
Q4. Safety	Fail	Provides new Columbia River crossing located approximately one mile west of I-5 built to current safety standards, but does not address existing non-standard design features within the I-5 Bridge Influence Area. Traffic demands on I-5 within the Bridge Influence Area would increase by at least 15% by 2020 over 2005 conditions, resulting in 6-7 hours of afternoon/evening peak period congestion. Without added I-5 capacity and re-design of the Bridge Influence Area to meet standards, collisions would be expected to increase approximately 40 percent over 2005 conditions.
Q5. Bike/Ped	Fail	Provides new Columbia River crossing with modern bike/ped pathway(s). With a location approximately one mile west of I-5, it is out of direction for users with trip origins and destinations within the I-5 Bridge Influence Area.
Q6. Seismic	Fail	Provides new Columbia River crossing built to current seismic standards, but does not upgrade the existing I-5 bridges serving Interstate traffic and therefore the seismic risk of the I-5 bridges would not be reduced.

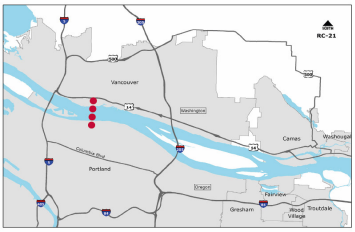
[1] May provide some potential benefit in congestion management relative to 2030 No Build conditions.

RC-19: Arterial Crossing without I-5 Improvements

Staff Recommendation: Not Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	See Note below[1]	Provides new Columbia River arterial crossing to supplement I-5. By 2020, I-5 traffic demands still increase by at least 15% (by over 20,000 vehicles) over 2005 levels, resulting in 6-7 hours of afternoon/evening peak period congestion.
Q2. Transit	Pass	Provides increased travel capacity to accommodate transit within the I-5 Bridge Influence Area serving the identified travel markets.
Q3. Freight	Unknown	Functionality for truck mobility would depend upon arterial roadway connections north and south of the Columbia River.
Q4. Safety	Fail	Provides new Columbia River crossing located immediately west of I-5 built to current safety standards, but does not address existing non-standard design features within the I-5 Bridge Influence Area. Traffic demands on I-5 within the Bridge Influence Area would increase by at least 15% by 2020 over 2005 conditions, resulting in 6-7 hours of afternoon/evening peak period congestion. Without added I-5 capacity and re-design of the Bridge Influence Area to meet standards, collisions would be expected to increase approximately 40 percent over 2005 conditions.
Q5. Bike/Ped	Pass	Provides new Columbia River crossing with modern bike/ped pathway(s).
Q6. Seismic	Fail	Provides new Columbia River crossing built to current seismic standards, but does not upgrade the existing I-5 bridges serving Interstate traffic and therefore the seismic risk of the I-5 bridges would not be reduced.

[1] May provide some potential benefit in congestion management relative to 2030 No Build conditions.



RC-21: 33rd Avenue Crossing

Staff Recommendation: Not Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Fail	Provides new Columbia River crossing to supplement I-5 and I-205 with traffic shifting from each facility to the new corridor. By 2020, I-5 traffic demands still increase by about 25% (over 30,000 vehicles) over 2005 levels, resulting in 8-9 hours of afternoon/evening peak period congestion.
Q2. Transit	Fail	Does not improve transit service to identified I-5 corridor transit markets, nor does it improve the performance of the existing transit system within the I-5 Bridge Influence Area. Provides transit service along new corridor located approximately 2-3 miles east of I-5 to potential non-I-5 travel markets, but is out of direction for I-5 origins and destinations.
Q3. Freight	Fail	Results in 8-9 hours of afternoon/evening peak period congestion on I-5.
Q4. Safety	Fail	Provides new Columbia River crossing located approximately 2-3 miles east of I-5 built to current safety standards, but does not address existing non-standard design features within the I-5 Bridge Influence Area. Traffic demands on I-5 within the Bridge Influence Area would increase by 25% by 2020 over 2005 conditions, resulting in 8-9 hours of afternoon/evening peak period congestion. Without added I-5 capacity and re-design of the Bridge Influence Area to meet standards, collisions would be expected to increase approximately 60% percent over 2005 conditions. In addition, bridge would unacceptably encroach into PDX Airport airspace.
Q5. Bike/Ped	Fail	Provides new Columbia River crossing with modern bike/ped pathway(s). With a location approximately 2-3 miles east of I-5, it is out of direction for users with trip origins and destinations within the I-5 Bridge Influence Area.
Q6. Seismic	Fail	Provides new Columbia River crossing built to current seismic standards, but does not upgrade the existing I-5 bridges serving Interstate traffic and therefore the seismic risk of the I-5 bridges would not be reduced.

RC-22: Non-Freeway Multi-modal Columbia River Crossing

Staff Recommendation: Not Advance

Note: The proposed description for this component also included elevating the existing bridges and removing the lift spans. However, that part of the proposal was determined to not be feasible.

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	See Note below[1]	Provides new Columbia River arterial crossing to supplement I-5. By 2020, northbound I-5 traffic demands still increase by about 15% (by about 20,000 vehicles) over 2005 levels, resulting in 6-7 hours of afternoon/evening peak period congestion.
Q2. Transit	Pass	Provides increased travel capacity to accommodate transit within the I-5 Bridge Influence Area serving the identified travel markets.
Q3. Freight	Unknown	Functionality for truck mobility would depend upon arterial roadway connections north and south of the Columbia River.
Q4. Safety	Fail	Provides new Columbia River crossing located immediately west of I-5 built to current safety standards, but does not address existing non-standard design features within the I-5 Bridge Influence Area. Traffic demands on I-5 within the Bridge Influence Area would increase by about 15% by 2020 over 2005 conditions, resulting in 6-7 hours of afternoon/evening peak period congestion. Without added I-5 capacity and re-design of the Bridge Influence Area to meet standards, collisions would be expected to increase approximately 40% percent over 2005 conditions.
Q5. Bike/Ped	Pass	Provides new Columbia River crossing with modern bike/ped pathway(s).
Q6. Seismic	Fail	Provides new Columbia River crossing built to current seismic standards, but does not upgrade the existing I-5 bridges serving Interstate traffic and therefore the seismic risk of the I-5 bridges would not be reduced.

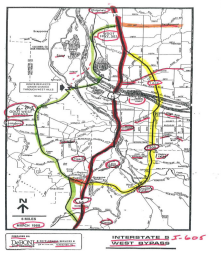
[1] May provide some potential benefit in congestion management relative to 2030 No Build conditions.

RC-23 Arterial Crossing with I-5 Improvements

Staff Recommendation: Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	See Note below[1]	Provides new Columbia River arterial crossing to supplement I-5. By 2020, I-5 traffic demands still increase by at least 15% (by over 20,000 vehicles) over 2005 levels, resulting in 6-7 hours of afternoon/evening peak period congestion.
Q2. Transit	Pass	Provides increased travel capacity to accommodate transit within the I-5 Bridge Influence Area serving the identified travel markets.
Q3. Freight	Unknown	Functionality for truck mobility would depend upon arterial roadway connections north and south of the Columbia River.
Q4. Safety	Pass	Provides new Columbia River crossing located immediately west of I-5 built to current safety standards. Provides safety improvements to I-5 within the Bridge Influence Area that significantly addresses critical existing non-standard design and safety features.
Q5. Bike/Ped	Pass	Provides new Columbia River crossing with modern bike/ped pathway(s).
Q6. Seismic	Unknown	Provides new Columbia River crossing built to current seismic standards for arterial roadway and upgrades the existing I-5 bridges serving Interstate traffic, if feasible.

[1] May provide some potential benefit in congestion management relative to 2030 No Build conditions.

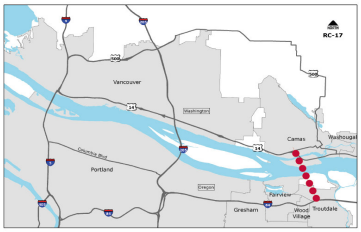


RC-16: New Western Highway

Staff Recommendation: Not Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	See Note below[1]	Provides new Columbia River crossing that would serve about 25,000 daily vehicles, with most of these vehicles diverted from I-5. Some I-205 traffic shifts to I-5. By 2020, I-5 traffic demands still increase by about 20% (25,000 vehicles) over 2005 levels, resulting in 7-8 hours of afternoon/evening peak period congestion.
Q2. Transit	Fail	Does not improve transit service to identified I-5 corridor transit markets, nor does it improve the performance of the existing transit system within the I-5 Bridge Influence Area. Provides transit service along new corridor located approximately 2-3 miles west of I-5 to potential non-I-5 travel markets, but is out of direction for I-5 origins and destinations.
Q3. Freight	Fail	Results in 7-8 hours of afternoon/evening peak period congestion on I-5.
Q4. Safety	Fail	Provides new Columbia River crossing located approximately 2-3 miles west of I-5 built to current safety standards, but does not address existing non-standard design features within the I-5 Bridge Influence Area. Traffic demands on I-5 within the Bridge Influence Area would increase by 20% by 2020 over 2005 conditions, resulting in 7-8 hours of afternoon/evening peak period congestion. Without added I-5 capacity and re-design of the Bridge Influence Area to meet standards, collisions would be expected to increase approximately 45% percent over 2005 conditions.
Q5. Bike/Ped	Fail	Provides new Columbia River crossing with modern bike/ped pathway(s). With a location approximately 2-3 miles west of I-5, it is out of direction for users with trip origins and destinations within the I-5 Bridge Influence Area.
Q6. Seismic	Fail	Provides new Columbia River crossing built to current seismic standards, but does not upgrade the existing I-5 bridges serving Interstate traffic and therefore the seismic risk of the I-5 bridges would not be reduced.

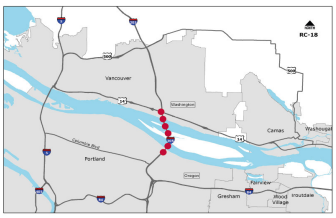
[1] May provide some potential benefit in congestion management relative to 2030 No Build conditions.



RC-17: New Eastern Columbia River Crossing

Staff Recommendation: Not Advance

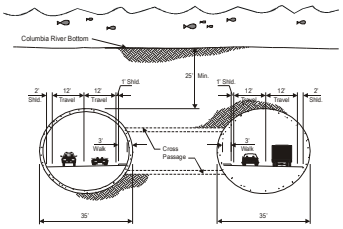
Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Fail	Provides new Columbia River crossing to supplement I-205 corridor with most users shifting from I-205. By 2020, I-5 traffic demands still increase by at least 30% (over 40,000 vehicles) over 2005 levels, resulting in 9-10 hours of afternoon/evening peak period congestion.
Q2. Transit	Fail	Does not improve transit service to identified I-5 corridor transit markets, nor does it improve the performance of the existing transit system within the I-5 Bridge Influence Area. Provides transit service along new corridor located approximately 10-12 miles east of I-5 to potential non-I-5 travel markets, but is out of direction for I-5 origins and destinations.
Q3. Freight	Fail	Results in 9-10 hours of afternoon/evening peak period congestion on I-5.
Q4. Safety	Fail	Provides new Columbia River crossing located approximately 10-12 miles east of I-5 built to current safety standards, but does not address existing non-standard design features within the I-5 Bridge Influence Area. Traffic demands on I-5 within the Bridge Influence Area would increase by at least 30% by 2020 over 2005 conditions, resulting in 9-10 hours of afternoon/evening peak period congestion. Without added I-5 capacity and re-design of the Bridge Influence Area to meet standards, collisions would be expected to increase approximately 65 percent over 2005 conditions.
Q5. Bike/Ped	Fail	Provides new Columbia River crossing with modern bike/ped pathway(s). With a location approximately 10-12 miles east of I-5, it is out of direction for users with trip origins and destinations within the I-5 Bridge Influence Area.
Q6. Seismic	Fail	Provides new Columbia River crossing built to current seismic standards, but does not upgrade the existing I-5 bridges serving Interstate traffic and therefore the seismic risk of the I-5 bridges would not be reduced.



RC-18: I-205 Improvements

Staff Recommendation: Not Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Fail	Upgrades I-205 corridor by adding one lane per direction between I-5 to the north and I-84 to the south. By 2020, I-5 traffic demands still increase by about 30% (over 40,000 vehicles) over 2005 levels, resulting in 9-10 hours of afternoon/evening peak period congestion.
Q2. Transit	Fail	Does not improve transit service to identified I-5 corridor transit markets, nor does it improve the performance of the existing transit system within the I-5 Bridge Influence Area. May increase transit service along I-205 located approximately 7 miles east of I-5 to potential non-I-5 travel markets, but is out of direction for I-5 origins and destinations.
Q3. Freight	Fail	Results in 9-10 hours of afternoon/evening peak period congestion on I-5.
Q4. Safety	Fail	Provides improvements to existing I-205 corridor located approximately 7 miles east of I-5, but does not address existing non-standard design features within the I-5 Bridge Influence Area. Traffic demands on I-5 within the Bridge Influence Area would increase by 30% by 2020 over 2005 conditions, resulting in 9-10 hours of afternoon/evening peak period congestion. Without added I-5 capacity and re-design of the Bridge Influence Area to meet standards, collisions would be expected to increase approximately 65 percent over 2005 conditions.
Q5. Bike/Ped	Fail	Does not improve existing I-5 bike/ped pathways. May improve I-205 bike/ped pathway(s), but with a location approximately 7 miles east of I-5, it is out of direction for users with trip origins and destinations within the I-5 Bridge Influence Area.
Q6. Seismic	Fail	Does not upgrade the existing I-5 bridges serving Interstate traffic and therefore the seismic risk of the I-5 bridges would not be reduced.



RC-20: Replacement Tunnel

Staff Recommendation: Not Advance

Step A Question	Pass/ Fail	Reasons
Q1. Traffic	Fail	Increases vehicular capacity along I-5 in the Bridge Influence Area by adding new travel lanes. Capacity is underground and would require an elaborate frontage road network to serve SR 14, Vancouver City Center and Hayden Island- resulting in substantial out of direction travel for drivers. Tunnel would connect above ground to interchanges north of SR 14 and south of Hayden Island.
Q2. Transit	Fail	Tunnel alignment results in significant out-of-direction travel for transit to serve I-5 transit markets. Would require elaborate frontage road system to link I-5 activity centers.
Q3. Freight	Fail	Tunnel alignment results in significant out-of-direction travel for freight to serve I-5 freight activity centers. Would require elaborate frontage road system to link I-5 activity centers.
Q4. Safety	Pass	Provides new Columbia River crossing built to current safety standards.
Q5. Bike/Ped	Fail	Tunnel alignment creates significant out-of-direction travel for bike/ped users to reach I-5 activity centers with the Bridge Influence Area. Not desirable to serve bicyclists and pedestrians via a tunnel.
Q6. Seismic	Pass	Provides I-5 crossing built to current seismic standards.

Columbia River CROSSING

Attachment F

Components Step B Screening Report

Columbia River CROSSING

DRAFT COMPONENTS STEP B SCREENING REPORT

June 9, 2006

DRAFT COMPONENTS STEP B SCREENING REPORT

June 9, 2006

Columbia River CROSSING

Table of Contents

List of Tables

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ACRONYMS

AA	Alternatives Analysis
ADA	Americans with Disabilities Act
AGT	Automated Guideway Transit
BNSF	Burlington Northern Santa Fe Railroad
BRT	Bus Rapid Transit
CRC	Columbia River Crossing
CRD	Columbia River Datum
DEIS	Draft Environmental Impact Statement
EIS	Environmental Impact Statement
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HOV	High Occupancy Vehicle
I-5	Interstate 5
LRT	Light Rail Transit
NEPA	National Environmental Policy Act
ODOT	Oregon Department of Transportation
PDX	Portland International Airport
PRT	Personal Rapid Transit
RTC	Regional Transportation Council
RC	River Crossing
SOV	Single Occupant Vehicle
TR	Transit
TSM/TDM	Traffic System Management/Traffic Demand Management
WSDOT	Washington State Department of Transportation

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1. Overview of Evaluation Process

In 1998, in response to evidence of growing congestion in the Portland-Vancouver I-5 corridor, leaders in the region came together to study the problem and potential solutions. This effort continues today as the Columbia River Crossing (CRC) Project Team works to identify and refine appropriate solutions to improve mobility and livability in the I-5 corridor. This current effort builds upon previous studies and will narrow potential transportation solutions to those that best meet the Purpose and Need Statement and Vision and Values Statement identified for the corridor.

The screening and evaluation of potential transportation improvements is part of the I-5 CRC Alternatives Analysis (AA) and the Environmental Impact Statement process. There are several steps to screening and evaluation. In Step A, a broad range of potential transportation improvements (also known as "components") was initially screened against up to six pass/fail questions derived directly from the project's Problem Definition. To determine if each component offers an improvement, it was compared to the No Build condition, which includes transportation improvements adopted in the regional transportation plans, but no additional improvements at the Columbia River crossing. In Step A, a component was eliminated from further consideration if it failed (characterized as a fatal flaw) any of the questions that pertain to that component. Through Step A screening, the initial list of 14 transit components was narrowed to seven (7) and the initial list of 23 river crossing components was narrowed to nine (9).

In Step A, only the transit and river crossing components were screened. Components in the Pedestrian, Bike, Freight, Roadways, and TSM/TDM categories were not evaluated because their performance would depend upon how they were integrated with promising transit and/or river crossing improvements. Components in these categories (e.g., Ramp Queue Jump Lanes) could be implemented in a wide variety of ways, and will be paired with complementary transit and river crossing components during alternatives packaging, described subsequently in this report. Readers should refer to the *Components Step A Screening Report* for more information regarding the Step A methods and findings.

1.1 Step B Screening Findings and Conclusion

While each of the seven transit and nine river crossing components that advanced through Step A screening has its respective strengths and weaknesses, the Step B screening found that there are relatively few dramatic differences between the remaining components, and that these differences are not large enough to warrant completely eliminating any additional river crossing or transit components from further consideration. The next sections of this report describe some of the key findings from the Step B screening, and also describe staff recommendations regarding how to proceed based on these findings.

1.2 What's Inside

This *Components Step B Screening Report* describes how the narrowed range of components was further evaluated and screened, and presents the results of that screening. Components advanced from this second round of screening will be packaged into multi-modal alternative packages. These alternative packages will then be further evaluated and screened using the same Step B performance measures and new data. Subsequently, a short-list of the most promising alternatives will be advanced into the I-5 CRC Draft Environmental Impact Statement (DEIS).

The AA and DEIS will be published in late 2007, and will provide analysis and findings to help the public and agencies to understand the consequences, characteristics and other considerations associated with these alternatives. This will also help inform recommendations and decisions regarding a preferred alternative.

2. Step B Methods

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 Task Force's *Vision and Values Statement*. As mentioned previously, components in the freight, roadways, pedestrian, bike, and TSM/TDM categories were not evaluated in Steps A and B, but rather will be paired with complementary transit and river crossing components during alternatives packaging.

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

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[1]
9. Growth Management/Land Use[1]
10. Constructability[1]

Measures in categories 8 through 10 (Costs, Growth Management, Constructability) were not considered in Step B screening of components, and instead will be assessed subsequently during alternatives package screening and/or alternative evaluation.

In Step B, project staff evaluated each of the remaining transit and river crossing components using data drawn from previous transportation and environmental studies, conceptual river crossing designs, and professional experience. The components were evaluated based on their ability to satisfy the performance measures *relative to other components in the same category*. The appendix describes in more detail the specific performance measures that staff addressed, and issues and data that staff considered.

[1] Criteria in these categories were not applied in Step B.

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3. Step B Evaluation of Transit Components

Six transit components passed Step A screening and were assessed using Step B screening on performance measures in three of the 10 community values categories. The three categories are:

2. Mobility, Reliability, Accessibility, Congestion Reduction, and Efficiency
3. Modal Choice
5. Regional Economy, Freight Mobility

Measures in the other categories (e.g., residential displacements, safety) were not addressed because the necessary information (e.g., detailed transit alignments) has not been developed yet. In Step B, the transit components were assessed based on their typical modal attributes and based on findings from previous I-5 studies. Readers should refer to the *Components Step A Screening Report* for descriptions of the transit components that were assessed in Step B:

- TR-1 Express Bus in General Purpose Lanes
- TR-2 Express Bus in Managed Lanes
- TR-3 BRT Lite
- TR-4 BRT Full
- TR-5 Light Rail
- TR-6 Streetcar

3.1 Key Findings

This section describes some of the key findings for the transit components. This information will be considered when the transit components are subsequently paired with river crossing and other components (e.g. TDM/TSM) to create logical and potentially effective alternatives packages.

Disclaimer: *The following results were produced during the I-5 Partnership Study and represent transit modal characteristics on a general scale. The CRC project team will re-evaluate the transit modes to better define and estimate the potential performance of each mode in the 2030 forecast year.*

3.1.1 Mobility, Reliability, Accessibility, Congestion Reduction, and Efficiency

1. Based on modeling completed for the I-5 Partnership, *transit travel times* would be faster for modes operating in their own right-of-way or exclusive lanes. Modeling completed for that study resulted in the following PM peak period transit travel times from downtown Portland to Downtown Vancouver in year 2020:

    a. Express Buses in General Purpose Lanes = 40 minutes

    b. Express Buses in Managed Lanes = 35 minutes

c. BRT-Full = 25 minutes

d. Light Rail = 25 minutes

Streetcar service was not modeled in the I-5 Partnership Study, but based on streetcar's typical operating speeds, this same trip is estimated to take approximately 50 minutes.

2. Based on the year 2020 modeling, *transit ridership* would be highest for modes operating in their own right-of-way, and with higher carrying capacities (discussed in the next section). The modeling resulted in the following PM peak period transit ridership for all transit service crossing the Columbia River in both directions:

    a. Express Buses in General Purpose Lanes = 6,500 riders

    b. Express Buses in Managed Lanes = 9,000 riders

    c. BRT-Full = 10,500 riders

    d. Light Rail = 12,500 riders

    Streetcar service was not modeled in the I-5 Partnership Study, but based on streetcar's typical operating characteristics, ridership is estimated to be approximately 6,500 riders.

3. Transit modes that operate in exclusive rights-of-way and capture enough trips to reduce passenger vehicle demand in the I-5 corridor and within the Bridge Influence Area would result in the greatest *reduction in travel times and delay, reduce the number of hours of daily highway congestion, and improve vehicle throughput in the I-5 corridor and within the Bridge Influence Area*. Bus rapid transit-full and light rail transit would best meet these objectives, followed by express buses in managed lanes and bus rapid transit-lite.

3.1.2 Modal Choice

1. Based on typical transit vehicle types, seating capacities, and service frequencies, the following *transit carrying capacities* during a peak hour could be expected in the Bridge Influence Area:

    a. Express Buses in General Purpose Lanes = 3,000 to 10,000 passengers per day

    b. Express Buses in Managed Lanes = 4,000 to 15,000 passengers per day

    c. BRT-Full = 10,000 to 25,000 passengers per day

    d. Light Rail = 10,000 to 25,000 passengers per day

    e. Streetcar = 4,000 to 12,000 passengers per day

2. Regarding *service flexibility* and the *ability to serve the I-5 transit markets*, the bus-based components are potentially able to provide direct service to all of the I-5 markets because they can operate on virtually any roadway. In comparison, the rail-based components (light rail and streetcar) would directly serve only a few Clark County markets (e.g., downtown Vancouver), because the transit service cannot leave its dedicated right-of-

way, and the rail alignment terminus would be located within the narrowly defined Bridge Influence Area. However, they would provide access to much of the C-TRAN service area with a transfer. Transit support service can be designed to maximize its potential to capture transit market outside the I-5 Bridge Influence Area and broader I-5 corridor.

3. Transit modes that operate in exclusive rights-of-way and capture enough trips to reduce passenger vehicle demand in the I-5 corridor and within the Bridge Influence Area have the greatest potential to *increase vehicle occupancy in the I-5 corridor and within the Bridge Influence Area*. Bus rapid transit-full and light rail transit would likely best meet these objectives, followed by express buses in managed lanes and bus rapid transit-lite.

3.1.3 Regional Economy, Freight Mobility

1. Transit modes that operate in exclusive rights-of-way and capture enough trips to reduce passenger vehicle demand in the I-5 corridor and within the Bridge Influence Area would result in the greatest *reduction in travel times and delay for vehicle-moved freight, reduce the number of hours of congestion for vehicle-moved freight, and improve truck throughput in the I-5 corridor and within the Bridge Influence Area*. Bus rapid transit-full and light rail transit would best meet these objectives, followed by express buses in managed lanes and bus rapid transit-lite.

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4. Step B Evaluation of River Crossing Components

This section describes the results of the Step B evaluation of river crossing components. The nine river crossing components that passed Step A screening were assessed on performance measures in seven of the 10 community values categories under Step B component screening. These seven categories are:

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

Readers should refer to the *Components Step A Screening Report* for descriptions of the river crossing components that were assessed in Step B:

- RC-1 Replacement/Downstream/Low-Level/Moveable Bridge
- RC-2 Replacement/Upstream/Low-Level/Moveable Bridge
- RC-3 Replacement/Downstream/Mid-Level Bridge
- RC-4 Replacement/Upstream/Mid-Level Bridge
- RC-7 Supplemental/Downstream/Low-Level/Moveable Bridge
- RC-8 Supplemental/Upstream/Low-Level/Moveable Bridge
- RC-9 Supplemental/Downstream/Mid-Level Bridge
- RC-13 Tunnel to Supplement I-5
- RC-23 Arterial Supplemental Bridge

4.1 Key Findings

This section describes some of the key findings for the river crossing components. This information will be considered when the river crossing components are subsequently paired with transit and other components (e.g. TDM/TSM) to create logical and potentially effective alternatives packages.

4.1.1 Community Livability and Human Resources

1. The above-ground river crossing components would not have significantly different impacts regarding residential exposure to unacceptable traffic noise levels. In comparison, the tunnel option would subject fewer residences to traffic noise.

2. None of the river crossing components appears likely to result in significant residential displacements. As design advances, this may change.

3. Business displacement impacts would be roughly equivalent for all crossing options.

4. The above-ground river crossing components would not have significantly different impacts to known historic, archeological, and resource properties, although the impacted locations would differ. Resources that could be impacted include: Fort Vancouver, Old Apple Tree Park, Jantzen Beach, the Columbia River Bridges (historic structures), and/or the Downtown Vancouver District. In comparison, the tunnel option would preserve the historic bridges but could have greater impacts to archeological resources.

5. Similarly, the above-ground river crossing components would not have significantly different impacts to parks and recreation lands, although the impacted locations would differ. Resources that would be impacted include: Old Apple Tree Park, Waterfront Park, and/or Fort Vancouver.

4.1.2 Mobility, Reliability, Accessibility, Congestion Reduction, and Efficiency

The Step B analysis focused on the impacts the river crossing components would have on Light Rail Transit only, as Express Bus and Bus Rapid Transit service would be largely unaffected by the location or height of a replacement or supplemental highway bridge. (It should be noted, however, that *bus transit* would perform worse under RC-23 Arterial Supplemental Bridge, since buses would remain in the existing I-5 general purpose lanes, which have sub-standard designs.)

1. Transit throughput and delay is affected by bridge lifts. All of the replacement or supplemental highway bridges would be built high enough to allow all barges (comprising over 90% of river traffic) to pass under it. Therefore, bridge lifts would be infrequent (perhaps once a week) and would not be allowed during peak commuter periods.

2. Light rail operating on an existing I-5 bridge would be affected by relatively more bridge lifts throughout the day, even if a peak-period bridge lift moratorium remained in effect.

3. Light rail travel times on an existing I-5 bridge would be slower than on a new bridge due to steep grades with inadequate vertical curves, and would likely have tighter turns at the

ends of the bridge. For RC-23 Arterial Supplemental Bridge, light rail would probably operate on the new arterial bridge, and the grade and turn problems would be reduced.

4. If light rail were to operate on a supplemental highway bridge, it would be difficult, expensive, and impactful to integrate with RC-8 Supplemental/Upstream/Low Bridge. This connection would require the tracks to cross over the existing I-5 traffic lanes, resulting in a Hayden Island station elevated more than 40 feet in the air. In addition, the tracks could not go over the existing bridge superstructures and would have to go around the bridge ends, resulting in awkward geometry and very slow transit movements. RC-8 therefore assumed that light rail would operate on an existing I-5 bridge.

5. Assuming increased I-5 capacity is provided, all of the replacement and supplemental bridge components located within the I-5 corridor (RC-1 through RC-12, plus RC-23) would likely result in the *reduction in travel times and delay, reduce the number of hours of daily highway congestion, and improve vehicle throughput in the I-5 corridor and within the Bridge Influence Area*.

4.1.3 Modal Choice

1. Transit alignments that can go under the BNSF berm that parallels SR-14 (i.e. low-level bridges) will provide better connectivity and redevelopment opportunities at Vancouver's waterfront west of the I-5 Bridge, and low-level bridges would best provide for nearby LRT stations. However, they introduce delays to service due to bridge lifts with varying effects based on the height of the bridge.

2. Mid-level replacement bridges allow light rail to clear the BNSF berm and match street grades by 6th St.

3. The RC-9 Supplemental/Downstream/Mid-Level Bridge would be more than 20 feet higher than a Replacement Bridge at the BNSF berm (to provide higher clearance over the north shipping channel). The RC-9 alignment could not allow an LRT alternative to match downtown street grades until north of 6th Street. Local traffic and bus circulation would be significantly impacted, requiring the southern-most transit station to be located further north.

4. All of the replacement and supplemental bridge components located within the I-5 corridor (RC-1 through RC-12 and RC-23) would provide an improved multi-use pathway for pedestrians and bicyclists across the Columbia River, thereby substantially *improving bicyclist and pedestrian mobility and connectivity in the I-5 corridor and within the Bridge Influence Area*. None of the other components would improve bicyclist and pedestrian mobility, as none of them would provide a multi-use pathway.

5. Assuming that I-5 corridor improvements (e.g., RC-1 through RC-12, plus RC-23) would all be constructed with managed lanes, moderate levels of vehicular occupancy would be expected along I-5.

4.1.4 Safety

1. The existing bridges do not meet current design standards and have a design speed of only 35 mph. Replacement or supplemental low-level bridges would provide for better (i.e. standard) connections at SR-14 and Hayden Island. A lower profile would also have flatter grades on I-5 benefiting truck/freight operations. Mid-level crossings would have steeper grades on I-5 and may make connections to SR-14 and Hayden Island more difficult, but still within safety guidelines.

2. All potential crossings would improve bike and pedestrian connectivity by improving facilities on the existing bridges or including new facilities on new crossings (except for a tunnel).

3. A downstream alignment would hinder marine navigation by making it more difficult for river traffic to line up with the railroad bridge downstream, whereas an upstream alignment would be less restrictive[2]. A low-level bridge would limit the height of traffic that can pass under the bridge without a lift operation, whereas a mid-level bridge would allow most marine vessels (including all identified commercial marine traffic) to pass under. Any option that retains the existing I-5 bridges creates a significant challenge for marine traffic, which would have to navigate multiple sets of piers in the water.

4. Supplemental bridge components, which retain the existing I-5 bridges, would have the most encroachment into the Pearson Airpark airspace due to the existing tower heights. Potential downstream alignments are further away from Pearson Airpark, resulting in less encroachment into the airspace. Low level crossings also result in less encroachment. Conversely, upstream alignments or mid-level structures result in more encroachment into the airspace.

5. All new replacement or supplemental bridges (or tunnels) would be designed to withstand a seismic event. Retaining the existing I-5 bridges would require significant retrofits in order to withstand a seismic event.

6. All of the new highway crossings would greatly improve incident/emergency response as they would all provide full shoulder widths.

4.1.5 Regional Economy, Freight Mobility

1. Regarding marine traffic, keeping the existing I-5 bridges would maintain the "no lift" period. Building a replacement low-level bridge would shorten the "no lift" period because the new closed position would be higher than the current closed position. A replacement mid-level bridge would be a fixed bridge, and would eliminate the "no lift" period.

2. Assuming increased capacity for I-5 is provided, all of the replacement and supplemental bridge components located within the I-5 corridor (RC-1 through RC-12, plus RC-23) would result in the *reduction in travel times and delay for vehicle-moved freight, reduce*

[2] Moving the span in the railroad bridge is a potential solution to address navigational problems.

the number of hours of congestion for vehicle-moved freight, and improve truck throughput in the I-5 corridor and within the Bridge Influence Area.

4.1.6 Stewardship of Natural Resources

1. The above-ground river crossing components do not have significantly differing impacts to fish and wildlife habitat and endangered species. The tunnel option, however, would have greater impacts due to the trenching needs for the tunnel. This would also likely have greater impact to sensitive archeological resources and upland historic resources.

2. None of the river crossing components appear likely to have adverse impacts to threatened or endangered plant species. However, plant surveys have not been completed to date.

3. The current design footprints show no impacts to known wetlands. Further investigation will occur in summer 2006.

4. Options that provide a supplemental bridge or tunnel would increase impervious surfaces and have potentially greater impacts on water quality compared to options that replace the existing I-5 bridge.

4.1.7 Distribution of Benefits and Impacts

1. The current design footprints show that all of the river crossing components would have a low likelihood for residential property acquisition and would have similar traffic noise impacts in residential areas. There is a small potential for disproportionate impacts to low income and minority populations associated with the river crossing components. This will be further evaluated when the river crossing components are packaged into complete alternatives for further study prior to the draft EIS.

2. Other impacts, such as travel time benefits, are likely to affect residents throughout the I-5 corridor (i.e. north and south of the Bridge Influence Area), and disproportionate impacts will be identified later in the project.

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5. Staff Recommendations

The Step A and Step B screening are the first steps in the complete project Screening and Evaluation Framework, which was developed before the full list of components was known (i.e. prior to the component scoping process). The intent of the Step B screening was to subject the components remaining after Step A to a more detailed set of criteria and scrutiny, so that only the most promising and potentially effective components would be advanced into alternatives packaging and modeling.

During the Step A screening a significant number of components (nearly half) were eliminated from further consideration. Thus, the number of components to be considered in Step B was fewer than originally envisioned, and the findings presented in this report show that the expected performance and impacts of the components do not differ significantly.

Project staff recommends that all the transit and river crossing components evaluated in this report remain viable components for alternative packaging, and that none be removed from further consideration based on this Step B screening. Key reasons for this recommendation are:

- The replacement bridge, supplemental bridge and tunnel components each have their respective strengths and weaknesses. This evaluation does not reveal any "fatal flaws" or conclusive "winners". It is also possible that some differences in performance and impacts can be lessened pending further engineering, operations, and construction analysis.
- Transit components TR-1 Express Buses in General Purpose Lanes and TR-6 Streetcar are expected to perform worse than the other transit components. These components should be retained, however, for the following reasons:
    - TR-1 should be retained because this component will be part of at least one low-investment alternative that will be modeled (e.g., the No-Build and TSM/TDM alternatives). In addition, in the event that the project is not able to reach consensus regarding more promising transit options (e.g., transit in its own right-of-way, or in managed lanes), new general purpose capacity could still potentially improve transit operations compared to current conditions.
    - TR-6 should be retained pending further analysis by TriMet. TriMet is conducting a separate study to determine the feasibility of operating streetcars in the Interstate MAX right-of-way from Expo to Rose Quarter or downtown Portland. Issues that are being studied include:
        - Technology compatibility (streetcars are shorter and narrower than light rail vehicles, and have lower top operating speeds)
        - Transit operations (e.g. headways, signaling, additional trackage)
        - Safety (i.e. in a collision, how would different vehicle types fare?)

      The results of the TriMet analysis will be presented in a separate report.

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6. Next Steps – Alternatives Packaging

The alternative packaging step of the project will bring together for further development and evaluation all of the various components that passed through the Step A and B screening. The alternative packages that result will be considered in more detail over the next several months, and by late 2006, project staff will begin presenting the results of the analyses, including the application of the evaluation criteria, to compare and contrast each alternative package.

Ideas from each of the eight component categories will be combined to form project alternative packages. The principles used to form the alternatives include:

1. All components that pass Step A will be considered for inclusion in one or more alternatives.
2. Alternatives should be organized by theme – for example, what is (are) the key feature(s)?
3. Alternatives should represent a full range of potential transportation solutions, within the limits of the components that have passed Step A (those that have been determined to address the Purpose and Need).
4. Complementary components should be packaged together.
5. Alternatives should be structured to identify strengths and weaknesses of individual components.
6. Well-performing components may be re-packaged with other alternatives for the DEIS.

The packaged alternatives will be developed primarily to test individual components. Staff expects that the alternatives subsequently selected for consideration in the DEIS will include hybrids of the alternatives that are evaluated this spring and summer.

Under the National Environmental Policy Act (NEPA), one of the alternatives considered must be a no-build alternative. It will include only existing facilities and services, as well as projects in the adopted Metro and Southwest Washington regional transportation plans that can be reasonably anticipated for construction. Another alternative that will be considered will focus on transportation demand management (TDM) policies and techniques, without major capital investments in either roadways or high capacity transit (although this would include additional regular bus service to reduce auto demand).

Beyond these initial two alternatives, others will focus on a mix of investments in transit, roadway capacity, and components from each of the other groups (river crossing, freight, etc.). As an organizing principle, the alternatives will represent a range of investment scenarios, from those with a transit-intensive focus, to a more balanced transit/roadway approach, to a roadway capacity focus.

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7. Appendix – Detailed Step B Screening Methods

The following table (**Table A-1**) presents the methodology used by the project team in conducting Step B screening. The table summarizes the adopted Step B screening criteria and associated performance measures. It also summarizes information gathered to support screening and any considerations that affected screening.

Table A-1. I-5 Columbia River Crossing - Draft Evaluation Framework				
Step B: Component Screening Measures and Proposed Approach – January 17, 2006				
Component Screening Measure		**Question**	**Information Sources and Methods**	**Considerations or Caveats**
Number	**Description**			
Community Livability and Human Resources				
1.1	Magnitude of residential properties within approximate noise impact contour	How many residential properties will fall within the 66 dBA (WA) or 65 dBA (OR) residential noise impact contour?	This will use 2020 traffic model runs; peak hour and peak truck hour traffic information with vehicle splits from traffic consultant. Contours from this data will be overlaid upon taxlot data in GIS format from Metro RLIS and Clark County	Analysis will be based on a 2-dimensional analysis and preliminary alignments and will not be as accurate as 3-dimensional modeling with preliminary design information. It will allow a general comparison of alternatives.
1.4	Magnitude of residential properties crossed by component's conceptual footprint	How many residential units fall within the design area footprint?	Tax lot data and land use information in GIS format from Metro RLIS and Clark County. Building permit data from cities of Portland and Vancouver will supply the number residential units for each parcel.	Must account for multi-family uses.
1.5	Magnitude of commercial/industrial properties crossed by component's conceptual footprint	How many commercial or industrial properties fall within the design area footprint?	Tax lot data and land use information in GIS format from Metro RLIS and Clark County. Field surveys will verify the number of business impacted. Acres and number of businesses will be averaged to produce one value.	May also consider the number of jobs for each commercial or industrial property. Note: Another impact, equally significant as a "hit" may be the loss of accessibility. We're assuming that information necessary to screen for this won't be available until further in the alternatives development process.

1.6	Magnitude and significance of historic, archaeological and cultural (i.e., TCP) resource properties within conceptual footprint.	How many historic, archaeological, and cultural (i.e., TCP) properties fall within the design area footprint by the following categories? · National Register listed · Potentially eligible, as determined by historic resources tech team. · National Historic Site What it the total acreage of these properties?	Tax lot data from Metro RLIS and Clark County. Historic Resources information from Clark County and SHPO, review by tech team (historic). Area (acres) of impact to districts, and number of sites impacted will be measured. These will be averaged to produce one value.	Will require coordination with historic resources tech team to review questionable resources.
1.7	Magnitude and significance of public park and recreation resources crossed by component's conceptual footprint	How many 4(f) public parks fall within the design area footprint?	Tax lot data and public parks from Metro RLIS and Clark County Area of impact to 4(f) properties, area impact to districts, and number of 4(f) historic properties will be measured. These will be averaged to produce one value.	May require some data input from field maps and/or local jurisdiction maps on some parks in Oregon. Schools and 6(f) records should be included in this analysis.
Mobility, Reliability, Accessibility, Congestion Reduction, and Efficiency				
2.1	Potential (on a qualitative scale) for component to improve peak period passenger vehicle travel times and delay in the I-5 corridor and within the bridge influence area	Average general purpose travel times	2020 traffic model runs and estimates.	
2.2	Potential (on a qualitative scale) for component to reduce peak period travel time and delay for transit vehicles in the I-5 corridor and within the bridge influence area	• Average transit vehicle speeds by mode • River crossing profiles	• For river crossings, upstream bridges that add travel time and delay for transit vehicles accessing downtown Vancouver will be ranked lower over comparable downstream bridges • For TDM/TSM, components that increase transit vehicle speeds will rank higher than those that do not	• Vehicle speeds for various transit modes modeled in partnership work • Average transit vehicle delay in I-5 corridor was modeled in partnership work

			• This criteria is not applicable to bike, pedestrian, and freight components	
2.3	Potential (on a qualitative scale) for component to reduce the number of hours of daily highway congestion in the I-5 corridor and within the bridge influence area	How much will the component reduce the duration of congestion compared to No Build conditions?	2020 traffic model runs and estimates.	
2.5	Potential (on a qualitative scale) for component to increase the level of persons crossing Columbia River via I-5 by mode	• Average transit ridership by mode • River crossing profiles	• For river crossings, bridge options that provide a fixed (not-movable) span will be ranked higher over other bridge options with movable spans • For TDM/TSM, components that encourage multiple occupant vehicles (HOV, etc.) will rank higher than those that do not • This criteria is not applicable to bike, pedestrian, and freight components	• Average transit ridership, and transit revenue hours, modeled and reported in partnership work • Average transit industry ridership statistics can also be used
2.6	Potential (on a qualitative scale) for component to increase the level of vehicles by mode crossing Columbia River via I-5	How many vehicles can a component serve?	2020 traffic model runs and estimates.	
Modal Choice				
3.1	Potential (on a qualitative scale) for increasing transit capacity as a percentage of total daily capacity and peak period capacity across the I-5 Columbia River bridge	• Average transit carrying capacity by mode	• For river crossings, bridge options that provide for an at-grade transit alignment at the BNSF rail line will rank higher than those where the transit alignment is elevated over the BNSF rail line	• Criteria measures *capacity* and not *ridership*

		• River crossing profiles	• For TDM/TSM, components that contribute to transit carrying capacity will rank higher than those that do not	• Need to define transit capacity in terms of thousands per revenue hour
			• This criteria is not applicable to bike, pedestrian, and freight components	• Need to make some basic assumptions regarding headways and vehicle sizes
3.2	Potential (on a qualitative scale) to improve transit service in the I-5 corridor to identified travel markets considering frequency, connectivity, span of hours, number of transfers, and travel time	• Flexibility to serve identified travel markets	• For river crossings, bridge options that preclude future transit service to downtown Vancouver, Hayden Island, or the Lombard Street Transit Center will be ranked lower over other bridge options that allow for transit access (either directly or indirectly) to these locations	• Can the mode or component assist in serving the identified travel markets?
		• River crossing profiles	• For TDM/TSM, components that can augment or improve transit service in and to identified transit markets will rank higher than those that do not	• Is the mode flexible enough to serve all the identified markets simultaneously?
			• This criteria is not applicable to bike, pedestrian, and freight components	
3.3	Ability (on a qualitative scale) to improve connectivity of bicycle and pedestrian trips in the I-5 corridor and through the bridge influence area	Can a component provide a multi-use pathway in the I-5 corridor and improve connections?	Definition of component.	
3.4	Potential (on a qualitative scale) for component to increase vehicle occupancy in the I-5 corridor and within the bridge influence area	Can a component increase the number of non-SOV users?	2020 traffic model runs and estimates.	

Safety				
4.1	Enhance Vehicle/Freight Safety		· Conceptual plan and profile or other drawings provided by outside parties	· A lower, flatter I-5 profile provides better standard ramp connections on the interchanges on either side. Flatter grades also allow for better truck operation.
4.2	Enhance Bike/Ped Facilities and Safety		· Conceptual typical sections or other drawings provided by outside parties	· All new river crossings will enhance bike/ped facilities more than what exists today.
4.3	Enhance or Maintain Marine Safety		· Conceptual plan and profile · Clearance constraint for high level · Clearance constraint for low level · Clearance constraint for high level · Clearance constraint for low level	· Any RC that keeps the existing bridges will score low. Keeping the existing bridges adds one more set of piers that the operators need to navigate through. · If we keep existing bridge and locate new crossing, consideration to revising the RR bridge opening will be given as a mitigation

4.4	Enhance or Maintain Aviation		· Conceptual plan and profile · Pearson airspace constraints · PDX airspace constraints	· A low profile that is downstream is the best from the viewpoint of the Pearson Airpark. · The worst condition is if you keep the existing bridges; it penetrates about 55 feet into the existing approach slope.
4.5	Provide sustained life line connectivity		· None	· All crossings will greatly improve the ability to accommodate a design seismic event. · It is assumed that if a component keeps the existing bridges they will be retrofitted to approach the same standards as for the new crossing.
4.6	Enhance I-5 incident/emergency response access within the bridge influence area.		· Conceptual typical sections	· All crossings greatly improve incident/ emergency response as they will provide full shoulder widths, better sight distances and grades.
Regional Economy; Freight Mobility				
5.1	Potential (on a qualitative scale) for component to reduce daily delay for trucks on I-5 within the bridge influence area	Can a component reduce delay for trucks?	2020 traffic model runs and estimates.	

5.2	Potential (on a qualitative scale) for component to reduce daily delay for trucks in the I-5 corridor	Can a component reduce delay for trucks?	2021 traffic model runs and estimates.	
5.3	5.3 Potential (on a qualitative scale) for component to avert extension of "no bridge lift" periods tied to I-5 congestion	Enhance or maintain efficiency of marine navigation	• Conceptual plan and profile	• Crossings that keep the existing bridge were rates as 1 because it maintains the lift period. • A crossing received a rating of 3 if it was a low level. The proposed moveable span is 65 feet at the primary channel and today it is 25 clear in closed position. We are improving the vertical clearance. Also at the alternate channel we are improving the vertical clearance. • A crossing received a rating of 5 if it was a Mid Level
5.4	5.4 Potential (on a qualitative scale) for component to increase freight vehicle throughput across the Columbia River via I-5	How many freight vehicles can a component serve?	2020 traffic model runs and estimates.	
5.6	5.6 Range of travel times (on a qualitative scale) between up to five origin/destination pairs of typical freight centers within the bridge influence area (e.g., between Port of Vancouver and Columbia Blvd. interchange)	What travel times, between key freight activity locations, does a component provide?	2020 traffic model runs and estimates.	

Stewardship of Natural Resources				
6.1	Magnitude of direct impact on designated ESA critical habitat and other threatened or endangered species habitat	What is the total acreage of critical and native habitat for T&E species within the design area footprint?	StreamNet data (from Pacific Northwest's fish and wildlife agencies and tribes) for designated Critical habitat (http://www.streamnet.org/). Johnson & O'Neil and WDFW priority habitat species and critical areas.	Will use area (acreage) and type of direct impacts to specific habitats, i.e., streams, riparian area, critical habitat, native habitats.
6.2	Magnitude of direct impact on other fish and wildlife habitat	What is the total acreage of fish and wildlife habitat within the design area footprint? What is the range of different habitat types within the design area footprint?	Metro Goal 5 Inventory. Clark County Critical Areas Ordinance data. Will assume that SOI species are present in suitable habitat. Critical and native habitat areas will be included in this criterion as well.	Will use area (acreage) and type of direct impacts to specific habitats (i.e., streams, riparian area). We will need agreement on list of species of interest (SOI) and ways to account for their habitats
6.3	Magnitude of direct impact on rare, threatened, or endangered plant species	What is the total acreage of plant habitat within the design area footprint?	Likelihood of plant presence will be based on presence of suitable habitat for rare plants. Data gathered for the PBR will provide suitable habitat. Acreage of suitable habitat will be measured.	
6.4	Magnitude and significance of direct impact on wetlands	What is the total acreage of wetlands within the design area footprint? What is the range of different wetland types within the design area footprint?	Spatial data on wetland determinations conducted for PBR. Will also use information from Metro Goal 5 and Clark County Critical Areas Ordinance. Vanport wetlands will be weighted more heavily than other wetlands.	Will still need input from regulatory agencies on significance of wetland areas that may be impacted.

6.5	Magnitude of net increase in impervious surface area	How much (square feet or acres) of additional impervious surface would be introduced by this alternative?	Use footprint data supplied by design team.	Water quality treatment options cannot be evaluated at this point.
6.7	Magnitude of direct impact to waterways	What are the removal/fill impacts to waterways?	GIS data from Metro, Clark County, City of Portland and City of Vancouver will provide surface area of water bodies. Area of in-water structure (piers) will be measured.	GIS data from local governments may be very coarse, particularly for smaller waterbodies (i.e. Burnt Bridge Creek).
Distribution of Benefits and Impacts				
7.1	Magnitude of potential residential property acquisitions in blocks or block groups with high share of low income or minority populations (compared to impacts in other blocks or block groups)	How many properties may be acquired for the design option? Do potential acquisitions cluster in areas considered high-minority or low income?	GIS parcel data and census data at the block group level. Number of units displaced within census blocs with a greater proportion of minority or low-income populations than the Portland/Vancouver MSA.	We do not know whether properties likely affected are owned my minority or low-income residents. Minority and low income populations are not uniformly distributed across census areas.

Columbia River CROSSING

Attachment G

Component Findings

Columbia River CROSSING

Component Findings

River Crossing Findings

Key Findings

Value 1 – Community Livability and Human Resources

The alternatives with no new river crossings (No-Build and TDM/TSM) would have the fewest direct adverse impacts to community resources. However, they would not address local or regional plans nor meet the project's Purpose and Need.

Of the Build Alternative Packages:

Property acquisitions in the river crossing area (from SR 14 to Marine Drive) are a function of several factors, only one of which is the river crossing option itself. Interchange designs at SR 14, Hayden Island, and Marine Drive interchanges are a major factor. River crossings would displace approximately 5 to 15 floating homes. This range varies largely on whether it includes LRT or BRT (that makes the bridge wider) and on the interchange configurations at Marine Drive and on Hayden Island. Supplemental and replacement bridges in all Build alternatives affect up to 30 commercial parcels; most of these would be partial, not full property acquisitions.

A new supplemental arterial bridge (Alternative Package 3) would have the fewest impacts to historic, archaeological, and recreational properties. Replacement bridges (Alternative Packages 8 - 12) would have the greatest historic impacts due to removing the historic, northbound I-5 bridge. However, supplemental bridges (Alternative Packages 3 - 7) would also have impacts to the historic character of the bridge because they would likely require substantial seismic upgrades. Other than the historic bridge, the impacts to historic resources would be similar for all the replacement and supplemental bridge options.

No neighborhood will be bisected by construction of a new replacement or supplemental bridge and no neighborhood will lose more than 10 percent of its total area for construction of the bridges. Upstream replacement bridges require complete acquisition of Safeway, the only grocery store on Hayden Island and a significant resource for the neighborhood. A downstream replacement bridge and supplemental interstate bridge could avoid the Safeway acquisition with some interchange options and would acquire it with other interchange options. The supplemental arterial bridge (Alternative Package 3) would avoid direct impact to Safeway. Safeway could likely be relocated on Hayden Island.

Replacement bridges and the supplemental arterial bridge all put LRT or BRT on the new bridge. This would provide more reliable service and faster travel times, thus better supporting local plans than placing LRT or BRT on the existing lift span bridge (Alternative Packages 4 and 5) or options with BRT-Lite or Express Bus only (Alternative Packages 6, 7, 11, and 12).

Value 2 – Mobility, Reliability, Accessibility

The Supplemental Interstate and Replacement Bridge alternatives result in the shortest overall travel times. These alternative packages reduce northbound I-5 travel times compared to the TDM/TSM and New Arterial alternatives by 50% or more. However, build alternatives do not improve southbound AM peak period travel times because they would carry more vehicles and would not improve capacity limitations south of the project area. A New Arterial bridge provides similar travel times as No-build and TDM/TSM.

Replacement bridges reduce transit vehicle hours of delay (VHD). Supplemental bridge alternatives place transit vehicles on the existing bridges, subjecting them to bridge lift interruptions. Bridge lifts add substantial delay – at least 17 minutes – to vehicles directly affected and cause system-wide disruption for LRT.

The Supplemental Interstate and Replacement Bridge alternatives provide the highest traffic volume throughput. The No-Build, TDM/TSM and New Arterial alternatives provide similar peak period throughput across the I-5 Bridge. The TDM/TSM and New Arterial alternatives do not accommodate I-5 Bridge travel demands, resulting in substantial congestion and increased travel times. The Supplemental Interstate alternatives accommodate about 15% to 20% higher southbound AM peak period traffic volumes and about 35% to 45% higher northbound PM peak

period traffic volumes than the TDM/TSM and New Arterial alternatives. The Replacement Bridge alternatives perform best, accommodating about 20% to 25% higher southbound AM peak period traffic volumes and about 50% to 55% higher northbound PM peak period traffic volumes than the TDM/TSM and New Arterial alternatives.

Value 3 – Modal Choice

The Replacement Bridge options and the New Arterial Bridge option perform best for Modal Choice because they would operate transit on a new fixed-span bridge, allowing transit to avoid delays and service interruptions from bridge lifts. Supplemental Interstate bridge options place transit on the existing bridges, subjecting it to bridge lifts that cause at least 17 minutes of delay to vehicles immediately affected and substantially more delay to other vehicles due to system-wide disruption (particularly for LRT). These delays not only impair travel time, but also introduce reliability problems that would make transit a less viable choice.

The Replacement and Supplemental Interstate bridge options provide the best bike and pedestrian connectivity, improving the viability of choosing these modes.

Value 4 – Safety

A replacement bridge (Alternative Packages 8 – 12) provides the greatest safety improvements because it would: provide separate facilities for bicycle and pedestrian travel; increase vehicle capacity over I-5 and provide full shoulders for incident response; eliminate bridge lifts which would alleviate both highway and marine conflicts and congestion; and, particularly for downstream replacement bridges (Alternative Packages 8, 9, and 11), reduce encroachment into the desirable clearance zone for Pearson Airpark. In addition, the replacement bridges would be constructed to current seismic standards. Overall, a replacement bridge would best enhance safety.

Using a new supplemental bridge for interstate traffic (Alternative Packages 4 – 7) would provide similar highway safety benefits as a replacement bridge except that the obstruction into Pearson Airpark's airspace would remain because the existing bridges would be reused. Also, unless the existing bridges are seismically retrofitted, they may not withstand an earthquake event.

Using a supplemental bridge for arterial traffic, and continuing to operate I-5 on the existing bridges (Alternative Package 3) would likely have a negative impact on highway safety as congestion would increase, which would also likely increase the "no bridge lift" periods and impact marine safety.

Value 5 – Regional Economy, Freight Mobility

The Replacement Bridge options provide the greatest overall benefit to the Regional Economy and Freight Mobility value. The Supplemental Interstate bridge options also perform well on most criteria, but provide much less benefit to marine navigation efficiency.

Supplemental Interstate and Replacement bridges provide the best travel times for trucks in the BIA and I-5 corridor and reduce periods of congestion over the No-Build, TDM/TSM, and New Arterial alternatives. Supplemental Interstate and Replacement bridges also provide the greatest truck throughput and provide more improvements to interchanges used to access ports, freight, and industrial facilities.

Replacement bridges (Alternative Packages 8 – 12) provide the greatest benefit to marine navigation because they eliminate the "no bridge lift" period, remove the S-curve maneuver for vessels, and increase the horizontal clearance between piers. Supplemental bridge options would likely require seismic upgrades to the existing bridge piers that would narrow the horizontal clearance between piers. The supplemental options would further increase physical obstructions in the river by adding additional piers (approximately 14 piers, versus approximately 5 with the replacement bridge options). These factors increase the size and number of piers in the navigation channel and thus adversely impact navigation operations and safety.

Value 6 – Stewardship of Natural Resources

Alternative Packages 1 and 2 (No-Build and TSM/TDM) have the least direct impact on natural resources, but they would not meet the project's Purpose and Need. They would also likely continue to discharge untreated stormwater runoff from the existing bridge into the Columbia River.

Replacement bridges (Alternative Packages 8 - 12) would perform better than supplemental bridges (Alternative Packages 3 - 7) due to smaller total footprint, greater ability to treat stormwater runoff, and fewer permanent in-water structures than supplemental bridges.

Value 7 – Distribution of Benefits and Impacts

Replacement bridge options provide the greatest equity between transit and auto users by operating both transit and auto modes on equivalent structures over the river. Supplemental bridge options that locate autos on the new, fixed span bridge, and locate high capacity transit on the existing, lift span bridge (which is subject to bridge lifts that reduce transit reliability, increase transit travel times and increase transit operation costs) could have transportation equity concerns.

The Replacement bridge options (8-12) and the Supplemental Bridge options that provide an interchange on Hayden Island (Alternative Packages 6 and 7) offer the greatest access improvements for all populations and do not appear to have notable disproportionate adverse effects.

Value 8 – Cost Effectiveness and Financial Resources

Capital cost estimates are being developed for the river crossing options.

Supplemental bridge options have much higher annual maintenance and operation costs (approximately $3 million/year) than replacement bridge options (approximately $35,000/year). This is due to higher operation costs (largely because of staffing the lift structure) and major maintenance/preservation work (such as repaving and repainting) that will be required for the existing bridges. The new, fixed span bridge would not require 24-hour staffing, and would not require any additional major preservation or maintenance improvements during the planning period (2035).

Value 9 – Growth Management/Land Use

A new bridge for LRT service (Alternative Packages 3, 8, and 9) best adheres to regional plans and policies because it provides more reliable and faster service than running LRT on the existing bridge, or providing BRT, BRT-Lite or Express Bus only. This favors replacement bridge options.

Supplemental bridges and No-Build alternatives better support the Clark County planning policy that includes historic preservation because replacement bridges remove the existing northbound bridge that is on the National Register of Historic Places.

Value 10 – Constructability

Construction impacts would be less for the New Arterial bridge compared to the other Supplemental and Replacement bridge options because it has the smallest footprint and would not require construction phasing to transfer I-5 traffic to a new bridge and interchanges. Designs are currently conceptual and therefore provide little basis or detail for distinguishing other aspects of constructability at this phase.

Transit Findings

Key Findings

Value 1 – Community Livability and Human Resources

No-Build and TSM/TDM only options (Alternative Packages 1 and 2), followed by Express Bus only (Alternative Packages 7 and 11) would have the lowest direct impact on community resources but would not meet key policies in local plans.

Of the Build Alternative Packages, Express Bus only (in Alternative Packages 7 and 12) would have the lowest direct impact because they would be contained largely within the I-5 right-of-way. However, better transit and pedestrian access to Hayden Island and downtown Vancouver afforded by LRT and BRT (in Alternative Packages 3 - 5 and 8 - 10) would provide greater potential for commercial and residential vitality and community enhancement. None of the transit options would bisect neighborhoods or affect more than 10 percent of any neighborhood.

LRT and BRT (Alternative Packages 3 - 5 and 8 - 10) necessitate widening river crossings across the Oregon Slough, displacing up to approximately 5 additional floating homes. LRT and BRT also affect up to about 30 commercial properties; most of these would be partial property acquisitions (not displacing the existing uses). BRT-Lite (Alternative Packages 6 and 11) and Express Bus only (Alternative Packages 7 and 12) impact few or no residential or commercial properties.

Alternative Packages with LRT or BRT meet local plans better than those with BRT-Lite or Express Bus only. Alternative Packages 8 and 9 appear to best meet local plans and uphold principles of multi-modalism because they provide LRT on a new fixed-span crossing that affords more reliable transit service compared to all other alternatives.

Value 2 – Mobility, Reliability, Accessibility

Overall, LRT performs best for value 2.

LRT would have the fewest transit vehicle hours of delay (VHD) during peak periods because of the exclusive guideway that continues south of the BIA. BRT-Lite would be subject to twice as much VHD as LRT. Express Bus in general purpose lanes has up to six times more transit VHD than LRT. Express bus in managed lanes performs better than in general purpose lanes, but still has twice as much VHD as LRT.

Transit mode split during the PM peak period would be 30% to 40% higher for LRT and BRT options compared to the No-Build or TDM/TSM alternatives (the mode split would be 16%, 13% and 11%, respectively). Additionally, LRT can carry at least 1.5 times more people than BRT, express bus, or BRT-Lite alone. Alternatives with both Express Bus and LRT have the highest transit carrying capacity because of the combined service. The no-build has the lowest transit mode split share, and also has a 5% to 10% higher share of single occupancy vehicles compared to the build alternatives.

Value 3 – Modal Choice

Pairing LRT and Express Bus provides the best performance overall for modal choice since this combination provides the highest access to transit markets, an exclusive guideway for transit throughout the BIA and south of the BIA, and the non-stop service of Express Bus. BRT with Express Bus provides similarly strong performance except that BRT would be delayed by I-5 traffic congestion south of the BIA. BRT-lite has relatively good transit access but would have the longest travel times because it diverts through downtown and has no exclusive guideway on I-5.

Value 4 – Safety

Transit modes that would operate on a guideway separate from vehicle traffic would help reduce conflicts and congestion on I-5. Therefore, providing LRT or BRT (Alternative Packages 3 - 5 or 8 - 9) would best enhance safety. However, introducing LRT or BRT at-grade crossings with arterial traffic in Vancouver would create potential new safety hazards.

Value 5 – Regional Economy, Freight Mobility

Transit mode options have little effect on the freight-related measures evaluated to date.

Value 6 – Stewardship of Natural Resources

LRT and BRT (Alternative Packages 3 - 5 and 8 - 10) have larger footprints which cause greater direct adverse impacts than transit options with smaller footprints such as BRT-Lite (Alternative Packages 6 and 11), Express Bus only (Alternative Packages 2, 7, and 12), and No-Build (Alternative Package 1).

LRT and BRT, as currently designed, would impact a buffer adjacent to Burnt Bridge Creek, City of Portland E-Zones, and habitat areas. However, these impacts are based on a sample alignment and could likely be reduced through design refinement. An additional consideration is that LRT and BRT are likely to increase transit mode share and better support regional growth management policies, which would lower secondary impacts to natural resources.

Value 7 – Distribution of Benefits and Impacts

LRT and BRT have higher potential to affect residential properties than BRT-Lite or Express Bus because they necessitate wider structures across the Oregon Slough, which may displace up to approximately 5 floating homes. However, residential acquisitions and displacements do not cluster in areas with notable low-income and/or minority populations.

Transit options that provide either LRT or BRT, combined with Express Bus, offer the greatest improvements in transit service to all populations. There is no notable difference in the distribution of benefits.

Value 8, Cost Efficiency and Financial Resources

Per-Mile Transit Capital Costs

	LRT	BRT	BRT-Lite	Express Bus
Low	$60 million	$25 million	$20 million	$10 million
High	$120 million	$110 million	$40 million	$30 million

The table above shows the possible range of cost per-mile of the various transit modes. LRT would run for approximately 4.5 miles, whereas the bus lines would run for 5 miles. Alternative Packages 3 and 8 combine Express Bus service with LRT. With these Alternative Packages, in addition to the capital cost requirements for LRT, express bus service would require costs for the bus vehicles and a bus maintenance facility. This would be less than simply adding the Express Bus capital costs listed in Table 1 to the LRT costs.

Annual Transit Operating Costs

	Raw Costs	Cost per transit seat
LRT + Express Bus	$10,600,000	$0.35
LRT	$8,700,000	$0.33
BRT	$13,300,000	$1.92
BRT-Lite	$17,000,000	$1.37
Express Bus	$7,000,000	$0.67

Annual operating cost per annual transit seat (a proxy for operations cost-effectiveness) varies substantially across the modes. Express bus alternatives have moderate operating costs per seat due to their AM and PM peak period operation and lower bus capacity. BRT and BRT-Lite have higher operating costs per seat, reflecting a full, all day operation between downtown Portland and Kiggins Bowl. The LRT alternatives have lower operating costs per seat due to the large train capacity and the already operating Yellow Line in Portland.

Value 9 – Growth Management/Land Use

Alternative Packages with LRT (3, 4, 8, and 9) best support regional plans and policies. BRT (Alternative Packages 5 and 10) does not satisfy regional plans calling for LRT but would support multi-modalism and compact growth.

BRT-Lite (Alternative Packages 6 and 11) is less supportive. Express Bus only options (Alternative Packages 2, 7, and 12) are the least supportive of regional plans and growth management goals.
Value 10 – Constructability
LRT and BRT (Alternative Packages 3 - 5 and 8 - 10) would have the greatest amount of construction impacts because they would have the largest footprints.

Columbia River CROSSING

Attachment H

Staff Recommendation

Columbia River CROSSING

Staff Recommendation

for the Range of Alternatives to Advance for Further Analysis in the Columbia River Crossing Draft Environmental Impact Statement

EXECUTIVE SUMMARY

The Columbia River Crossing project staff in consultation with agency partners presents this recommendation for the river crossing and transit components to advance for further analysis in the Draft Environmental Impact Statement. This proposal is intended for the Columbia River Crossing Task Force, interested stakeholders and members of the public.

The Columbia River Crossing project staff in consultation with agency partners proposes forwarding one river crossing and two transit components for further study in the Draft Environmental Impact Statement (DEIS) process:

River Crossing
Mid-level Replacement Bridge

Transit
Bus Rapid Transit (BRT) with complementary Express Bus

Transit
Light Rail Transit (LRT) with complementary Express Bus

The primary goal of the Columbia River Crossing project is to find viable solutions to improve safety, reliability and mobility on Interstate 5 across the Columbia River and between State Route 500 in Vancouver and Columbia Boulevard in Portland.

The analysis of all river crossing and transit options show the Mid-level Replacement Bridge, Bus Rapid Transit with Express Bus and Light Rail Transit with Express Bus performed better on nearly all criteria adopted by the Task Force for decision-making.

These components also meet the project's objectives as stated in the Purpose and Need Statement and Problem Definition.

For these reasons, we propose these river crossing and public transit options be advanced for further analysis during the Draft Environmental Impact Statement (DEIS) process.

We propose the following combinations of components as DEIS alternatives:

RECOMMENDATIONS

Alternative 1
No Action. This alternative is required for any DEIS process as a baseline for comparison with other alternatives.

Alternative 2
Replacement Bridge and Bus Rapid Transit (BRT) with complementary Express Bus service.

Alternative 3
Replacement Bridge and Light Rail Transit (LRT) with complementary Express Bus service.

Beginning in early 2007, additional strategies to reduce congestion and enhance safety will be added to the draft DEIS alternatives as part of a comprehensive proposal for in-depth analysis in the following year. These strategies will focus on highway, freight, bicycle and pedestrian improvements, and methods to reduce single occupant car trips and improve the flow of traffic.

RIVER CROSSING

In addition to the No Action alternative, the CRC staff proposes to advance for further analysis one river crossing option: a mid-level Replacement Bridge. When tested against other river crossing components, a replacement bridge performs better on nearly all criteria adopted for decision-making.

A Replacement Bridge would accommodate all types of travel over the Columbia River, including vehicles, freight, public transit, bicycles and pedestrians. The bridge would be built high enough to avoid the need for a lift span. It also would be designed to avoid impacts to the airspace of Pearson Air Park.

As part of the continued analysis of benefits and impacts in the upcoming year, further study is warranted to determine whether a replacement bridge should be constructed east (upstream) or west (downstream) of the existing Interstate Bridges location.

With this recommendation, CRC staff proposes to dismiss from further consideration two different Supplemental Bridge options that would retain the Interstate Bridges. The first option, "supplemental downstream arterial bridge," calls for keeping interstate traffic on the existing Interstate Bridges and constructing a new bridge for local traffic. The second, "supplemental downstream I-5 bridge," calls for a new bridge for I-5 traffic and would retain the existing bridges for local traffic, bicycles and pedestrians, and public transit.

The CRC staff recommends that the Replacement Bridge option advance for further analysis for the following reasons:

IMPROVES FLOW OF I-5 TRAFFIC

Compared to keeping interstate traffic on the existing Interstate Bridges, a new I-5 bridge would better meet the forecasted travel demands through 2030. Traffic analyses completed in summer 2006 indicate this to be the case even with the construction of a new four lane arterial bridge that also would carry light rail. While some regional and local trips would be carried by a new arterial under the "supplemental downstream arterial bridge" option, forecasts indicate that much of the arterial's capacity would remain unused and it would do little to address the over-capacity conditions on I-5.

Because traffic congestion on the existing bridges is expected to worsen even with construction of a new arterial bridge, retaining the status quo for interstate travel would not meet the project's goals, as stated in the Problem Definition and Purpose and Need Statement.

IMPROVES SAFETY

Crash rates are higher on and near the Interstate Bridges than other comparable urban freeways in Washington and Oregon due to bridge design, bridge lifts, number of vehicles traveling and vehicle speed. Narrow one-foot shoulders do not allow disabled vehicles to pull off the highway safely and the "hump" in the middle of the bridges does not provide sufficient line of sight for vehicles traveling more than about 35 mph.

Retaining the status quo for safety would not meet the project's goals, as stated in the Problem Definition and Purpose and Need Statement. As a result, the "supplemental downstream arterial bridge" option, which calls for continued use of the existing bridges for I-5 traffic, is not recommended to advance.

ELIMINATES NEED FOR SEISMIC UPGRADES

A Replacement Bridge would be built to current seismic standards to withstand a significant earthquake and continue to serve the transportation needs of the region during recovery.

The existing Interstate Bridges do not meet earthquake standards and would likely need to be upgraded if the structures were used for any transportation purpose, including interstate travel, arterial travel, public transit and paths for bicyclists and pedestrians. In August 2006, a panel of seismic experts determined the structure would potentially collapse during a significant earthquake because the soils holding many of the bridge's wooden piers would liquefy. The panel also reported that the structure could be retrofitted to partially meet current earthquake standards (i.e., it could be designed to avoid collapse). However, even with a seismic upgrade to prevent collapse the structure could be rendered unusable after a significant earthquake. A seismic upgrade would require reinforcing each of the piers with a concrete encasement and nearly completely rebuilding the lift structure. Pier encasements would increase the diameter of each pier by 10 to 40 feet, which would reduce the space between piers for marine traffic.

LOWER COSTS

The existing bridges are expensive to maintain and operate in comparison to a Replacement Bridge because of their age, need for bridge lifts, and characteristics of the structures. In addition to current annual operation, maintenance, and capital costs of about $3 million per year, seismically upgrading the bridges could cost between $125 and $265 million.

The existing bridges could accommodate both high capacity transit options under consideration: either light rail or bus rapid transit. However, light rail would require costly upgrades to the bridges for placement of tracks and power.

REDUCES LAND NEEDS

Adverse land use and right-of-way impacts are generally greater for options that reuse the existing bridges because of the need for parallel connections at each end of the structures. This is especially true on Hayden Island where some of the Supplemental Bridge options require an interchange design with a much larger footprint, nearly doubling the permanent property required for the widened I-5 freeway corridor and its interchanges, as well as the right-of-way needed for the existing bridges being used as an arterial. As a result, business and private property displacements would increase with the Supplemental Bridge options.

FEWER IMPACTS TO LOCAL STREETS

The Supplemental Bridge options provide a local arterial connection between downtown Vancouver and Hayden Island. All of the options would cause an increase in congestion in downtown Vancouver and Hayden Island compared to the Replacement Bridge options due to traffic diversion to local streets that would result from congestion on I-5, especially for the Supplemental Arterial option. Other traffic impacts would result from routing Clark County trips to Hayden Island through downtown Vancouver.

In addition, congestion and queueing would result from bridge lifts. The U.S. Coast Guard has said lifts could occur at any time of the day if the existing bridges are not used for interstate traffic. Currently, bridge lifts are restricted from 6:30 to 9 a.m. during the morning peak period and 2:30 to 6 p.m. during the afternoon peak period. A change to frequent bridge lifts would result in increased arterial congestion in downtown Vancouver and on Hayden Island and the vicinity of Marine Drive in Portland.

IMPROVES RIVER NAVIGATION

River navigation problems would worsen from current conditions under the Supplemental Bridge options because nearly three times more bridge piers would be placed in the water creating more navigational hazards. In addition, the piers associated with the existing bridges would be widened as part of the seismic upgrade, further restricting the river navigation channels.

The U.S. Coast Guard currently recognizes this stretch of the Columbia River as one of the more difficult areas to navigate because of currents and the challenges associated with weaving through the Interstate Bridges and the railroad bridge one mile downstream. River navigation would be improved under the Replacement Bridge options because the marine channel alignment would be improved with fewer piers and the need for bridge lifts would be removed.

GREATER RELIABILITY FOR TRANSIT SERVICE

The existing bridges would continue to be affected by bridge lifts. For that reason, a Replacement Bridge provides for more reliable transit service compared to the Supplemental Bridge options that place light rail or bus rapid transit on the existing bridges. Bridge lifts that could occur any time during the day would disrupt transit service throughout the entire transit system.

PROJECT BACKGROUND AND TIMELINE

FALL 2005

Defining the Problems and Potential Solutions

The Columbia River Crossing project staff reviewed data developed by the I-5 Transportation and Trade Partnership and worked with the public, tribal governments and partner agencies to define the primary problems in the project area, which included congestion, dangerous travel conditions and travel demand that exceeds capacity. The staff then used a public process to brainstorm potential solutions and ideas to address the problems. The staff worked with the project's advisory Task Force to develop criteria based on regulatory requirements and community values and concerns to evaluate the potential solutions and ideas.

SPRING 2006

Narrowing the Ideas

Through discussions with the Task Force and community, the CRC project staff studied the options proposed for improving the river crossing and public transportation. A set of 23 initial river crossing ideas was eventually reduced to four and a set of 14 initial public transportation ideas was reduced to five over a series of months.

SPRING – SUMMER 2006

Testing the Preliminary Alternatives

A dozen preliminary alternative packages were generated by combining options under consideration for the purpose of testing and analysis. Each preliminary alternative was composed of components or parts that make up a comprehensive transportation system to address the safe and efficient movement of people and goods between Oregon and Washington. River crossing, highway, transit, freight, bicycle and pedestrian improvements and strategies to reduce travel demand are the components that comprised the alternatives. River crossing and transit components serve as the fundamental elements for analysis of improvements to the I-5 corridor.

The 12 preliminary alternative packages were tested against the evaluation criteria to highlight the strengths and weaknesses of individual components and the best performing combinations. The analysis incorporated community, cost, land use, environmental, environmental justice, and seismic concerns.

Results from this work are now available.

FALL 2006

Identifying Best Performing Components for the Draft Environmental Impact Statement

Columbia River Crossing project staff in collaboration with partner agencies have proposed the best performing river crossing and transit components move forward for further evaluation in the Draft Environmental Impact Statement (DEIS). These best performing river crossing and transit components have been repackaged into three draft DEIS alternatives as part of the proposal. Beginning in early 2007, other components that will incorporate highway, freight, bicycle and pedestrian improvements, and strategies to reduce travel demand will be added to the draft DEIS alternatives for further in depth analysis. The next step is for the Task Force and the community to provide feedback on the recommendations.

This would affect transit reliability, travel times, and ridership beyond just the project area. Each bridge lift during peak periods would back up at least three to four trains or buses at each end of the bridges during peak periods, delaying riders and severely impacting operations north and south of the Columbia River. Today, following a bridge lift, it can take up to an hour to restore highway and transit operations to pre-lift conditions.

Bridge lifts would make high capacity transit service on the existing bridges inferior and more costly compared to operating transit on a new bridge. This raises transportation equity concerns for those options where auto users would be on a new, fixed span bridge and transit users would be on the older, lift span bridge that would be subject to peak period interruptions, decreased reliability, longer travel times and higher operation and maintenance costs. Thus, it would be imprudent to subject a high capacity transit system to frequent and disruptive bridge-lift impacts.

COMMITTED BRIDGE OWNERSHIP

With a Replacement Bridge for I-5 traffic, the Oregon and Washington transportation departments would continue to own, operate and maintain a new bridge similar to the current situation with the Interstate Bridges.

For the Supplemental Bridge options, the functions served by the existing bridges would change to either carrying local arterial traffic or transit. As transportation system uses convert from Interstate to local functions, they move outside of the purview of the DOTs; as such, neither DOT has an interest in owning and operating facilities that function as city or county facilities. If no alternative owner can be found, the U.S. Coast Guard would require the bridges to be removed. To date, no other entity has expressed interest in owning and operating the existing Interstate Bridges.

FEWER IMPACTS TO NATURAL RESOURCES

Long term natural resource impacts are greater for Supplemental Bridge options versus Replacement Bridge options.

An analysis of the Supplemental Bridge options found they would:

- Have more total impervious surface with 10 – 20 percent more deck area, which would increase the amount of pollutants entering the water;
- Place more piers in the water with about 14 compared to five, which would disrupt fish passage routes and provide greater habitat for predators; and
- Be less conducive to reducing pollutants in storm water runoff.

These differences all would result in greater adverse impacts to water quality, salmon and other aquatic resources.

In addition, the bridge lifts that would occur with the Supplemental Bridge options would cause more local traffic congestion and would back up light rail or bus rapid transit vehicles attempting to cross the existing bridges. These transportation impacts would result in higher air quality impacts near the river crossing and higher energy consumption, compared to locating all traffic and transit operations on a new fixed span bridge.

REQUIREMENTS RELATED TO LISTING ON THE NATIONAL REGISTER OF HISTORIC PLACES

The existing I-5 northbound bridge is listed on the National Register of Historic Places and is therefore subject to special protection under Section 4(f) of the U.S. Department of Transportation Act. This federal law prohibits the USDOT (which includes the Federal Highway Administration and Federal Transit Administration) from funding any project that would have an adverse impact on significant historic resources unless it can be demonstrated that there are no "prudent and feasible" alternatives that would avoid the impact.

The lead federal agencies (FHWA and FTA) have the authority to determine whether the avoidance alternatives are "prudent and feasible." The CRC team is confident that the accumulation of factors (identified above) will satisfy the Section 4(f) requirements and have requested the federal lead agencies to provide their legal opinion on the prudence and feasibility of removing the existing bridges. The federal agency opinion will be requested in early 2007.

Formal Section 4(f) analysis and documentation will be completed as part of the NEPA documentation, scheduled for completion in 2008. Required steps would include photographic records and other documentation of the historic elements and nature of the 1917 bridge.

A Short History of the Interstate Bridge

The Interstate Bridge is really two adjacent bridges, the first of which was built in 1917 and today carries northbound I-5 traffic. The first bridge was designed when horses shared traffic with automobiles. With a posted speed limit of 15 mph, most motor vehicles crossing the bridge were Model T Fords powered by a 20 HP engine and top speeds of 45 mph. The companion southbound bridge, opened in 1958, was built to match the 1917 bridge and has similar design features that limit operations and safety under current regional traffic use.

In 1960, 30,000 vehicles crossed the I-5 bridges each day. In 2006, in excess of 130,000 vehicles cross daily, resulting in demand that exceeds capacity during extended morning and evening peak periods. By 2030, it is forecast that about 180,000 vehicles will cross the I-5 bridges each day. Over time, each bridges original two lanes were narrowed and repainted to increase capacity by providing three lanes in each direction. This action left no room for shoulders to accommodate vehicle breakdown and recovery or emergency response. At the same time, modern cars, trucks, and buses now are bigger and faster and require roadway design features that are built to current standards to accomodate safer operations.

TRANSIT

In addition to the No Action alternative, the Columbia River Crossing project team proposes to advance two transit options for further analysis in the process to develop a Draft Environmental Impact Statement:

- Bus Rapid Transit with complementary Express Bus service on I-5 (BRT)
- Light Rail Transit with complementary Express Bus service on I-5 (LRT)

Bus Rapid Transit is a high capacity transit option that incorporates many features commonly associated with light rail. The vehicles may operate either in a roadway separate from the other traffic or in general purpose lanes.

Express Bus service has been combined with both Bus Rapid Transit and Light Rail to better serve transit needs in and beyond the project area. Express Bus service would serve long distance commuter markets by providing direct access to and from Clark County to downtown Portland during morning and evening peak commute hours.

Light Rail is a high capacity transit option that operates in its own right of way, which helps to ensure a fast and reliable transit time. LRT vehicles are typically much larger than buses, thus providing an enhanced capacity for riders.

There were five transit options analyzed by the Columbia River Crossing project team in mid-2006.

- Express Bus service in I-5 general purpose lanes
- Express Bus service in I-5 managed lanes
- Bus Rapid Transit Lite
- Bus Rapid Transit (BRT)
- Light Rail Transit (LRT)

This recommendation would effectively combine the two BRT options with the aim of taking the best aspects of each to create an optimal BRT proposal for the DEIS. In addition, the Express Bus options, with this proposal, would be dropped from further study as stand alone public transportation solution.

The best performing features of Express Bus service in I-5 general purpose lanes and Express Bus service in I-5 managed lanes would be combined with existing local bus service and paired with BRT and Light Rail.

The CRC project team proposes to advance the Bus Rapid Transit and Light Rail options for further refinement and evaluation during the Draft Environmental Impact Statement process for the following reasons:

BUS RAPID TRANSIT (BRT) WITH COMPLEMENTARY EXPRESS BUS SERVICE ON I-5

Reduces Congestion on I-5

Bus Rapid Transit would increase transit use while reducing the number of buses on the highway. Buses would connect directly to the existing TriMet Yellow Line MAX. This option takes advantage of the existing high capacity transit system instead of traveling on I-5 to and from downtown Portland during morning and evening peak commute hours. Bus Rapid Transit holds

promise for significantly increasing transit use. However, because the BRT system evaluated used I-5 general purpose lanes south of Delta Park, it would experience additional delays from freeway incidents and congestion.

Meets Current and Forecasted Transit Demand for the Year 2030

Extensive data gathering, public review, and forecasting projections conducted by the CRC project staff indicate public transit must be reliable, fast, and frequent. The diversity of transit needs in the project area and the Vancouver-Portland metropolitan area cannot be served by one form of transit alone. To effectively serve current and forecasted travel demand in the year 2030, transit components must be combined.

The Bus Rapid Transit option would meet the test of fast and frequent service, but would experience additional travel delays south of Delta Park, thus degrading future reliability. Schedules would be coordinated with existing transit on both sides of the Columbia River; it would connect to an existing high capacity transit system; and in combination with Express Bus service would provide for long distance commuters to connect directly to downtown Portland. Because BRT would work in conjunction with existing transit, it also provides a high capacity transit alternative at a somewhat lower capital cost (when compared to light rail). As part of the continued analysis of benefits and impacts, the project team will refine the capital cost estimates and conduct continued analysis to determine the most optimal Bus Rapid Transit operating plan.

Addresses Public Transit Issues Identified in Project Purpose and Need Statement

The five transit options considered in 2006 were evaluated to determine how well each addressed these transit issues identified in the CRC project's Purpose and Need Statement: markets, reliability, operations and connectivity.

BRT addresses the four transit issues because this option would be part of an integrated transit system connecting transit providers and transit users on both sides of the Columbia River. It would be capable of serving the inner urban core, and when coupled with express bus service would serve suburban long distance transit markets. The option would further enhance transit operations by working in conjunction with existing transit.

Lessons Learned

The analysis of BRT alternatives provided several lessons to help refine the BRT alternative recommended to be carried forward. Some of the key lessons learned include:

- Operating BRT to downtown Portland on I-5 general purpose lanes incurs a large operating expense while subjecting BRT to additional delays due to incidents and congestion.
- In lieu of operating BRT to downtown Portland, the future service should connect directly to the Interstate MAX line, avoiding travel on I-5 south of Delta Park.
- To achieve the capacities needed to serve projected market share, BRT frequencies would need to be relatively higher than LRT. Further study will be needed to optimize the number and frequency of buses operating in downtown Vancouver and Hayden Island.
- Further study will be needed to optimize alignment and station locations.

LIGHT RAIL TRANSIT (LRT) WITH COMPLEMENTARY EXPRESS BUS SERVICE ON I-5

Reduces Congestion on I-5

Light Rail would extend TriMet's Yellow Line MAX service from the Expo Center to Hayden Island and across the Columbia River to downtown Vancouver. This option takes advantage of the existing TriMet Light Rail infrastructure already built and operating from Expo Center to downtown Portland, Portland International Airport (PDX), east Multnomah County and Washington County and under construction to Clackamas County.

Light Rail would provide transit that better connects residents within the project area to employment, cultural, educational, health and recreational centers in the region. Operating on a dedicated guide-way separate from vehicle traffic would ensure reliability and consistency of travel times, while also helping to reduce roadway conflicts and congestion on I-5 general purpose lanes.

Meets Current and Forecasted Transit Demand for the Year 2030

Of all the transit alternatives considered, Light Rail features the highest passenger capacity and would accommodate the projected transit demand of the year 2030. Fast, frequent and reliable service have been identified through surveys and analysis conducted by the CRC project team as the most important features of public transit. Light Rail has an established high degree of travel time reliability that will continue into the future. Complementary Express Bus service will enhance this attribute.

Extension of the existing Light Rail system has a relatively high capital cost, but the lowest incremental operating cost of any of the high capacity transit options analyzed. Because travel demand will increase, Light Rail's low operating cost is also a factor that contributes to the recommendation to move this option forward for further analysis.

Addresses Public Transit Issues Identified in Project Purpose and Need

Light Rail was evaluated during 2006 to determine how well the option addressed the transit issues identified in the CRC project's Purpose and Need Statement: markets, reliability, operations and connectivity.

Light Rail is a specific recommendation outlined in the I-5 Transportation and Trade Partnership Strategic Plan. Combined with complementary Express Bus service, Light Rail addresses the issues identified in the Columbia River Crossing project's Purpose and Need Statement. Transit markets would have the most access to the region's future employment centers. Light Rail with complementary Express Bus service

on I-5 also would offer greater support to development and redevelopment in the City of Vancouver than other alternatives. The system would benefit from the demonstrated reliability of Light Rail. The option would further enhance transit reliability and operation efficiency because it works in conjunction with existing transit systems.

Lessons Learned

The analysis of LRT alternatives provided several lessons to help refine the LRT alternative recommended to be carried forward. Some of the key lessons learned include:

- LRT has the highest degree of travel time reliability now and in the future. LRT also has the highest passenger capacity of any transit mode evaluated to date.
- LRT operating costs are lower than BRT due to the existing and funded Interstate MAX line to the Expo Station. LRT operations need to be refined so that frequencies match the forecasted transit market demand.
- LRT park-and-ride capacities need to be optimized to accommodate the forecasted demand from both the inner urban and suburban commuter markets.
- Further study will be needed to optimize alignment and station locations.

Alternatives Recommended for the DEIS

Building on the proposals detailed above, the CRC project team further recommends three alternatives be evaluated during the DEIS process. When completed, the alternatives will include a comprehensive set of strategies to address all aspects of traffic congestion and highway safety identified into projects' problem definition and purpose and need. At this time, the CRC team is forwarding only the river crossing and transit proposals as the defining elements for future decision-making. The following alternatives are proposed:

ALTERNATIVE 1: NO ACTION

Under the National Environmental Policy Act (NEPA), one of the alternatives considered must be a no-action alternative. Although this alternative does not meet the project Purpose and Need, it establishes a baseline for comparison with other alternatives. It will include only existing facilities and services, as well as projects that can be reasonably anticipated for funding and construction in the Metro and Southwest Washington regional transportation plans.

ALTERNATIVE 2: I-5 REPLACEMENT BRIDGE WITH BUS RAPID TRANSIT (BRT)

River Crossing Features

This alternative includes construction of a new I-5 replacement bridge. It would be built as a mid-level span to comply with vertical clearance requirements

WHAT IS A DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)?

The National Environmental Policy Act (NEPA) is a federal law that regulates the decision-making processes of federally funded projects. The purpose of NEPA is to help ensure that public projects address the needs of the community while avoiding or minimizing negative impacts on human and natural environments.

For any project that might have significant impact on its environment, NEPA requires the development of a Draft Environmental Impact Statement. The DEIS is a summary of the expected impacts each project design, or "alternative," is likely to have on the surrounding area. Developing a DEIS requires an intense and thorough process of analysis for each proposed alternative.

After completion, the DEIS becomes the subject of one or several public hearings. Through integrating comments from these hearings into the DEIS along with other process elements, project sponsors then create a Final Environmental Impact Statement. As part of this process, they also identify a "locally preferred alternative" to signify the decision of a single project alternative to move forward into funding and construction.

above the Columbia River and clearance requirements below Pearson Airpark airspace. The mid-level height allows the bridge to be a fixed-span structure with no bridge lifts. The new bridge could be built either upstream or downstream of the existing I-5 bridges, which would be removed once the new bridge could accommodate traffic. The new bridge would carry I-5 traffic in general purpose lanes and potentially in managed lanes, high capacity transit, express bus and bicycles and pedestrians.

Transit Features

This alternative focuses on BRT as the high capacity transit mode crossing the river. It is the consolidation of the best performing elements of BRT, BRT-Lite, and local bus infrastructure and service within the project area, combined with complementary express bus service on I-5. The BRT service would not run buses to downtown Portland, but would instead involve a transfer to the TriMet LRT Yellow Line MAX for continuation to downtown Portland.

ALTERNATIVE 3: I-5 REPLACEMENT BRIDGE WITH LIGHT RAIL TRANSIT (LRT)

River Crossing Features

Same as Alternative 2.

Transit Features

Light rail would serve as the high capacity transit mode for Alternative 3 and involve a double-track extension from the Exposition Center LRT Station in Portland to a park and ride terminus near downtown Vancouver. Exact transit alignment(s), termini, and supportive park-and-ride facilities will be refined during the DEIS. Complementary express bus service on I-5 also would be part of this alternative.

Other Outstanding Issues to be Addressed

Several outstanding issues will require further refinement and testing leading up to and during the DEIS. The CRC project team will test many of these issues before launching the DEIS process in spring 2007 to narrow the number of outstanding issues and better define the DEIS alternatives. Decisions on these issues will be informed by public feedback and input beginning in December 2006.

High Capacity Transit Alignment and Station Area Refinement

During the screening process to-date, light rail and bus rapid transit were evaluated in the same representative alignment. To complete the DEIS, other alignments for each mode will be evaluated. A short list of alignments, as well as station locations and park and ride facility capacities and locations will be refined for the DEIS analysis.

Roadways North and South Features

Any new Replacement Bridge would include improvements both north and south of the river. These could consist of potential I-5 interchange reconfigurations, arterial street improvements, and I-5 safety improvements within the project area. At some interchange locations, such as Hayden Island, more than one feasible design option may be advanced for evaluation. During the DEIS process, the most appropriate interchange options for safe and efficient operations will be paired with river crossing and transit modes.

Bicycle/Pedestrian Features

Any new replacement bridge would accommodate a multi-use path(s) for bicyclists and pedestrians. Improved connections to Hayden Island, downtown Vancouver, and North Portland would be provided.

Freight Features

As recognized by the CRC Freight Working Group, freight vehicles would gain the greatest benefits from increased mobility on I-5 and arterial street improvements through capacity and safety improvements. Additionally, the Alternative 2 and Alternative 3 proposals, where appropriate and feasible, could integrate one or more of the following freight features that remain under consideration:

- Freight bypass lanes in congested locations where trucks have difficulty merging on and off I-5;
- Freight direct access ramps at key regional freight accesses to/from I-5;
- Enhanced design of highway ramps and interchanges for freight mobility

TDM/TSM Measures

Transportation demand management (TDM) promotes programs that are designed to maximize the people-moving capability of the transportation system by shifting travel to non-automobile modes, increasing the number of persons in vehicles, and influencing the time of, or need to, travel. Transportation system management (TSM) programs tend to be traffic operation-oriented activities implemented by public transportation agencies, and include such measures as improved traffic signal timing, enhanced traveler information, the addition of auxiliary lanes at congested intersections, signing and marking improvements, parking restrictions, one-way street systems, and ramp meter by-pass lanes.

Alone, TDM/TSM measures will not satisfy the range of transportation issues identified along I-5 within the project area. This conclusion was reached during the I-5 Transportation and Trade Partnership, and confirmed by more recent modeling and analysis.

Many TDM/TSM measures have the potential to help reduce travel demand and improve operational performance in the project area. Incorporation of a TDM/TSM program into the DEIS alternatives will serve as part of a larger multi-modal solution. The "build" alternatives carried forward into the DEIS process will incorporate the most appropriate and potentially effective TDM/TSM measures as part of a multi-modal solution.

Managed Lanes

A single managed lane in each direction along I-5 will be tested on the new I-5 replacement bridge and within the project area to support express bus service that complements the light rail and bus rapid transit options. The managed lane system to be tested assumes that I-5 would be re-striped wherever possible to add a managed lane between 139th Street in Clark County and approximately Alberta Street (for northbound I-5) or Victory Boulevard (for southbound I-5) in Portland. The managed lane system would include preferential managed lane merges north and south and would include selected ramp queue jumps for transit vehicles where ramp meters operate. The CRC project team will test managed lane performance to help refine the range of variables needing further evaluation in the DEIS.

Tolling

Early review of funding and financing options for this project suggest that tolling will be required to fund any new Columbia River Crossing. As such, additional work is needed to refine and test various tolling structures and assess how tolling influences at least the following three issues: 1. revenue generation, 2. congestion management, and 3. facility design.

Replacement Bridge Structure Type, Alignment, and Appearance

The Replacement Bridge proposal could include an alignment upstream (east) of the existing bridges or downstream (west). The vertical alignment of both upstream and downstream options will be constrained by clearance requirements above the Columbia River and by clearance requirements below Pearson Airpark airspace. These constraints limit the range of potential bridge structure types that could be employed.

The appearance, aesthetic qualities, and costs of potential bridge structure types will be evaluated during the DEIS process. The CRC project team is developing an Architectural Guidelines and Aesthetic Assessment Framework to engage the public and project stakeholders in a dialogue around these issues.

NEXT STEPS TO REACH A RECOMMENDATION OF THE DEIS RANGE OF ALTERNATIVES

With this document, the CRC project team has issued its proposed range of alternatives to advance into the DEIS. Over the next three months, the project team will conduct a series of meetings with project stakeholder groups and the public to obtain input on this recommendation.

The CRC Task Force will discuss the proposal at its December 13, 2006 meeting. Task Force comments and recommendations from that meeting will be included in the materials presented to the public for consideration. In January 2007, a series of public and agency outreach events will occur to gain feedback on the proposal. The Task Force is scheduled to consider public feedback during its February 2007 meeting and make a final recommendation on the DEIS range of alternatives.

Columbia River CROSSING

Sponsored by the Oregon Department of Transportation and the Washington State Department of Transportation.

Americans with Disabilities Act (ADA) Information: Individuals requiring reasonable accommodations may request written material in alternative formats by calling the Columbia River Crossing Project Office (360-737-2726 or 503-256-2726). For individual needs in Oregon call the Oregon Department of Transportation (503-986-3700). For individuals who are deaf or hard of hearing call the Washington State TTY (1-800-833-6388) or the Oregon State TTY (1-800-735-2900).

Title VI: The project ensures full compliance with Title VI of the Civil Rights Act of 1964 by prohibiting discrimination against any person on the basis of race, color, national origin or sex in the provision of benefits and services resulting from its federally assisted programs and activities. For questions regarding the Title VI Program, you may contact WSDOT's Title VI Coordinator at 360-705-7098.

MORE INFORMATION

Web www.ColumbiaRiverCrossing.org
Phone 866-396-2726 (toll-free)

SUBMIT A COMMENT

Comments and questions about the Columbia River Crossing project may be submitted at any time through the following channels:

E-Mail feedback@columbiarivercrossing.org
Mail 700 Washington St., Suite 300
Vancouver, WA 98660
Fax 360-737-0294
Phone 866-396-2726 (toll-free)

Columbia River CROSSING

Attachment I

Fourth Alternative Subcommittee Recommendation

Columbia River CROSSING

Memorandum

March 26, 2007

TO: Hal Dengerink and Henry Hewitt, Co-Chairs

FROM: Fourth Alternative Subcommittee (Prepared by CRC Staff)

SUBJECT: Fourth CRC DEIS Alternative Recommendation

COPY: Doug Ficco, WSDOT and John Osborn, ODOT – Co-Directors

ATTACHMENTS: Fourth Alternative Progression Diagram
Fourth Alternative Subcommittee Recommendation

BACKGROUND

At the February 27, 2007 Task Force meeting, a subcommittee was formed to develop a potential fourth alternative for analysis in the CRC project's DEIS. The subcommittee included the following members:

Metro Councilor Rex Burkholder, Co-Chair
Clark County Commissioner Steve Stuart, Co-Chair
Hal Dengerink, CRC Task Force Co-Chair, ex-officio subcommittee member
Henry Hewitt, CRC Task Force Co-Chair, ex-officio subcommittee member
Dean Lookingbill, SW Washington Regional Transportation Council
Fred Hansen, TriMet
Jeff Hamm, C-TRAN
Walter Valenta, Bridgeton Neighborhood
Scot Walstra, Greater Vancouver Chamber of Commerce
Tom Zelenka, Schnitzer Group

Meetings were held weekly at the former Hayden Island Yacht Club, 12050 N. Jantzen Drive, Portland, Oregon. Meeting dates and times were:

March 12, 2007, 2:30 p.m. to 4:30 p.m.
March 19, 2007, 8:00 a.m. to 9:00 a.m.
March 26, 2007, 8:00 a.m. to 10:00 a.m.

The following ground rules were adopted at the initial March 12th meeting:

Ground Rules for Developing the Fourth Alternative:

1. We will produce an alternative in three weeks.
2. The alternative will aspire to meet the CRC project's Purpose and Need Statement.
3. Our job is to assemble the best possible solutions that do the following:
    a. Maximize the utility of the existing bridges
    b. Provides High Capacity Transit (HCT) between Clark and Multnomah counties
    c. Provides high quality bicycle and pedestrian access
    d. Minimizes impacts on downtown Vancouver and Hayden Island
    e. Ensure better freight mobility
    f. Address issues of barge and ship traffic on the Columbia River
4. The Task Force members named by the chairs will be the members of the subcommittee unless the co-chairs (Commissioner Stuart and Councilor Burkholder) and the CRC Task Force co-chairs decide more expertise is needed.

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5. While subcommittee meetings will be noticed and will be open to the public, only officially designated members will participate. Given that the recommendation on including any proposed alternative will be made by the CRC Task Force, the subcommittee will not take any public testimony.
6. Our goal is to make decisions by consensus.

Evaluation Criteria for the Fourth Alternative

The subcommittee recommended the performance of the fourth alternative should aspire to achieve the following criteria in accordance with the CRC project's Purpose and Need:

- encouraging mode shift
- moving people and freight
- optimizing interchanges
- using existing bridges most effectively
- minimizing impacts to land use, minimizing footprints
- providing a lower cost alternative

PROCESS

For the initial meeting, CRC presented two "book-end" options for review by the committee. Option A was essentially a "No-Build" for I-5 with TDM/TSM and transit service. Option B added six lanes of new capacity for I-5, three in each direction, and used the existing bridges for auxiliary lanes in addition to transit service. Both alternatives addressed appropriate interchange modifications, safety improvements, TDM/TSM, freight enhancements, bicycle/pedestrian upgrades, seismic retrofits, and relocation of the railroad moveable span.

For the March 19, 2007 meeting, CRC staff was asked to provide conceptual layouts for three modifications to Options A and B along with an evaluation of their performance sufficient to begin shaping the proposed fourth alternative. The following three recommendations were optimized and evaluated by CRC staff:

- Option A+: Essentially a No-Build option for I-5 with aggressive TDM and Transit components to meet the demand to move people across the river, including a new HCT bridge across the river. I-5 improvements were targeted at improving safety and system flow.
- Option A++: The same as Option A+ with the addition of two I-5 auxiliary lanes, one in each direction, on a new bridge combined with HCT.
- Option B-: Uses the existing I-5 Bridges as auxiliary lanes and provides for two new I-5 lanes in each direction on a new bridge to carry through traffic and HCT. Appropriately sized TDM strategies and increased transit service is added to balance the demand.

Upon presentation of the performance results of the three options, CRC staff was asked to evaluate an additional option that fell somewhere between Option A++ and Option B-. CRC staff added another option for review at the March 26th meeting. These two options are described below:

- Option A++ Modified: This option uses the existing Interstate Bridges for I-5 traffic and adds two lanes, one in each direction, on a new bridge with HCT. Pricing or tolling may be used on the new or existing lanes to reduce vehicle demand. Transit service is increased sufficiently to encourage options to driving alone. A new moveable span is provided on the railroad crossing that best serves navigation needs.
- Option B- Modified: CRC staff recommended an option that uses the existing bridges for NB traffic and a new bridge for SB traffic. The total number of lanes can be limited to eight, two lanes each on the existing bridges and four lanes on the new bridge. This option has the same number of I-5 lanes as Option A++ Modified described above, but more effectively and efficiently uses existing infrastructure and alignments. SB lanes can transition directly to the new alignment without the need for additional shoulders and the fly-over. TDM and Transit is

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similar to Option A++ Modified. HCT can share the SB highway bridge. This option also improves opportunities to toll all vehicles crossing the Columbia River.

At the March 26, 2007 subcommittee meeting, Option B- Modified was recommended as the fourth alternative for presentation to the Task Force at their March 27, 2007 meeting.

Following is a detailed description of the Fourth Alternative subcommittee recommendation:

FOURTH ALTERNATIVE SUBCOMMITTEE RECOMMENDATION

A total of eight I-5 lanes will be provided, four in each direction. The existing Interstate Bridges will carry northbound traffic and will be modified to carry two lanes on each bridge. The existing southbound bridge will be converted to northbound for two general purpose through lanes. The existing northbound bridge will carry two lanes, one for general purpose and the other as an auxiliary lane. Four I-5 southbound lanes will be provided on a new bridge with HCT, three general purpose lanes and one auxiliary lane. HCT lanes can either be for light rail or express bus. Transit service will be sized to meet increase demand for riders. Tolling will be used for project funding and will also reduce travel demand. Other TDM as well as TSM and freight enhancements will be included. Bicycles and pedestrians will be on a wider, retrofitted path on the existing bridges. Interchange modifications will be included in relationship to the mainline I-5 improvements to assure the best operational characteristics. A seismic upgrade of the existing bridges may be required. A new railroad moveable span may be required to benefit navigation.

Component improvements recommended include:

Highway

- The existing I-5 bridges are re-striped to provide two lanes on each bridge and allows for an outside safety shoulder for disabled vehicles. The two lanes on the NB bridge will connect with the interchanges as well as allow for through traffic. The two lanes on the SB bridge will become through NB lanes.
- Four new SB I-5 lanes are provided on a new bridge along with HCT. The new lanes will allow for three through lanes and one auxiliary lane connecting SR 14 with Hayden Island.
- Interchanges are modified to improve intersection performance in accordance with operational analysis that balances the mainline improvements. Spot safety improvements are included.
- Traffic system management tools are incorporated to improve I-5 operations.

Transit

- A new river crossing bridge for HCT is included with the new highway bridge.
- HCT capacity is increased to serve approximately 25,000 persons per day.
- Express bus service and local and feeder bus service are increased to serve the added transit capacity. Increase in transit service is based on data generated from model runs and confirmed by the transit providers.
- Park-and-ride lot capacity is increased from the existing 1,872 spaces in the I-5 corridor to approximately 7,500. Recommendations for reduction in park-and-ride spaces can be achieved based on modeling results and transit service recommendations.

TDM/TSM

- Tolling is included for both the new I-5 bridge and existing bridges with variable pricing to reflect peak hour demand. Pricing is focused on generating revenue to help fund the new improvements as well as reducing demand.
- Transit operating subsidies are provided to encourage increased transit service and use.

Freight Mobility

- Trucks have the opportunity to use the new I-5 capacity.

- Spot modifications at key intersections improve truck flow in the interchanges.
- Rebuilding the SB lanes allows ramp by-pass lanes for transit and trucks.

Bicycle/Pedestrian

- Bicycle and pedestrian traffic will use the existing Interstate Bridges. Existing facilities will be widened either on the east side only to provide for a 15 foot-wide path or 10 feet on each side of the two bridges for two paths.
- Bicycle and pedestrian connections are improved throughout the corridor.

Seismic

- Seismic retrofit to "no-collapse" standards would most likely be required for this option.

Railroad Swing Span

- A new railroad marine navigation moveable span is constructed to align with primary navigation needs.

It is important to note that the description of components for the fourth alternative is much more detailed than CRC staff recommendations for the replacement bridge. All alternatives carried into the DEIS will undergo operational analysis to assure best performing elements are included and transit and interchange improvements will be carried forward that are cost-beneficial and sized to meet 2035 demand as required by FHWA and FTA.