
Tier II Report
SR-35 Columbia River Crossing Feasibility Study

Prepared for

Southwest Washington Regional Transportation Council
Oregon Department of Transportation
Washington State Department of Transportation

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EXECUTIVE SUMMARY

The SR-35 Columbia River Crossing Feasibility Study is being conducted in response to local business and resident concerns about the safety and service life of the existing Hood River Bridge. The project began in 1999, with the plan for a feasibility study to determine if there was a need to replace the bridge and whether there was community support for a bridge improvement. The community supported a replacement of the bridge, and the feasibility study began in 2000.

The Study is organized into three sequential tiers:

- Tier I of the Study documented baseline conditions and identified the project's issues, purpose and need statement, and a range of crossing corridors and facility alternatives. It determined and initiated the environmental review process, and narrowed the corridors and facility alternatives to those that are most promising and practical.
- Tier II was intended to select a crossing corridor, refine the most promising long-term alternatives, select a short-term improvement option, and undertake a financial feasibility study to determine if there would be sufficient financial resources available to fund a long-term improvement project.
- Tier III will conclude the Study by selecting a preferred alternative, developing an implementation plan, and completing the Draft Environmental Impact Statement (DEIS) in compliance with the National Environmental Policy Act (NEPA).

The lead agencies for this study are the Southwest Washington Regional Transportation Council (RTC), the Oregon Department of Transportation (ODOT), and the Washington State Department of Transportation (WSDOT). Parsons Brinckerhoff was retained by the agencies to lead the technical analysis of the project, supported primarily by Entranco, Cogan Owens Cogan, and Zimmer Gunsul Frasca.

Background

Congressional representatives of Washington communities surrounding the Hood River Bridge obtained funding for the Study through the federal transportation funding act known as the Transportation Equity Act for the 21st Century (TEA-21) legislation in 1997. In 1999, a project planning phase was undertaken and a public meeting was held. Major concerns regarding the existing bridge include hazards presented by the narrowness of the travel lanes and lack of bicycle and pedestrian facilities, long-term adequacy of the bridge structure, and impacts on the local economy, especially for commercial vehicles using the bridge.

Three committees have been formed to advise the project team: a Resource/Regulatory Committee (RRC) comprised of representatives of state and federal agencies who will review environmental analyses, documents, and permit applications pertinent to agency regulations; a Local Advisory Committee (LAC) comprised of area residents and business owners; and a Steering Committee (SC) that includes local

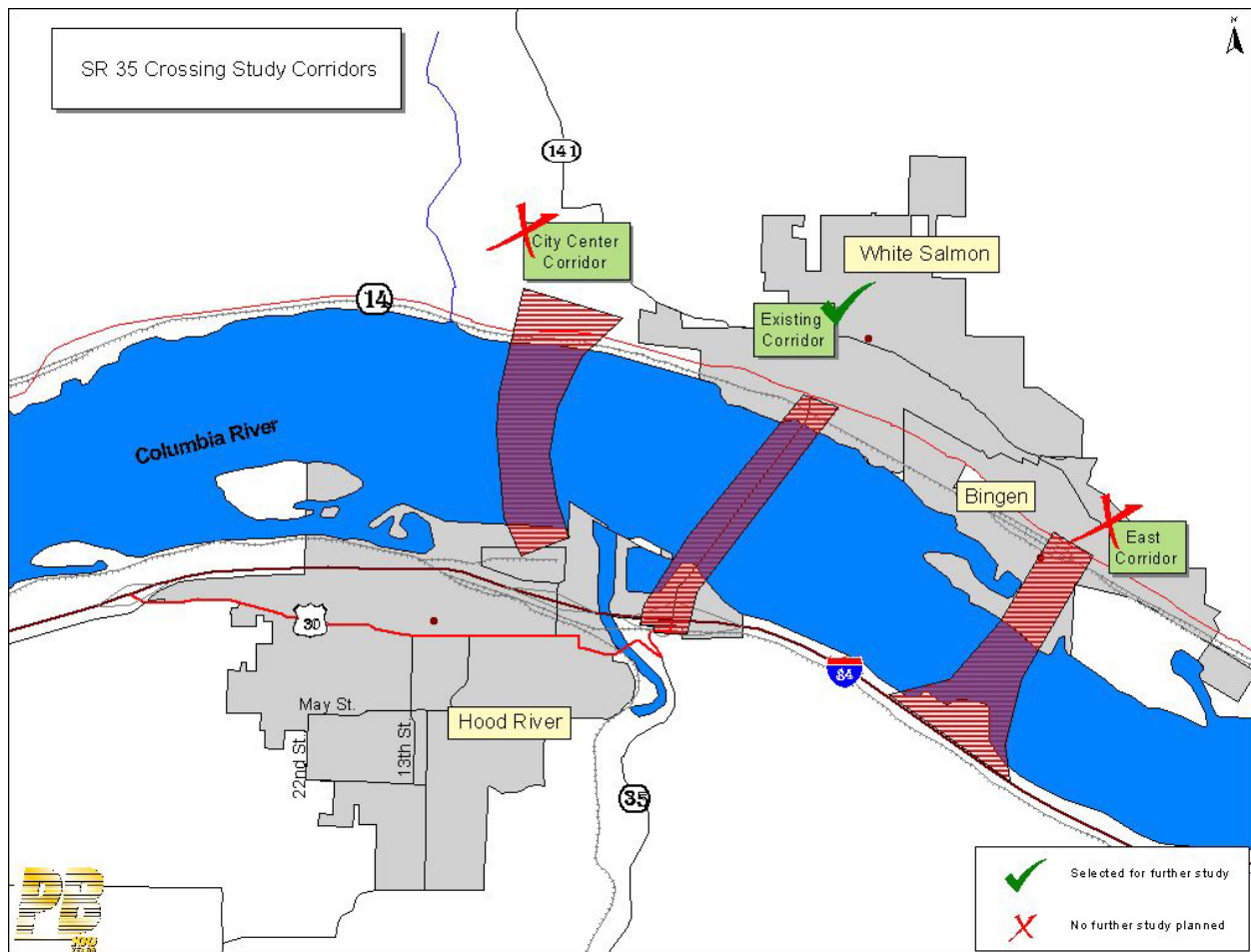
elected and appointed officials and agency staff. A project Management Team comprised of lead staff from RTC, ODOT, WSDOT, and consultant staff meets regularly to oversee the Study process.

Report Purpose

This report is a summary of Tier II findings. It includes a summary of public involvement activities, cost estimates for possible crossing facilities, financial feasibility results for a new crossing, environmental resource surveys and streamlining concurrence process, and an alternatives screening that recommends alternatives for advancement into Tier III. Tier II was completed in June 2002. Tier III is scheduled to be completed by early 2003.

The crossing corridors considered during Tier II are shown in Figure ES-1.

Figure ES-1. Map of Tier II Corridors



Analysis

Public Involvement

Tier II public and agency involvement included the following activities:

- Three meetings each of the project's LAC and SC. Two of these meetings were conducted as joint meetings with both groups.
- One meeting of the RRC.
- Two public open houses.
- A random sample telephone survey and motorist intercept survey of bridge users.
- Two newsletter updates distributed to the project mailing list and via local businesses, civic buildings, and other meetings.
- A youth bridge design contest.
- Media releases, news articles, and radio and newspaper interviews.
- Presentations to Klickitat County Commissioners, White Salmon Rotary, Columbia River Gorge Windsurfing Association, Hood River Rotary, Columbia River Gorge Commission, and Skamania and Klickitat County Transportation Policy committees.

Cost Estimates

Based on the January 2002 design workshop, conceptual drawings (plan and profile) for various bridge types were developed. Within each of the corridors, variations of possible structure types and configurations were defined. Structures varied by lengths and design features (e.g., different types and location of piers, different superstructure types). Construction costs for each alternative were based on unit costs and quantities for major construction components as well as bridge approaches and ancillary work. Additional costs have been included for engineering, construction management, and contingency to arrive at a total project cost. Table ES-1 summarized the cost estimates. Costs for right-of-way acquisition and environmental mitigation are not included.

Table ES-1. Summary of Cost Estimates (2002 dollars)

Corridor	Structure	Estimated Cost Range (millions)
City Center	New Fixed Span Bridge (various types)	\$106-113
	Twin-Bored Tunnel	\$350-400
Existing	New Fixed Span Bridge (various types)	\$110-121
	Retrofit Existing Bridge	\$137
East	New Fixed Span Bridge (various types)	\$129-142
	New Fixed Span Bridge (various types) for vehicles plus retrofit existing bridge for pedestrians and bicycles	\$179-192

Note: Cost estimates for bridges are based on 45-foot wide typical sections.

Financial Feasibility

A financial feasibility study was conducted, which included a discussion of the toll revenue potential, using the public opinion surveys as input as well as an analysis of the level of capital investment that could be supported by tolls. In addition, other potential local non-toll revenue sources were considered and summarized. Results for this study are summarized as follows:

- The revenue maximizing toll has been conservatively estimated at \$1.50 in 2001 dollars. This is equivalent to a toll of \$1.75 in year 2010 dollars, rounded to the nearest quarter.
- In 2010, this toll is expected to generate between \$3.5 and \$4.5 million in gross annual revenues before operation and maintenance (O&M) costs. O&M costs are estimated at approximately \$0.5 million per year in today's dollars.
- The proposed toll structure for financing a new crossing would include increasing toll to \$1.00 in 2004, with 50¢ set aside for capital costs of a new crossing between 2004 and 2010. Increase toll to \$1.75 in 2010 when new crossing opens. Periodically increase toll for inflation in 25¢ increments to maintain a constant real toll.
- Under the proposed toll structure, toll revenues appear capable of financing upwards of \$50 million in project costs.
- Each \$1 million of annual net revenue could finance approximately \$8.8 million of direct capital investment, or about \$10.9 million of project costs including capitalized debt service. This helps put perspective on how \$1 million in annual non-toll local revenues can contribute to overall project costs.
- A tax that charges businesses as well as households, like a property tax, would decrease the household contribution for most households and are the most viable of any local, non-toll financing options.
- \$1 million in annual tax revenue in Washington is equivalent to \$134 per household per year in Klickitat County. If we limit the revenue requirement to White Salmon and Bingen, \$853 per household would be needed in those two cities. On the Oregon side, raising \$1 million annually requires the equivalent of \$138 per household in Hood River County, or \$412 per household in the City of Hood River.
- Limited amounts of state and federal funding may be available, but it is unlikely that they will fund the majority of the project cost. Competitive grants that have the highest potential for funding this project include the Washington Transportation Improvement Board (TIB), Oregon Transportation Investment Account (OTIA), federal Enhancement, and federal High Priority Project program.

Environmental Review and Coordination

To support the alternatives screening process in Tier II, additional environmental surveys for sensitive plants and cultural resources were performed, tribal coordination was initiated, comprehensive screening criteria were developed, and agency coordination with resource and regulatory agencies was conducted. From these

activities, potential critical issues to the natural and built environments were identified for each of corridors. These critical issues were then raised in the alternatives screening process. Final recommendations to advance or eliminate alternatives from further study took into account the reasonable and practical efforts that would be needed to mitigate or contend with these critical issues.

As a bi-state transportation project, the SR-35 Study invokes both the Washington NEPA/SEPA/404 Merger and the Oregon Collaborative Environmental and Transportation Agreement to Streamline (CETAS) environmental streamlining processes. Concurrence on the first two points (Purpose and Need Statement and Criteria for Alternatives Selection) was requested during Tier II. In the Washington Merger process, all agencies have concurred with or have waived participation on both points. In the Oregon CETAS process, most agencies have concurred with both points. However, one non-concurrence was received from the US Fish and Wildlife Service (USFWS) on the Purpose and Need Statement. The ODOT staff that coordinates the Oregon CETAS process is working directly with the USFWS to determine the steps that must be taken to resolve this non-concurrence. Two CETAS agencies, the Oregon Department of Land Conservation and Development (DLCD) and the Oregon Division of State Lands (DSL), have not responded to concurrence requests. ODOT has waived these agencies' participation in the CETAS process. These two agencies will not receive future concurrence requests unless they request to rejoin the project review process.

Transportation

During Tier I, 20-year cross-river traffic forecasts were made to assist with the evaluation. Since the intent of Tier I was to narrow the list of corridors, rather than focus on specific locations, the transportation evaluation consisted of developing vehicle miles traveled (VMT) projections for cross-river traffic for the various corridors.

During Tier II, more detailed transportation information was developed to assist in the evaluation of these alternatives. Transportation considerations at the alternative-level screening were assessed using several measures: vehicle miles traveled, level-of-service (LOS), safety and accidents, bicycle and pedestrian mobility and proximity to existing and planned facilities, commercial goods mobility, and impacts on Interstate (I-84) and National Highway System (SR-14) facilities. The results of this alternative-level analysis were used in the alternatives screening process.

Alternatives Screening and Recommendations

Long-Term Alternatives

Two screening processes to narrow long-term alternatives were conducted during Tier II. The first screening narrowed the build alternatives from 17 to 6. A second alternatives screening was used to select alternatives for evaluation in the DEIS. Screening criteria were developed in accordance with technical expertise, the Purpose and Need Statement, and public and agency comments. Baseline information available on a corridor level and the results of technical studies conducted in Tier II were used as the basis for this screening. Alternatives were screened for their potential to have high, moderate, or low impacts associated with each criterion.

The second screening narrowed the build alternatives from six to one: the Existing Corridor Fixed Span Bridge for All Modes. Reasons for advancing or eliminating build alternatives for further study in the DEIS are summarized in Table ES-2.

The Existing Corridor (EC) Fixed Span Bridge for All Modes alternative was then differentiated into three alternative alignments: EC-1 West Connection to Dock Grade, EC-2 West Alignment, and EC-3 East Alignment. The conceptual alignments of the alternatives are shown in Figure ES-2.

All alternatives tie into the existing bridge access road on the south end of the corridor at a point between the toll booth and the four-way stop. Improvements would be made to the I-84 interchange to include signalization or roundabouts at the ramp termini. The four-way stop at E. Marina Way (port/retail entrance) would be converted to a roundabout. The private driveway onto the access road would be closed. In all scenarios, it is assumed that the toll booth will be converted to one-way operations.

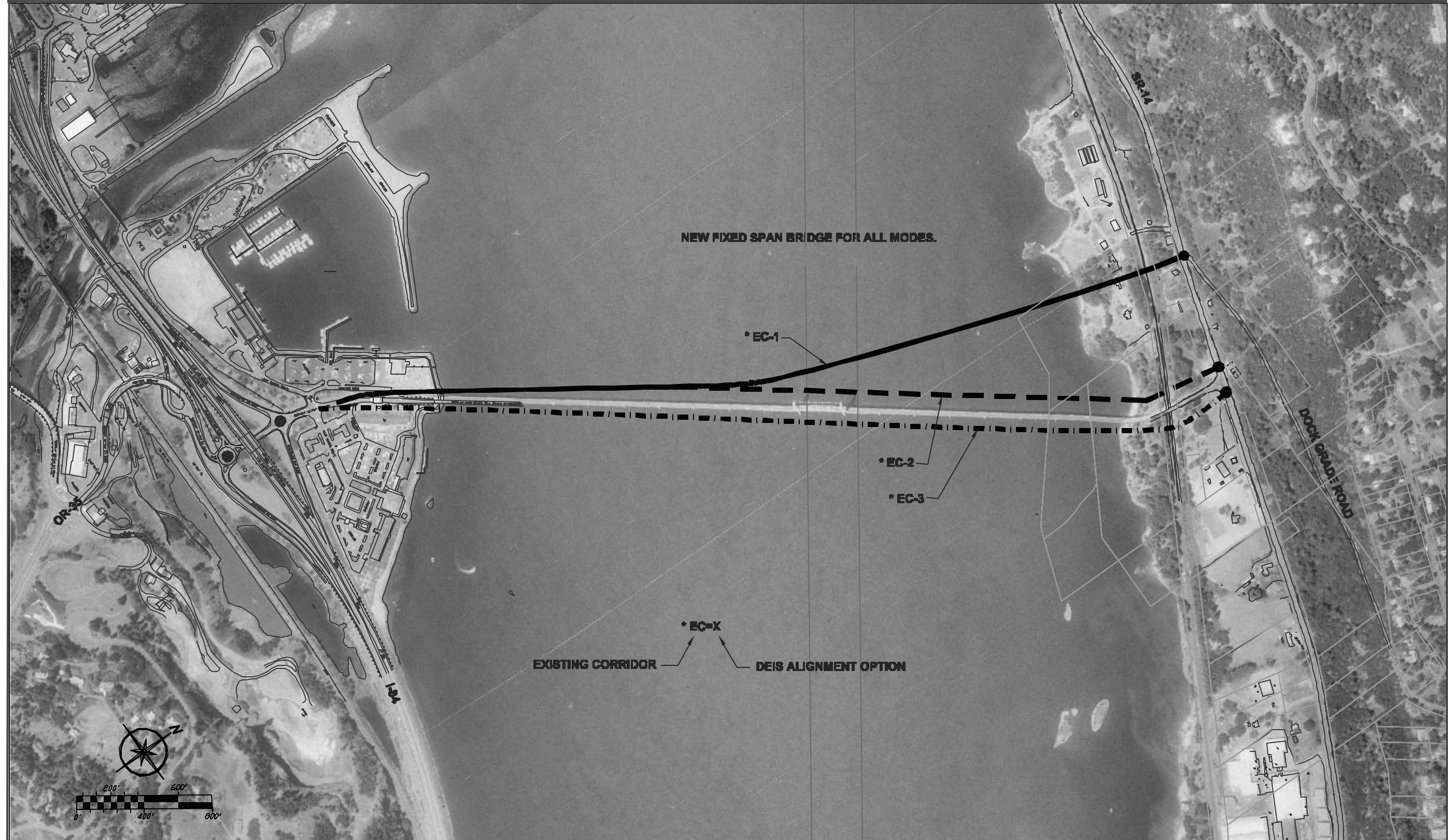
The following summarizes additional components of each alternative.

- **EC-1 West Connection to Dock Grade:** This alternative would be directly adjacent to the west side of the existing bridge until a point north of the shipping channel, where it would shift west to avoid the in-lieu (Native American treaty access) fishing site on the Washington side. It would be grade separated from the railroad mainline on the Washington side. The SR-14 intersection at Dock Grade would be signalized and widened to accommodate turn lanes. The grade of SR-14 would need to be raised, and Dock Grade would need to be realigned at the intersection for safety reasons.
- **EC-2 West Alignment:** This alternative would be directly adjacent to the west side of the existing bridge until a point north of the shipping channel, where it would shift slightly to the west to avoid the in-lieu fishing site on the Washington side. It would be grade separated from the railroad mainline on the Washington side. The SR-14 intersection would be signalized and widened to accommodate turn lanes.
- **EC-3 East Alignment:** This alternative would be directly adjacent to the east side of the existing bridge. It would be grade separated from the railroad mainline on the Washington side. The SR-14 intersection would be signalized and widened to accommodate turn lanes.

These three build alternatives plus the No Action alternative are recommended for further study in the DEIS.

SR 35 COLUMBIA RIVER CROSSING STUDY

SR-35 LONG TERM ALTERNATIVES



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Table ES-2. Summary of Rationale to Advance or Eliminate Alternatives

Corridor	Alternative	Recommendation for Further Study	Reason
City Center	New fixed span bridge for all modes	Eliminate	<ul style="list-style-type: none"> • Adverse impacts associated with water-based recreation, and • Severe geologic constraints on Washington side bridge landing.
City Center	New tunnel with existing bridge retrofit for pedestrian and bicycle use	Eliminate	<ul style="list-style-type: none"> • Substantial increase in vehicle-miles-traveled, • Substantial excavation in steep slope on Washington side portal, • High cost, and • High level of business displacement in Hood River.
Existing	New fixed span bridge for all modes	Advance	<ul style="list-style-type: none"> • Lowest impacts to transportation, • Lowest impacts to environmental resources, • Lowest impacts to recreation, and • Lowest cost.
Existing	Retrofit of existing bridge for all modes	Eliminate	<ul style="list-style-type: none"> • Identical low impacts as existing new fixed span, except it has higher capital costs and higher construction impacts.
East	New fixed span bridge with existing bridge retrofit for pedestrian and bicycle use	Eliminate	<ul style="list-style-type: none"> • High impacts to fish from in-water work associated with two bridges; • High environmental impacts associated with Bingen Pond, nearby peregrine falcons and bald eagles, and wetlands on Oregon approach; • High visual impacts associated with two bridges; • Four goal exceptions to Oregon statewide planning goals; • Potential encroachment on Koberg State Park; and • High cost (two bridges, new I-84 interchange, BNSF railway bypass).
East	New fixed span bridge for all modes	Eliminate	<ul style="list-style-type: none"> • High travel distances for pedestrians and bicyclists; • High environmental impacts associated with Bingen Pond, nearby peregrine falcons and bald eagles, and wetlands on Oregon approach; • Four goal exceptions to Oregon statewide planning goals; and • Potential encroachment on Koberg State Park.

Short-Term and Mid-Term Improvements

Short-term improvements are low-capital cost physical and operational improvements that are needed within the next five years to maintain or improve traffic operations on the existing bridge. Additionally, a set of mid-term improvements is recommended in case the bridge replacement is more than ten years away. These improvements would maintain or improve traffic operations in the 6-10 year timeframe. Figure ES-3 shows the short-term improvements recommended during Tier II.

Short-Term Improvements

Recommended short-term improvements to the existing bridge include:

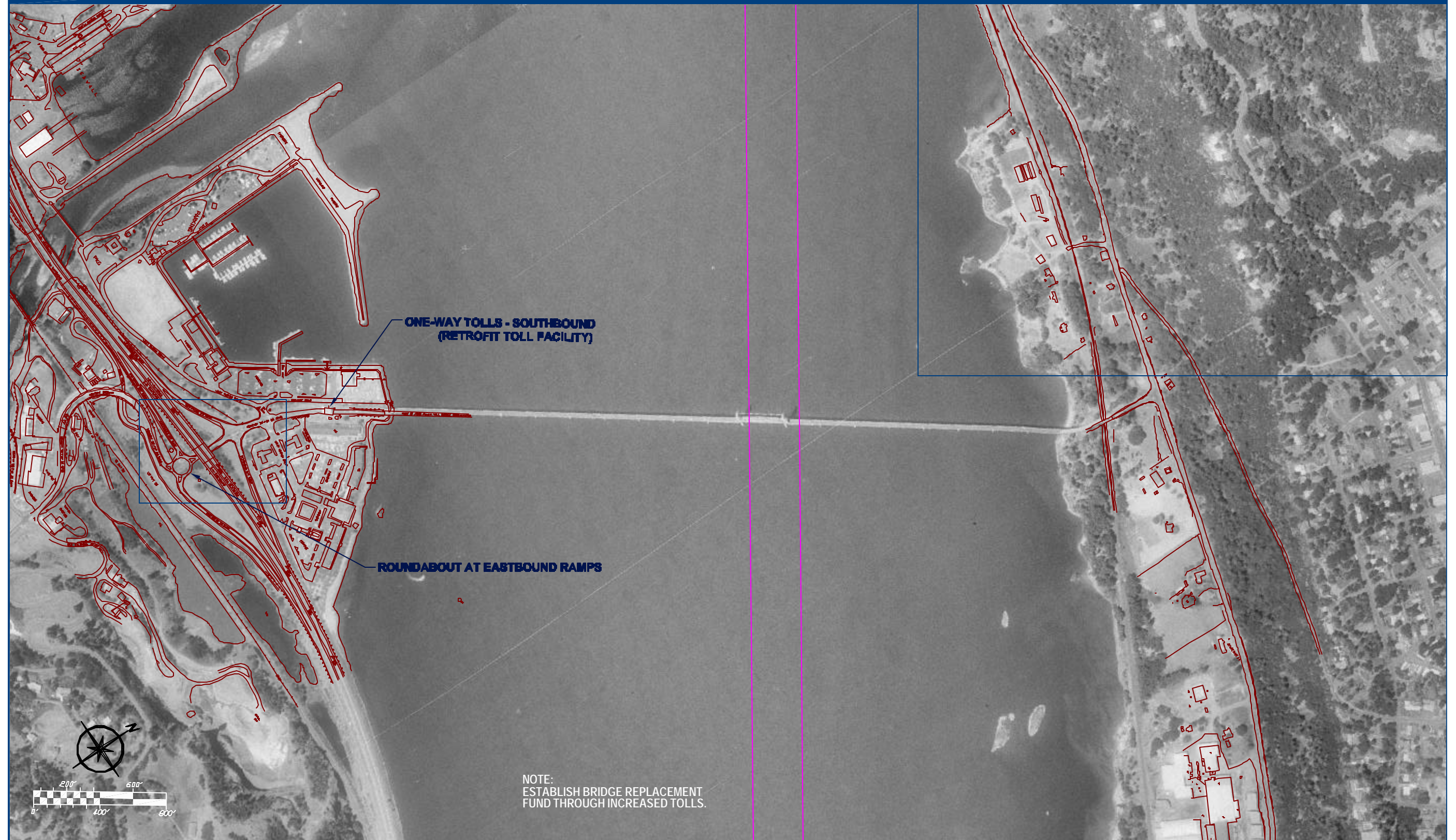
- Roundabout or traffic signal at I-84 eastbound ramps and Oregon 35/Hood River Bridge access road: This would reduce or eliminate peak traffic episode queuing and spillback onto the I-84 mainline. A roundabout is recommended due to the close proximity of Oregon 35, as well as the offset nature of the eastbound I-84 off- and on-ramps.
- Convert the toll booth to one-way tolls southbound: At peak traffic times, northbound traffic passing through the toll booth spills back through the adjacent four-way stop intersection. This is forecast to be a daily occurrence in the short-term future. In the long-term, these queues could block the I-84 ramp intersections. Converting the toll booth to one-way tolls southbound (\$1.50 toll paid once, rather than \$0.75 paid each way) will eliminate the potential for spillback queues affecting intersection and I-84 traffic operations. In the southbound direction, if queues form, the entire bridge can be used for the queue storage length, which does not impact any adjacent intersection. The one-way tolls should reduce the ongoing operating costs to the Port of Hood River by reducing the number of toll takers needed to operate the toll booth. The short-term conversion would consist of a retrofit of the existing toll booth, minor pavement widening to allow for northbound traffic to flow safely through the toll plaza, and signage changes and removals.
- Bridge replacement fund: A dedicated fund would be established through increased tolls to fund a replacement bridge. In the short-term, these would be collected by the Port of Hood River under an interagency agreement with the Washington State and Oregon Departments of Transportation.

Cost for these improvements are shown below. These costs do not include the cost of right-of-way acquisition nor do they include costs for environmental impact mitigation.

- \$270,000 for the roundabout
- \$100,000 for the toll booth conversion to one-way tolls
- \$573,500 total cost for short-term improvements (including additional costs for engineering, construction management, and contingencies).

SR 35 COLUMBIA RIVER CROSSING STUDY

SR-35 SHORT TERM IMPROVEMENTS



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Mid-Term Improvements

If the replacement of the bridge is not programmed to occur for at least ten years, traffic and congestion growth will result in additional improvements needed to maintain or improve traffic operations on the bridge. The recommended mid-term improvements to the existing bridge include:

- Signalize the I-84 westbound ramps at the Hood River Bridge access road: This would alleviate the future failing level-of-service at the interchange.
- Convert to a roundabout or signalize the four-way stop at the port/retail entrance: The four-way stop, which stops all vehicles, will eventually become a bottleneck and result in traffic spillbacks either into the toll booth area, or into the I-84 interchange area. Additionally, with short-term improvements at the I-84 ramps and at the toll booth to improve traffic flow, having a stop sign in the center of an otherwise flowing corridor may actually increase accidents over time.
- Restrict or close turns at the private driveway onto the Hood River Bridge access road: Vehicles turning left into, or out of, the driveway conflict with bridge traffic. With increased traffic, congestion, and queuing at the toll booth, and the increased potential for accidents, turning movements at the driveway should be restricted at a minimum to right-turns only, and potentially closed if the accident rate increases.
- Toll booth and automated toll collection system: This would alleviate southbound queuing near the toll booth by allowing regular bridge users to use automated toll collection. Project includes removal of current toll booth and the construction of new toll booth, canopy, and communication system to support automated toll collection. The new toll booth would be designed and built so that it would not need to be replaced with the construction of a long-term improvement in this corridor.
- Signalize the SR-14/Hood River Bridge access road intersection: Eventually, this intersection will experience LOS E/F conditions, which could result in higher accident rates as left-turning vehicle drivers become impatient with longer wait times and begin to attempt turns into unsafe gaps in traffic.

Cost for these improvements are shown below. These costs do not include the cost of right-of-way acquisition nor do they include costs for environmental impact mitigation.

- \$160,000 for the traffic signal at the westbound ramps
- \$270,000 for the roundabout at the Port/Retail intersection
- \$20,000 for the turn restriction or closure at the private driveway
- \$750,000 for toll booth and automated toll collection system
- \$160,000 for the signal at SR-14.
- \$2.1 million total cost for mid-term improvements (including additional costs for engineering, construction management, and contingencies).

Process to Implement Improvements

Short-term and mid-term improvements would need to be implemented by the agency having jurisdiction over the location being improved. The recommended Bridge Replacement Fund would not be initiated and used for short-term improvements, unless the DEIS determines that the preferred alternative is the no-action alternative.

To implement these improvements, both WSDOT and ODOT would need to incorporate the short-term and mid-term improvements into their collective highway system plans (ODOT: Oregon Highway Plan; WSDOT: Highway System Plan component of Washington's Transportation Plan). Once these documents were amended, funding for ODOT and WSDOT improvements would be sought through the State Transportation Improvement Program (STIP) process.

The Port of Hood River would implement projects through its Transportation Improvement Program or capital budget.

Next Steps

Tier III

Tier III could begin in the summer of 2002 and would include selection of a preferred long-term alternative, completion of the DEIS, and preparation of a financial and implementation plan.

Beyond Tier III

If Tier III is completed, then a Final Environmental Impact Statement (FEIS) would be prepared after the DEIS was circulated to the public. The FEIS would include a response to comments received during the public comment period and any modifications to the design or environmental impact mitigation previously identified in the DEIS, if necessary. After a Record of Decision is issued on the FEIS, preliminary engineering would occur. Funding for the FEIS and preliminary engineering would be sought during Tier III.

Decision to Continue Study Into Tier III

A meeting with the WSDOT and ODOT Regional Administrators was held in early June 2002. At this meeting, the Regional Administrators decided to postpone making the decision on whether to continue the Study into Tier III. Further discussions with WSDOT and ODOT will continue for several months. A decision on entering Tier III is expected at the end of Summer 2002. During this interim period, limited public involvement, design, and environmental activities will continue.

TIER II REPORT

INTRODUCTION

The SR-35 Columbia River Crossing Feasibility Study is being conducted in response to local business and resident concerns about the safety and service life of the existing Hood River Bridge. The project began in 1999, with the plan for a feasibility study to determine if there was a need to replace the bridge and whether there was community support for a bridge improvement. The community supported a replacement of the bridge, and the feasibility study began in 2000. A full description of the project need and background is provided in the Tier I Report. Further details are also available on the study website at <http://www.rtc.wa.gov/Studies/SR35>.

The Study is organized into three sequential tiers:

- Tier I of the Study documented baseline conditions and identified the project's issues, purpose and need statement, and a range of crossing corridors and facility alternatives. It determined and initiated the environmental review process, and narrowed the corridors and facility alternatives to those that are most promising and practical.
- Tier II was intended to select a crossing corridor, refine the most promising long-term alternatives, select a short-term improvement option, and undertake a financial feasibility study to determine if there would be sufficient financial resources available to fund a long-term improvement project.
- Tier III will conclude the Study by selecting a preferred alternative, developing an implementation plan, and completing the Draft Environmental Impact Statement (DEIS) in compliance with the National Environmental Policy Act (NEPA).

The lead agencies for this study are the Southwest Washington Regional Transportation Council (RTC), the Oregon Department of Transportation (ODOT), and the Washington State Department of Transportation (WSDOT). Parsons Brinckerhoff was retained by the agencies to lead the technical analysis of the project, supported primarily by Entranco, Cogan Owens Cogan, and Zimmer Gunsul Frasca.

REPORT PURPOSE

This report is a summary of Tier II findings. It includes a summary of public involvement activities, cost estimates for possible crossing facilities, financial feasibility results for a new crossing, environmental resource surveys and streamlining concurrence process, recommendations for short-term and long-term improvements, and an alternatives screening that recommends alternatives for advancement into Tier III. Tier II was completed in June 2002. Tier III is scheduled to be completed by early 2003.

OVERVIEW OF TIER II

Tier II began in the summer of 2001 and concluded in June 2002. It selected a crossing corridor, developed the most promising long-term alternatives, selected a short-term improvement option, and undertook a financial feasibility study to determine if there are sufficient financial resources available to fund a long-term improvement project.

Tier II included conducting two alternatives screenings. The first screening resulted in the number of build alternatives being narrowed from 17 to 6. A second screening was conducted near the end of Tier II, which selected one crossing corridor and narrowed the range of long-term alternatives to three for further study in the DEIS. Included in the second screening were costs estimates and more detailed environmental and transportation information.

Tier II also included conducting a survey of bridge users and a random sample survey of area residents and business operators. A financial feasibility study was prepared to identify current and potential future funding resources and to determine whether it would be feasible to fund long-term improvements. Refined cost estimates and engineering work were developed to support the financial feasibility study.

Short-term traffic projections (Year 2005) were developed to examine the need for improvements to maintain traffic operations on the bridge and at the bridge endpoints. Based on this analysis, short-term (within five years) and mid-term (6 to 10 years) improvements were identified.

Tier II concluded with narrowing options to three long-term alternatives and making a decision for continuing with this Study into Tier III. If the study enters Tier III, activities would consist of the selection of a preferred alternative through the DEIS process and the completion of a financing and implementation plan for the preferred long-term alternative.

PUBLIC AND AGENCY INVOLVEMENT

Tier II public and agency involvement included the following activities:

- Three meetings each of the project's Local Advisory Committee (LAC) and Steering Committee (SC). Two of these meetings were conducted as joint meetings with both groups.
- One meeting of the Resource Regulatory Committee (RRC).
- Two public open houses.
- A random sample telephone survey and motorist intercept survey of bridge users.
- Two newsletter updates distributed to the project mailing list and via local businesses, civic buildings, and other meetings.
- A youth bridge design contest.

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- Media releases, news articles, and radio and newspaper interviews.
 - Presentations to Klickitat County Commissioners, White Salmon Rotary, Columbia River Gorge Windsurfing Association, Hood River Rotary, Columbia River Gorge Commission, and the Skamania and Klickitat County Transportation Policy committees.

These activities are summarized in more detail below. A complete set of meeting summaries, news releases, and other public involvement materials is provided in Appendix A.

Local Advisory and Steering Committee Meetings

The SC and LAC met three times; in two cases both committees met as a single group. Purposes of the meetings included:

- **First meeting, September 2001.** In separate committee meetings, participants reviewed and affirmed proposed evaluation criteria for alternatives studied in Tier II. They also reviewed first screening results for Tier II alternatives and suggested refinements to staff recommendations. In addition, they reviewed and commented on plans for the upcoming random sample survey and public open house.
- **Second meeting, January 2002.** In a joint meeting, committee members participated in a design review workshop to identify design objectives and recommend design types for each corridor. Prior to the workshop portion of the meeting, the Management Team provided an overview of different types of bridge designs/structures and reported the results of the random sample and motorist intercept surveys.
- **Third meeting, May 2002.** At this joint meeting of the committees, participants reviewed the Management Team's recommendations regarding alternatives to carry into Tier III. Committee members confirmed/suggested changes to these recommendations. They also reviewed results of a financial feasibility study of alternatives and short-term solutions for addressing deficiencies of the existing bridge.

Resource Regulatory Committee

Early in Tier II, the evaluation criteria to be used in the alternatives screening was mailed to RRC members for their review. This group then met in February 2002 to review results of the initial alternatives screening and discuss potential impacts to environmental resources. The Management Team also presented information on the Oregon and Washington concurrence process, results of the February Public Open House, and remaining activities to be conducted in Tier II. Much of the discussion among the group focused on possible impacts related to the East Corridor, including access to Koberg State Park and impacts to wildlife near Bingen Pond (see Appendix A for a summary of comments received).

Public Meetings

Two public open houses were conducted in this Tier:

- **First open house, October 2001.** Participants reviewed and commented on results of a preliminary screening of crossing alternatives, including recommendations from the Management Team and advisory committees about alternatives that should be carried forward in the study. Participants “voted” on the options they thought should be carried forward. Attendees also listened to a presentation on the background and progress of the Study, asked general questions, and provided information about how often and for what purposes they use the existing bridge.
- **Second open house, February 2002.** The focus of this meeting was to gather input on bridge design alternatives recommended by the advisory committees and developed by the Management Team. Participants reviewed and commented on alternative designs for facility options in each crossing corridor. Also at this meeting, winners of a youth design contest received awards and prizes donated by local businesses and civic organizations. As in the previous open house, participants listened to a presentation on the status and results of the Study to date and had the opportunity to comment and ask questions.

Summaries of the public open houses, including comments received from participants, are provided in Appendix A.

Random Sample Telephone Survey / Intercept Survey

The Gilmore Research Group conducted a public opinion survey of residents in and around Bingen, Hood River, and White Salmon in October 2001. These surveys consisted of a randomly sampled telephone survey of 400 local residents and an intercept survey of bridge users on a Sunday and Monday. Survey topics included:

- How often and for what purposes people use the bridge
- Perceived need for a new and/or improved crossing
- Relative support for alternative crossing locations
- Opinions about the most preferable way to pay for a possible new or improved crossing
- Willingness to pay specific levels of tolls or other taxes or fees to fund a new bridge
- General information about participants’ residence, age, and income level

Results of the survey were used to determine the optimal level of future tolls to help fund proposed crossing improvements and the level of support for other possible local funding mechanisms.

Newsletter Updates

Two newsletters were prepared and distributed in July 2001 and February 2002 to the project’s mailing list of approximately 400 people via mail and e-mail. Newsletters also

were distributed via local businesses, libraries, city halls, and other gathering places, as well as at public meetings and speaking engagements. The first newsletter focused on the results of the first Tier II screening process and also described upcoming public involvement activities and the status of the project. The second newsletter covered results of the random sample survey and design workshop as well as upcoming public meetings and the youth design contest.

Youth Bridge Design Contest

Young people between the ages of 5 and 18 were invited to submit drawings of a new bridge across the Columbia River. Local businesses donated prizes that were awarded to first, second, and third place winners in three age groups. Two special prizes also were awarded in the youngest age group. Sponsors included including Da Kine, Discover Bicycles, Hood River Aquatics Center, Hood River Outfitters, McDonalds, Pietro's Pizza and Wal-Mart. The contest was advertised through articles in the local newspaper and notices and entry forms distributed via schools in Hood River and White Salmon, recreational facilities, youth organizations, and local businesses. Prizes were awarded at the public open house in February 2002. Local newspapers also covered the results of the contest, including pictures of the winning entries. Besides being a fun event for those who competed, the contest increased awareness of the project and attendance at the February public meeting.

Media Releases and News Articles

The consultant team prepared and distributed five media releases during Tier II to announce each committee meeting and public open house and to provide information about the random sample survey, the motorist intercept survey, and the youth design contest. Following news releases, the project manager was frequently contacted by media personal to provide additional information for articles. Each media release resulted in articles in the *Hood River News* and/or *White Salmon Enterprise* (see Appendix A for copies of the media releases). The Management Team also contacted reporters with the two local newspapers by e-mail and telephone to provide additional information about the design contest. Editors of both papers served as judges for the contest. The project manager also participated in a radio interview in November 2001 with KHR in Hood River.

Speaking Engagements

Members of the Management Team presented information about the Study to several local groups, including the Columbia Gorge Windsurfing Association, Klickitat County Board of Commissioners, White Salmon Rotary, Hood River Rotary, and Columbia River Gorge Commission. In addition, project personnel also made regular presentations to the Skamania and Klickitat County Transportation Policy committees at monthly meetings.

COST ESTIMATES

Cost Methodology

Based on the January 2002 design workshop, conceptual drawings (plan and profile) for various bridge types were developed (included in Appendix B). Within each of the corridors, variations of possible structure types and configurations were defined. Structures varied by lengths and design features (e.g., different types and location for piers, different superstructure types).

Quantities for each of the major construction components were developed from the conceptual plan and profile drawings and typical sections. These quantities were specific to each of the corridor alternatives.

Unit cost for the various quantities were then developed from historical cost data for similar projects and checked against current bid data available from both Oregon and Washington State Department of Transportation web sites. For approach work and other ancillary work on each side of the proposed bridge structures, typical section composite unit costs were developed and applied based on the quantity of bridge approaches indicated on the conceptual plans.

Construction costs for each alternative were then calculated by listing estimated cost in 2002 dollars by major construction category. Additional costs were then added for engineering, construction management, and contingency in order to arrive at a total project cost.

Long-Term Alternatives

General structural descriptions were conceptualized for the various corridors identified below (see Appendix B for full descriptions):

City Center Corridor

- Cable stayed with girder segmental approach and delta piers
- Tied arch with girder segmental approach and wedge piers
- Concrete haunch girder segmental with tapered piers
- Steel girder segmental with tapered piers
- Twin-bored tunnel

Existing Corridor

- Girder segmental with wedge piers
- Haunched girder segmental with delta piers
- Retrofit existing bridge

East Corridor

- Girder segmental with wedge piers
- Arch with girder segmental approach and wedge piers
- Hybrids (combination of the a new fixed span bridge and a retrofit of the existing bridge for pedestrian and bicycle use only)

Cost estimates were developed for each of these types of structures as summarized in Table 1. Costs for right-of-way acquisition and environmental mitigation are not included in these estimates.

**Table 1
Cost Estimates for Structures Considered for Long-Term Alternatives**

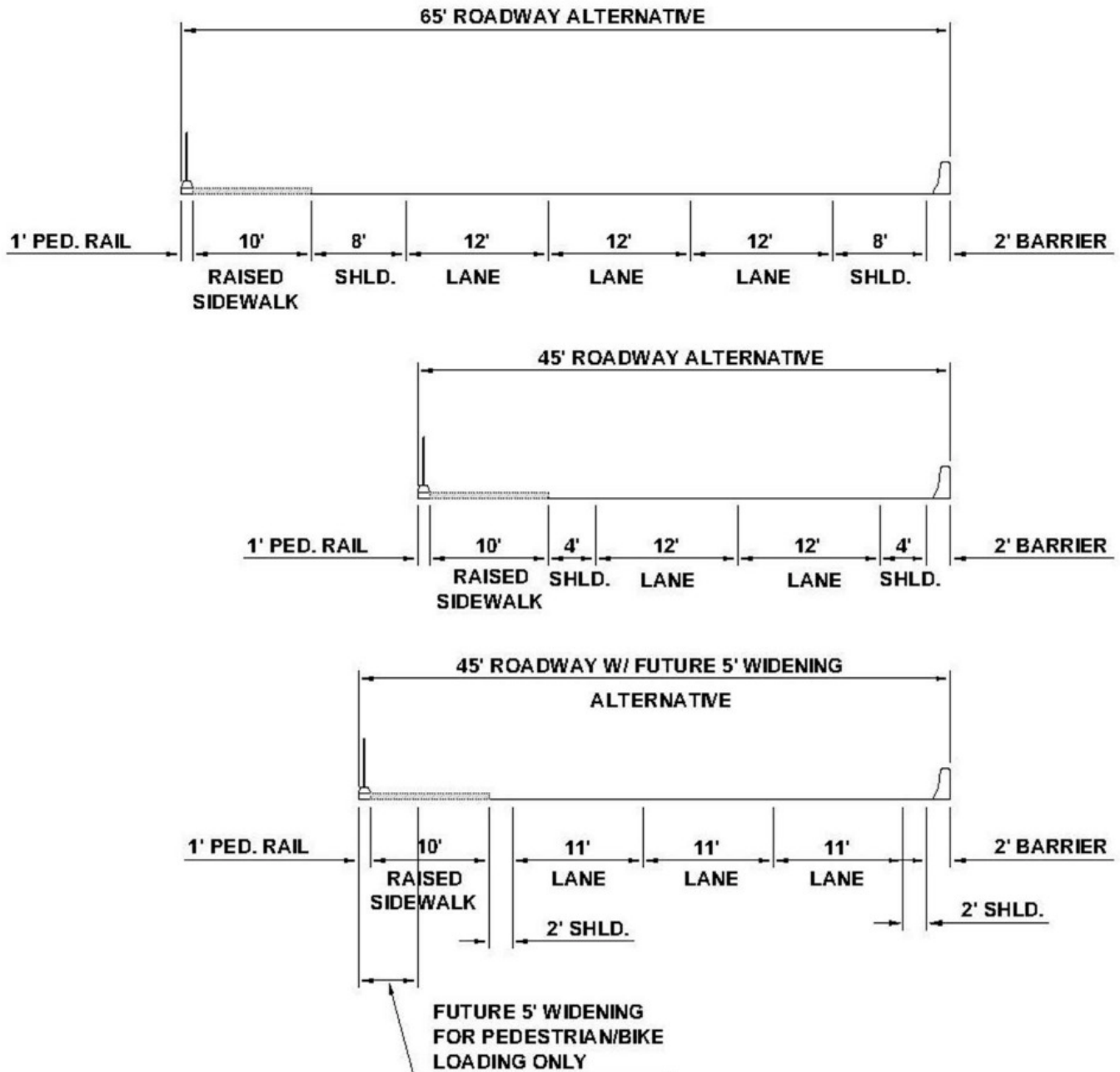
Corridor	Structure	Cost for 65-Foot-Wide Roadway (millions)	Cost for 45-Foot-Wide Roadway (millions)
City Center	Cable Stayed with Girder Segmental Approach and Delta Piers	\$141	\$113
	Tied Arch with Girder Segmental Approach and Wedge Piers	\$132	\$106
	Concrete Haunch Girder Segmental with Tapered Piers	\$141	\$113
	Steel Girder Segmental with Tapered Piers	\$136	\$109
	Twin-bored Tunnel	~\$350-400	
Existing	Girder Segmental with Wedge Piers	\$151	\$121
	Haunched Girder Segmental with Delta Piers	\$137	\$110
	Retrofit Existing Bridge	\$172	\$137
East	Girder Segmental with Wedge Piers	\$161	\$129
	Arch with Girder Segmental Approach and Wedge Piers	\$178	\$142
	Hybrids (new fixed span plus retrofit existing bridge for pedestrian and bicycle use)	\$211-228	\$179-192

Bridge costs were estimated for two roadway widths: 65-foot and 45-foot. Figure 1 illustrates roadway concepts of these two widths plus the potential to expand the 45-foot roadway in order to accommodate three travel lanes.

The 65-foot roadway consists of:

- One 10-foot pedestrian/bike path along the downstream side of any alternative,
- Two 8-foot shoulders, and
- Three 12-foot travel lanes.

**Figure 1
Roadway Typical Sections**



The 45-foot roadway section consists of:

- One 10-foot pedestrian/bike path along the downstream side of any alternative,
- Two 4-foot shoulders, and
- Two 12-foot travel lanes.

The 45-foot option also is conceptualized to accommodate a future 5-foot pedestrian/bike-only widening. This will provide the necessary added width to re-stripe the lanes to a 10-foot pedestrian/bike path, two 2-foot shoulders, and three 11-foot travel lanes. No costs were developed for this future expansion.

Short- and Mid-Term Improvements

The short-term improvements (within five years) provide for traffic improvements to the existing bridge and roadway approaches. All improvements are recommended to occur on the Oregon side approach. Two improvements have been identified to remedy the current traffic issues in the short-term: a roundabout or traffic signal at I-84 eastbound ramps and Oregon 35/Hood River Bridge access road, and conversion of the toll booth to one-way tolls southbound. More detailed descriptions of these improvements are provided in a later chapter (pages 31-34). Estimated costs for these short-term improvements are \$573,500.

Mid-term improvements (within 6-10 years) would include signaling the I-84 westbound ramps at the Hood River Bridge access road; converting to a roundabout or signalize the four-way stop at the port/retail entrance; restricting or closing turns at the private driveway onto the Hood River Bridge access road; reconstruction the toll booth and upgrading to an automated toll collection system; and signaling the SR-14/Hood River Bridge access road intersection. More detailed descriptions of these improvements are provided in a later chapter (pages 31-34). Estimated costs for these mid-term improvements are \$2.1 million.

FINANCIAL FEASIBILITY

Introduction

As part of Tier II of the study, public opinion surveys were conducted in October 2001. This consisted of a randomly sampled telephone survey of 400 local residents and an intercept survey of bridge users on a Sunday and Monday. Key objectives of both surveys were to gather information about bridge user travel patterns, gauge interest in a new crossing, and identify their willingness to pay higher tolls—the latter being a key source of financing for a new facility. Results from the survey, combined with a traffic projection model, can then be used to consider the financial feasibility of various funding scenarios. This section highlights portions of the Financial Feasibility Study (Appendix C) conducted in Tier II.

Traffic Projections

Building on previous Tier I work, more detailed traffic projections were produced in Tier II to support the financial feasibility analysis. This involved the development of an econometric regression model to “explain” traffic as a function of various economic and demographic variables, which can then be used to forecast future traffic trends based upon projections for these variables. At the same time, a time-series model was fit to historic traffic data to project future seasonality. The baseline forecast assumes that periodic adjustments to the nominal toll are only intended to compensate for inflation.

Survey Toll Opinions and Elasticity Concepts

Given the long history of tolls on this bridge, continuing the toll has been put forth as a probable source of funding for a new crossing. In fact, 69% of respondents in the telephone survey supported tolls as a means to finance a new crossing. In order to fully understand and apply the public opinions regarding tolls and to ascertain its funding potential, it is useful to review the concept of toll elasticity of demand and how it relates to the revenue maximizing toll.

The concept of demand sensitivity to changes in tolls is referred to as the elasticity of demand. Demand is said to be inelastic if a marginal toll increase causes a relatively small decline in demand such that overall revenue increases. However, the elasticity of demand is not constant across different toll rates. As bridge tolls rise to consume a larger share of a user’s budget, the user becomes increasingly sensitive to further increases, and thus more likely to travel less in order to limit total expenditures. The survey analysis and results indicate that bridge traffic demand is generally inelastic, such that there is a range of toll rates up to \$2.00 that will generate more revenue. Table 2 presents the matrix of maximum revenue toll-rates and percentage shares of overall travel, for market segments identified from the intercept survey.

As shown in Table 2, the overall maximizing toll rate is \$2.00. Demand for most of the market segments did not fall off sufficiently fast to lower total revenue at tolls between the current 75¢ and \$2.00. Table 3 presents the matrix of maximum revenue toll rates and percentage shares of overall travel for various phone survey market segments. The overall revenue maximizing toll rate was also \$2.00 for the phone survey respondents.

Table 2
Intercept Survey Revenue Maximizing Toll by Market Segment

Intercept Survey Expanded to Monthly Travel — Revenue Maximizing Toll by Market Segments	All Intercept Respondents	Commute & Business Trip Purposes	All Other Trip Purposes	1 Round-Trip per Week	2-4 Round-Trips per Week	5+ Round-Trips per Week
All Intercept Respondents	\$2.00 100%	\$2.00 44%	\$2.00 57%	\$2.00 21%	\$2.00 26%	\$2.00 53%
Washington Residents*	\$2.00 78%	\$2.00 33%	\$2.00 45%	\$2.00 11%	\$2.00 20%	\$2.00 47%
Oregon Residents	\$2.00 22%	\$2.00 11%	\$1.50 11%	\$2.00 10%	\$1.00 5%	\$2.00 7%
Monday / Weekday Users	\$2.00 74%	\$2.00 41%	\$2.00 34%	\$2.00 13%	\$2.00 19%	\$2.00 43%
Sunday / Weekend Users	\$1.50 ¹ 26%	\$2.00 3%	\$1.50 23%	\$2.00 8%	\$1.00 7%	\$1.00 11%

* Includes an insignificant percentage of residents from other states
¹ Insignificantly different at all surveyed toll rates

Table 3
Phone Survey Revenue Maximizing Toll by Market Segment

Phone Survey Respondents with Weekly Bridge Use — Revenue Maximizing Toll by Market Segments	All Phone Respondents	Commute & Business Trip Purposes	All Other Trip Purposes
All Phone Respondents	\$2.00 ² 100%	\$2.00 32%	\$1.00 ¹ 68%
Age 18 - 24 or > 65 Years	\$1.00 29%	\$1.50 5%	\$1.50 ³ 24%
Age 25 - 65 Years	\$2.00 71%	\$2.00 27%	\$1.50 44%
Income < \$30,000	\$2.00 32%	\$2.00 8%	\$1.00 ¹ 22%
Income > \$30,000	\$1.00 ¹ 60%	\$2.00 21%	\$2.00 ² 40%

¹ Insignificantly different from \$0.75
² Demand exhibits two similar revenue maxima, the other at \$1.00
³ Responses for those aged 65+ were dissimilar to those aged 18-24

Proposed Toll Policy and Financing Options

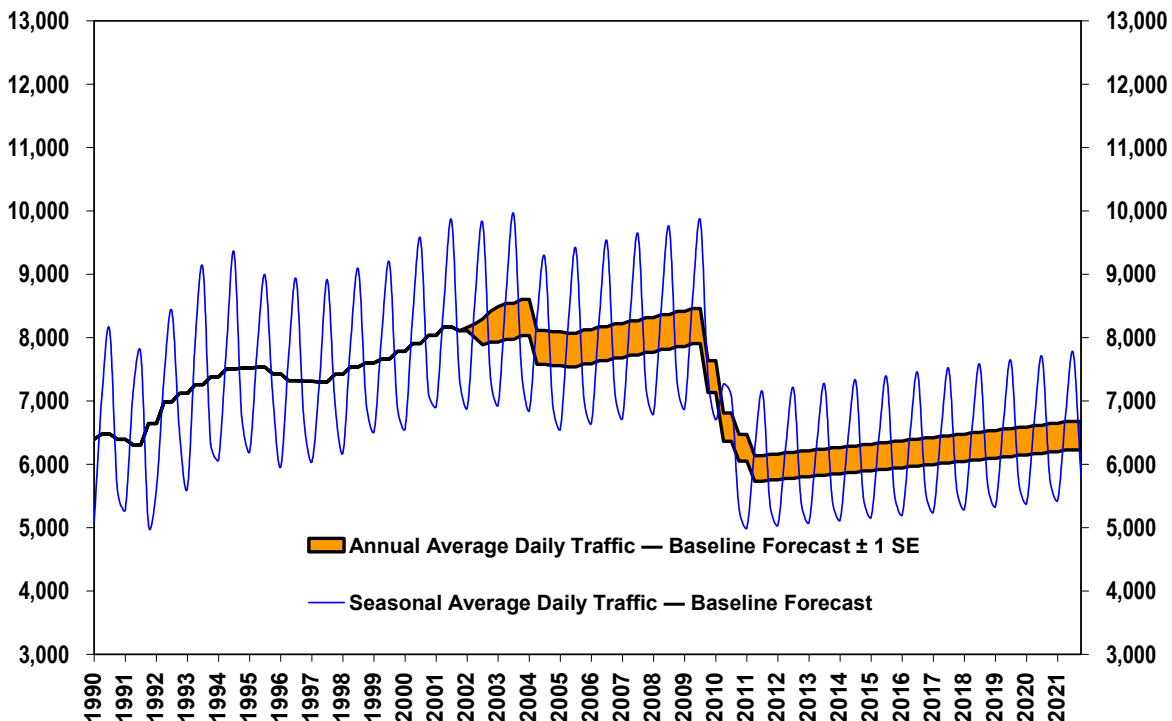
The following presents a proposed toll policy for a new crossing and considers the toll revenue and bond financing capacity of this toll structure.

Revenue Maximizing Toll Rate and Traffic Forecast

Although the survey results indicate that the revenue maximizing toll is upwards of \$2.00, a conservative estimate of \$1.50 in today's dollars has been assumed as the optimal toll. This rate errs on the low side to favor mobility and takes into account that demand may become more elastic over time. By the time a new crossing is open, inflation will have caused a \$1.50 toll rate to be at least \$1.75. Therefore, the assumption of this financial analysis is that the nominal toll would be bumped to \$1.00 in 2004 to begin generating some new revenue toward bridge replacement, and to \$1.75 in 2010 when a new crossing opens. Raising the toll all the way to \$1.75 in 2004 would significantly improve the project's financial feasibility by allowing more funds to be banked for construction, thereby reducing borrowing and debt service costs. However, it may be politically challenging to immediately implement the full increase in the real toll from the current 75¢.

Using the estimated elasticities, this toll structure yields a traffic projection that is lower than would exist without a real toll increase, as shown in Figure 2.

**Figure 2
History and Increased Toll Forecast of
Hood River Bridge Average Daily Traffic**



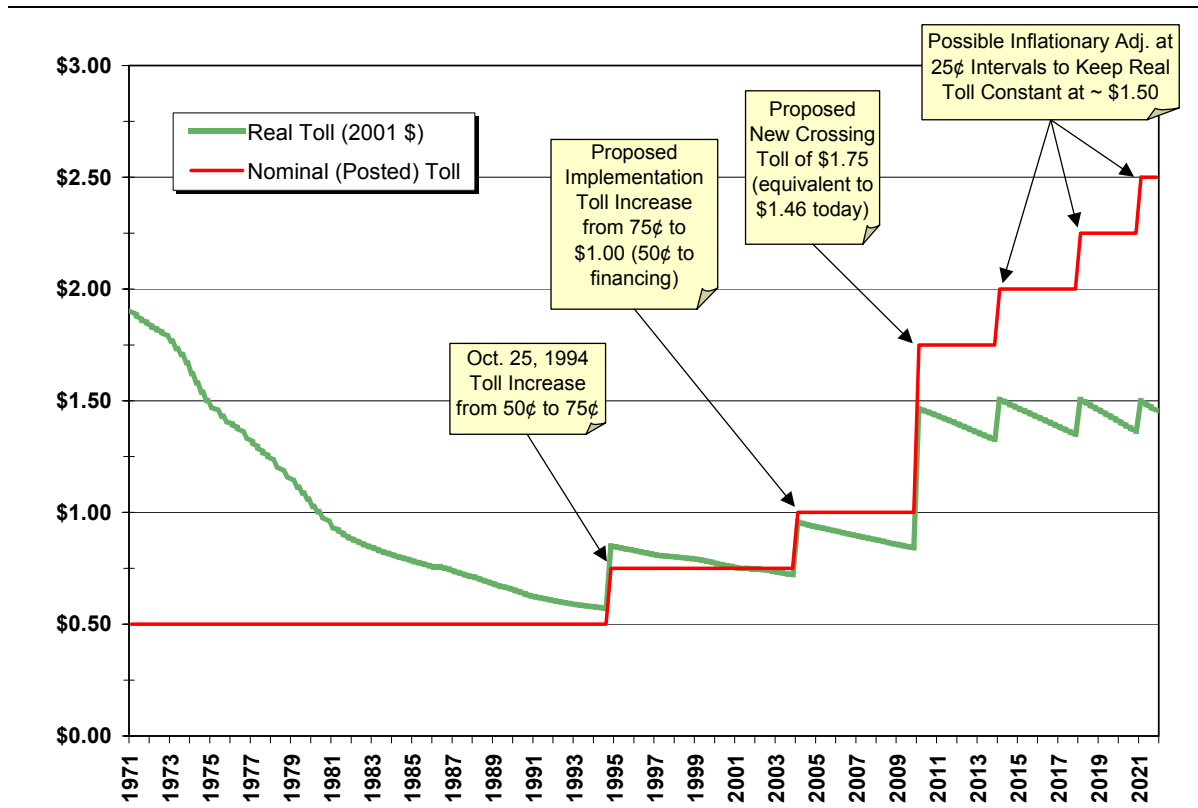
Toll Policy Considerations

The Port of Hood River, as owner/operator of the existing bridge, currently has sole authority in setting toll rates and sole discretion regarding the use of toll proceeds. Since the last toll increase in late 1994, the Port has been depositing 25¢ of each 75¢ toll collected into a bridge repair and replacement (R&R) fund. The remaining 50¢ flows to the Port’s general fund and typically more than covers routine operations and maintenance costs.

A major re-decking of the existing bridge will be necessary in the next several years. This re-decking will be particularly important if there are no bridge replacement plans under consideration. The Port recognizes that this \$7-8 million project is looming, and will likely need to sell bonds to finance part of the cost. Financing will be required as the R&R fund balance totals approximately \$1.2 million, with annual growth approaching \$0.7 million.

For purposes of this financial analysis, it was assumed that commencement of a state-directed replacement project could eliminate the need to do a full re-decking of the existing bridge. If this were the case, lower cost and shorter-term repairs and maintenance could be undertaken in the interim.

**Figure 3
Historical and Proposed Nominal and Real Toll Rates**



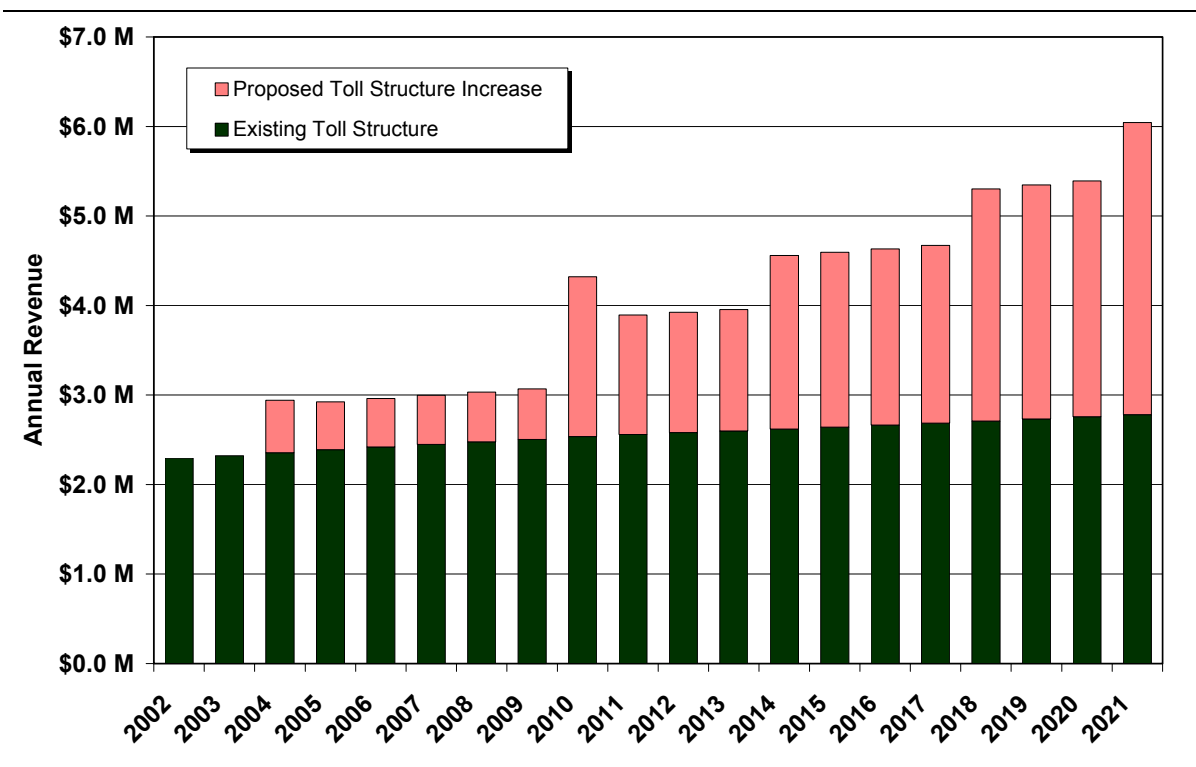
With a toll increase to \$1.00 in 2004, 50¢ of each \$1.00 could be set aside to help fund the capital costs for a new crossing. From 2004 through 2009, these local funds would generate about \$1.5 million in annual revenue, totaling to \$9.0 million plus interest earnings to fund part of the bridge capital investment. This implies that the Port of Hood River could complete interim maintenance and all other necessary short term repair activities on the existing bridge and continue normal operations through 2010 using only the 2003 year-end R&R fund balance (projected to be \$2.7 million) plus the ongoing 50¢ from each standard vehicle toll.

Upon opening of the new bridge, the proposed toll would increase to \$1.75 (equivalent to \$1.50 in 2001 dollars), with periodic inflationary increases at 25¢ intervals to keep the real toll approximately constant. Figure 3 depicts a history of the nominal and real toll rates since 1971, as well as the proposed nominal toll increases and resulting real tolls forecasted out to 2021. Note that at no time is the proposed toll rate higher in real terms than the 50¢ toll was in 1975.

Revenue under Proposed Toll Structure

Figure 4 shows the projected revenue under the current toll structure and the additional revenue that would be generated with the proposed toll policy. The dark bars indicate the revenue generated from the baseline traffic forecast, whereas the lighter bars show the net additional revenue from the higher tolls (and their corresponding lower annual traffic projections).

**Figure 4
Projected Revenue for Existing and Proposed Toll Rates**



Toll Revenue Financing Capacity

Figure 4 indicates that when the new crossing opens in 2010 the annual toll revenue potential is approximately \$4 million. Considering the forecast traffic volume range indicated in Figure 1, the proposed \$1.75 toll in 2010 is expected to yield between \$3.5 and \$4.5 million per year.

A relatively simple financial model was developed to identify the capital investment purchasing potential of toll revenues via the sale of municipal bonds. The model employed the following assumptions:

- 30-year debt via the sale of municipal revenue bonds
- 1.25% issuance cost
- 6.0% interest rate
- Construction duration of 3 years
- Principal payments deferred during construction
- Interest during construction capitalized as a project cost
- 1.2 debt service coverage ratio required

It is expected that toll revenues prior to opening would be insufficient to cover principal payments and all interest payments. As such, it was assumed that interest costs during construction would be capitalized as a project cost—the amount borrowed would be increased by the amount necessary to cover interest payments—and that principal payments would be deferred until after construction. Alternatively, the bond sale could also be structured to capitalize all debt service costs during construction.

Based upon these assumptions, each \$1 million of annual net revenue could finance approximately \$8.8 million of direct capital investment, or about \$10.9 million of project costs including capitalized debt service.

Assuming \$0.5 million for annual operations and maintenance of a new crossing, leaves approximately \$3.5 million as the middle-range of net toll revenues available for debt service. This in turn would leverage approximately \$38 million in net bond proceeds to be used toward project costs. Combined with the funds set aside (\$0.50) from each \$1.00 in tolls paid between 2004 through 2009, the total local funding share from tolls could amount to nearly \$50 million.

It should be kept in mind that the \$1.50 estimated revenue maximizing toll is equivalent to a toll of \$1.75 in 2010, rounded to the nearest quarter. Since this revenue maximizing toll estimate is most likely conservative, it may be reasonable to consider a \$2.00 opening day toll (\$1.75 in today's dollar), which would generate approximately 7-10% more revenue net of its demand impacts.

Annual Revenue Required to Solely Finance a \$150 Million Project

Assuming a project cost of \$150 million in today's dollars, the question may be asked as to what is the equivalent one-way toll, assuming the current traffic volumes, needed to

finance this level of investment. While it is unrealistic to assume that the resulting toll would not cause traffic demand to decrease considerably, such a measure can nevertheless help establish perspective and convey the message that tolls alone cannot finance a project with these characteristics.

A one-way toll of \$5.91, if applied to the 2.98 million one-way bridge trips in 2001 — assuming no demand reaction to the \$5.00 increase in the toll rate — would be equivalent to an annual revenue of \$17.6 million or \$17.1 million net of annual operating and maintenance costs of \$0.5 million. The latter amount would be sufficient to bond \$186 million, of which \$36 million would be used to cover interest and financing expenses during construction, leaving \$150 million for direct capital investment and construction related expenditures.

OTHER LOCAL REVENUE POTENTIAL

Funding Needs

From the financial feasibility analysis, tolls will be sufficient to cover approximately 30-40 percent of the total capital cost of the improvement project. It is assumed that the bridge will need to be funded 50% by state and federal sources, and 50% by local sources (some combination of toll revenues or other local revenue sources). Thus, approximately \$1 to \$2 million annually would need to be raised from local (non-toll) funding sources over the next 20 years to reach the 50 percent local funding level.

Equitable Cost Distribution

Funding a costly project such as this requires sensitivity to political issues, which are in many cases about sharing costs in an equitable or fair way. A fundamental principle of public finance is that people should pay in proportion to the benefits they receive or the costs they impose, unless they belong to a group meriting special treatment. This user-pays principle clearly underlies the use of tolls, but non-toll revenue can also be evaluated from this perspective.

Inter-State Cost Distribution

Survey data shows that most bridge users are from Washington State; the motorist intercept study conducted in October 2001 shows that nearly 72% of respondents and nearly 80% of monthly bridge users are Washingtonians, with all but about 1% of the remainder from Oregon. Washington residents are drawn by the employment opportunities in the Hood River area and the tax free shopping in Oregon. Initially, this would suggest that most of the local funding should come from Washington rather than Oregon, and indeed the toll revenues would.

However, there are two issues that modify this initial assumption. One is that Oregon residents benefit from Washington residents' trips to Oregon, through access to a wider labor pool and a larger consumer market creating increased demand for goods and services. The other is a more practical concern; the Washington study area does not

have as large a funding base as the Oregon study area. Many funding sources are available only to counties, not to cities. Unfortunately, trip patterns do not suggest a benefit that is sufficiently countywide, at least on the Washington side, to warrant a contribution solely from countywide taxes.

The following is a summary of potential local tax options that provide some merit to generate local (non-toll) funding for the bridge replacement.

Washington

One million dollars in annual tax revenue is attainable from some combination of countywide taxes, including a property tax increase to maximum limits, a 0.5% real estate excise tax increase, a 2.3¢ per gallon local option gas tax, a vehicle license fee of \$15, and/or a 0.5% sales tax increase would raise between \$592,000 and \$872,000.

The problem with all of these is that most of the benefit of the new bridge crossing is not countywide. Most of them are rare in Washington (the license fee, the local option gas tax, and the additional real estate excise tax) or impractical for a border county (the additional sales tax).

But if we limit ourselves to the cities of White Salmon and Bingen only, it is impossible to raise \$1 million annually, because of the small economic bases of these small towns. Local options in White Salmon, Bingen, and Klickitat County (and possibly part of eastern Skamania County) could include a combination of a 0.5% real estate excise tax increase; a 0.5% sales tax increase; a property tax increase to the maximum rate allowable; and/or a Port district tax increase.

Oregon

The situation with respect to Oregon is easier, for two reasons. One is that Hood River County is small and the benefits of a new bridge (particularly in terms of the economic activity that would be sustained) could be seen as countywide, more so than in Klickitat County. The other reason is that the City of Hood River has a larger economic and population base than the small cities of southwestern Klickitat County.

Raising \$1 million annually from countywide sources in Hood River County could use a combination of property tax increases up to the maximum level; a local option license fee of \$15; and/or a 3¢ gas tax could generate \$292,000 annually.

One possible combination is a \$0.25 tax increase by the Port, a \$0.25 tax increase by the City of Hood River, and a \$0.50 tax increase by the County. This would generate close to \$1 million annually while keeping tax rates below maximum levels and charging city residents \$1 per \$1000 assessed value compared to \$0.75 for most other county residents.

Summary of Findings

- The revenue maximizing toll has been conservatively estimated at \$1.50 in 2001 dollars. This is equivalent to a toll of \$1.75 in year 2010 dollars, rounded to the nearest quarter.

-
- In 2010, this toll is expected to generate between \$3.5 and \$4.5 million in gross annual revenues before operation and maintenance (O&M) costs. O&M costs are estimated at approximately \$0.5 million per year in today's dollars.
 - The proposed toll structure for financing a new crossing would include increasing toll to \$1.00 in 2004, with 50¢ set aside for capital costs of a new crossing between 2004 and 2010. Increase toll to \$1.75 in 2010 when new crossing opens. Periodically increase toll for inflation in 25¢ increments to maintain a constant real toll.
 - Under the proposed toll structure, toll revenues appear capable of financing upwards of \$50 million in project costs.
 - Each \$1 million of annual net revenue could finance approximately \$8.8 million of direct capital investment, or about \$10.9 million of project costs including capitalized debt service. This helps put perspective on how \$1 million in annual non-toll local revenues can contribute to overall project costs.
 - A tax that charges businesses as well as households, like a property tax, would decrease the household contribution for most households and are the most viable of any local, non-toll financing options.
 - \$1 million in annual tax revenue in Washington is equivalent to \$134 per household per year in Klickitat County. If we limit the revenue requirement to White Salmon and Bingen, \$853 per household would be needed in those two cities. On the Oregon side, raising \$1 million annually requires the equivalent of \$138 per household in Hood River County, or \$412 per household in the City of Hood River.
 - Limited amounts of state and federal funding may be available, but it is unlikely that they will fund the majority of the project cost. Competitive grants that have the highest potential for funding this project include the Washington Transportation Improvement Board (TIB), Oregon Transportation Investment Account (OTIA), federal Enhancement, and federal High Priority Project program.

ENVIRONMENTAL REVIEW

To support the alternatives screening process in Tier II, additional environmental surveys for sensitive plants and cultural resources were performed, tribal coordination was initiated, comprehensive screening criteria were developed, and agency coordination with resource and regulatory agencies was conducted. A summary of these activities is provided below. A detailed description of these activities is provided in Appendix D.

Sensitive Plants

Three federal species of concern were known to potentially occur in or near the project study area: Oregon (or Columbia gorge) daisy (*Erigeron oreganus*), white meconella (*Meconella oregana*), and Barrett's penstemon (*Penstemon barrettiae*). Each is identified as a candidate for state listing by the Oregon Natural Heritage Program (ONHP). Data received from the ONHP identified each of these species in the vicinity of Hood River. No sensitive plants are known to occur in Washington within the study area.

White meconella is the only sensitive plant species known to occur within a corridor being considered in Tier II. A reconnaissance was conducted to verify the presence of this species. In late February 2002, a project biologist did not find any flowering white meconella at Stanley Rock. Flowering time is short for the white meconella and lasts only about one week, typically in late March – early April. The timing of the field visit was probably too early to observe the plant in bloom.

Although there are no known observations of the white meconella on the Oregon side of the East corridor at the potential location of an interchange (which would avoid Stanley Rock), an additional survey would need to be conducted of the preliminary footprint for the interchange, if that option were advanced for further study. Preliminary observations at a potential interchange site do not suggest that suitable habitat is present.

Potentially suitable habitat for Barrett's penstemon exists in the East Corridor on the Oregon side adjacent to I-84. Further observation will be needed at the location of a potential interchange if the East corridor is advanced. Observations also should be made also at the Washington side of the City Center crossing if that corridor is advanced.

The Oregon (Columbia gorge) daisy is typically found in association with overhanging basalt cliffs. Suitable habitat does not appear to occur at any of the crossing locations. No further surveys appear to be needed.

Cultural Resources

Archaeological Investigations Northwest, Inc. (AINW) conducted a cultural resource analysis of the three corridors being studied in Tier II (AINW, 2002). Results of this analysis are summarized below:

- The existing Hood River Bridge would be affected by all of the build alternatives.
- Several linear transportation structures cross within or near the area of potential effect (APE) for all of the corridors and build alternatives. These include railroads and highways on both sides of the Columbia River.
- One prehistoric archaeological resource is within the APE of the Existing corridor along the Washington shore.

-
- Four historic-period houses are within the APE of the East corridor near the intersection of East Steuben Street (SR-14) and Cedar Street in Bingen.
 - Three areas of high potential for retaining archaeological deposits are present: the Washington shores of both the Existing and East corridors and the Oregon shore of the Existing corridor.

Additional field survey and analysis will need to be conducted in Tier III to determine these cultural resources would be impacted and if affected resources would be potentially eligible for listing on the National Register of Historic Places.

Tribal Coordination

Four Native American tribes may have an interest in the SR-35 Study: the Yakama Indian Nation, the Confederated Tribes of the Warm Springs of Oregon, the Confederated Tribes of the Umatilla Indian Reservation, and the Nez Perce of Idaho. Several actions have been taken by the Management Team to gain input and involve the tribes in decisions about the Study, including sending project newsletters, initiating formal consultation by the Federal Highway Administration, and coordinating through WSDOT and ODOT tribal liaisons.

The Management Team is working with the WSDOT Central Region's tribal liaison to share project information with and gather input from the Yakama Indian Nation. Management Team members met on-site with the tribal liaison in March 2002, who then met in-person with tribal representatives. Tribal representatives from the Cultural Program and the Fish and Wildlife Program conducted a field inspection visit in May 2002. The Management Team expects to receive documented findings from this field inspection.

An ODOT liaison has made attempts to involve the Confederated Tribes of the Warm Springs, the Confederated Tribes of the Umatilla Indian Reservation, and the Nez Perce of Idaho. No input has been received from these tribes during Tier II. Further attempts to involve tribal representatives in the project decision-making process will be continued in Tier III.

Critical Environmental Issues

Potential critical issues to the natural and built environments that would be associated with each of corridors are listed below.

City Center Corridor

- Changes in access to the Port of Hood River and consistency with its master plan
- Changes in access to the event center and cruise ship dock.
- Impacts (soils stability and visual) to the Washington shoreline slope to construct an intersection with SR-14.

-
- Direct impacts to wind conditions, windsurfing, and kite boarding on the river; indirect impacts to recreation-based economies.
 - Construction impacts to anadromous and resident fish and habitat.

Existing Corridor

- Right-of-way acquisition of business properties in Hood River.
- Vegetation removal along the Washington shore.
- Construction impacts affecting access to the in-lieu (Native American treaty access) fishing site.
- Disturbance to a potentially significant pre-historic archaeological site.
- Construction impacts to anadromous and resident fish and habitat.

East Corridor

- Exceptions required for four Oregon Statewide Planning Goals to construct an I-84 interchange outside of the urban growth boundary.
- Visual impacts associated with constructing an I-84 interchange outside of the urban areas exempt from the Columbia River Gorge National Scenic Area Management Plan.
- Wetland impacts along the Oregon shore.
- Lack of pedestrian and bicycle connection from new crossing to Hood River.
- Impacts to sensitive nesting habitat.
- Direct and indirect impacts to Bingen Lake, which provides habitat to numerous waterfowl, shorebirds, and predatory birds as well as supports public recreational opportunities.
- Residential displacements in Bingen.
- Construction impacts to anadromous and resident fish and habitat.

Environmental Streamlining

As a bi-state transportation project, the SR-35 Study invokes both the Washington NEPA/SEPA/404 Merger and the Oregon Collaborative Environmental and Transportation Agreement to Streamline (CETAS) environmental streamlining processes. Both processes have formal concurrence points during the NEPA project development stages.

Concurrence on the first two points was requested during Tier II. Copies of the Purpose and Need Statement and Criteria for Alternatives Selection that were submitted for concurrence and a summary of agency response are provided in Appendix D.

In the Washington Merger process, all agencies have concurred with or have waived participation on both points. In the Oregon CETAS process, most agencies have

concluded with both points. However, one non-concurrence was received from the US Fish and Wildlife Service (USFWS) on the Purpose and Need Statement. The ODOT staff that coordinates the Oregon CETAS process is working directly with the USFWS to determine the steps that must be taken to resolve this non-concurrence. Two CETAS agencies, the Oregon Department of Land Conservation and Development (DLCD) and the Oregon Division of State Lands (DSL), have not responded to concurrence requests. ODOT has waived these agencies' participation in the CETAS process. These two agencies will not receive future concurrence requests unless they request to rejoin the project review process.

In Tier III, the Management Team would need to confer with ODOT CETAS and WSDOT Merger representatives to determine how comments should be incorporated into the Purpose and Need and Criteria for Alternatives Selection.

TRANSPORTATION

Background

During Tier I, 20-year cross-river traffic forecasts were made to assist with the evaluation. Since the intent of Tier I was to narrow the list of corridors, rather than focus on specific locations, the transportation evaluation consisted of developing vehicle miles traveled (VMT) projections for cross-river traffic for the various corridors.

During Tier II, more detailed transportation information was developed to assist in the evaluation of these alternatives. Several measures were employed during the alternatives screening to assess transportation considerations: vehicle miles traveled, level-of-service (LOS), safety and accidents, bicycle and pedestrian mobility and proximity to existing and planned facilities, commercial goods mobility, and impacts on Interstate (I-84) and National Highway System (SR-14) facilities.

Six build alternatives were carried forward into the second phase of Tier II. The transportation analysis used to support the alternatives screening is summarized in this section. A detailed analysis is contained in Appendix E.

Forecasts

Two separate forecasts were developed for Tier II:

- Cross-river traffic, based on trends, forecast growth in the study area, and retaining the current toll structure (which assumes that tolls will be raised over time to track with inflation).
- Cross-river traffic, under alternative toll structures – this is reported in the Financial Feasibility Analysis (Appendix C).

During Tier I, using the 1991 Hood River Bridge Origin-Destination (O-D) Study (Intergovernmental Resource Center, 1991), trip tables for cross-river trips were developed for the year 2025. Origins and destinations were generally city limits or

subareas identified in the O-D Study and were considered as traffic zones for this analysis. Cross-river trips were assigned to the roadway network based on the corridor location and the origin and destination traffic zone.

Vehicle Miles Traveled (VMT)

Vehicle miles traveled were calculated by multiplying each trip’s length by the number of trips between traffic zones. For Tier II, the forecasts were updated to the Year 2025 and were based on a composite of the forecast Klickitat and Hood River County growth rates (an average of 1.3 percent per year) and the past 20-year Hood River Bridge traffic trends (an average of 3.9 percent per year). An average three percent annual bridge traffic growth rate resulted and was used for the evaluation, which resulted in a Year 2025 average daily traffic on the crossing of 16,200 vehicles, compared to 7,700 under existing conditions and toll structure (75¢ each way). An adjustment was made for the tunnel option on the City Center corridor, where additional travel distance is necessary due to the tunnel’s profile and the transition from underwater to surface distance.

The Year 2025 VMT table (daily trips) and resultant conflict levels for alternatives by corridor is shown in Table 4.

**Table 4
Vehicle Miles Traveled Summary**

Corridor	Year 2025 VMT	Change from Existing (Low)	Conflict Level
Existing – all alternatives	79,300	N/A	Low
City Center – bridge	94,900	+20%	Moderate
City Center – tunnel	117,200	+48%	High
East – all alternatives	98,900	+25%	Moderate

Level of Service and Intersection/Toll Booth Queuing

Using Year 2025 forecasts factored to an AM and PM peak hour, LOS using Highway Capacity Manual techniques were developed for key intersections in the various alternatives. A traffic simulation model using Synchro/SimTraffic (Version 5, Trafficware Corporation, 2001) was used to examine impacts of queuing on I-84 and intersections along the crossing alternative. High conflict occurs where the projected level-of-service is LOS E/F, and/or if projected queues extend onto the I-84 mainline or through adjacent intersections (significant queuing). Table 5 summarizes the levels-of-service and queuing at key locations under the various alternatives.

Table 5
Year 2025 Peak Hour Level-of-Service and Queuing Summary

Alternative	I-84 Ramps	SR-14 Intersection	Toll Booth
City Center – bridge	LOS C/D, minor queuing	LOS C/D	Moderate queuing
City Center – tunnel	LOS C/D, minor queuing	LOS C/D	Moderate queuing
Existing – fixed span	LOS C/D, minor queuing	LOS C/D	Moderate queuing, potential for spillback into the four-way stop at the Port/retail entrance*
Existing – retrofit	LOS C/D, minor queuing	LOS C/D	Moderate queuing, potential for spillback into the four-way stop at the Port/retail entrance*
East – both fixed span alternatives	LOS B	LOS B	Moderate queuing
No Action	LOS F, significant queuing	LOS C/D	Potentially significant, with queues extending through the adjacent four-way stop at the Port/retail entrance*

*To mitigate the spillback potential, conversion to one-way tolls southbound is suggested.

Bicycle and Pedestrian

This was a composite measure using the vehicle VMT table shown above (assuming it would also apply to cross-river bicycle and pedestrian trips), relative grades at the crossing endpoints (to get onto and off of the crossing), and proximity to bicycle and pedestrian origins and destinations (such as residential neighborhoods, commercial/retail centers, employment centers, and parks). Also, bicycle and pedestrian mobility was evaluated based on the existence or practical addition of those facilities under each alternative. It was assumed that the SR-14 project from the Hood River Bridge to Bingen, which includes a bicycle and pedestrian path, is funded and would be built.

Commercial Goods Mobility

This is a composite measure using the VMT table shown above (assuming it would also apply to cross-river freight and goods trips), relative grades at the crossing endpoints (to get onto and off of the crossing), and proximity to commercial/freight origins and destinations (such as commercial/retail centers, employment centers, and port facilities). Also, commercial goods mobility is based on the lane widths of facilities supporting large loads.

Accidents and Safety

Tier I baseline conditions inventory indicated that there were no identified high accident locations in the study area. Therefore, safety under this evaluation is more of a risk assessment and accident predictive analysis. Risk is based on the potential to increase

the accident rate, using such factors as the number and frequency of traffic stopping, ramp queues, and freeway weaving between interchanges.

Interstate and National Highway System Impacts

I-84 is designated an Interstate Highway by the Federal Highway Administration (FHWA), while SR-14 is classified as a National Highway System route, the second highest classification by FHWA. Impacts to Interstate and National Highway System routes are measured by the change in VMT on these routes by alternative, interchange level-of-service and ramp queuing (see above), and presence of short trips on the facility.

ALTERNATIVES SCREENING

At the beginning of Tier II, the Project Team developed 17 build alternatives within the three corridors (City Center, Existing, and East) recommended from Tier I. These alternatives included crossing facilities such as a new fixed span, movable or floating bridge; a new tunnel; and intelligent transportation system and retrofit options for the existing bridge. New facilities were considered with and without retrofitting the existing bridge specifically for pedestrian and bicycle transportation. A No Action alternative was considered throughout the alternatives screening process.

Criteria were then developed to screen these alternatives for further evaluation in the DEIS.

Criteria

Quantitative measures were applied when data were available. In other cases, qualitative measures based on an impact index were applied, as follows:

- **High impact:** A high level of adverse impacts is likely and mitigation measures to offset the impacts would be extensive, only partially effective, or very expensive.
- **Moderate impact:** A moderate level of adverse impacts is likely and mitigation measures would be feasible or practical with a moderate level of expense.
- **Low impact:** There is a low potential for adverse impacts and little or no mitigation may be necessary.

The evaluation criteria corresponded to the seven objectives contained in the Purpose and Need Statement. Both screenings used similar criteria. The criteria used in the second screening reflect comments received from the Oregon CETAS and Washington Merger streamlining processes, advisory committee input, and public involvement.

Screening

During Tier II, two screening processes were conducted. The first screening narrowed the 17 build alternatives to 6. A summary of this first screening is provided in Appendix F (Table F-1).

The six alternatives that were advanced included:

- City Center Corridor new fixed span bridge for all modes
- City Center Corridor new tunnel with existing bridge retrofit for pedestrian and bicycle use
- Existing Corridor new fixed span bridge for all modes
- Existing bridge retrofit for all modes
- East Corridor new fixed span bridge with existing bridge retrofit for pedestrian and bicycle use
- East Corridor new fixed span bridge for all modes

The No Action alternative was carried forward in all screenings.

With additional financial studies, cost estimates, environmental surveys, transportation analysis, and public input, these six alternatives went through a second screening process. The results are summarized in Table 6. Further details on the screening process are provided in Appendix F (Tables F-2a and F-2b), which include rationale for qualitative ratings.

The second screening narrowed the build alternatives from six to one: the Existing Corridor Fixed Span Bridge for All Modes. However, this alternative was then differentiated into three alternative alignments. The build alternatives are described in the next chapter (Long-Term Alternatives). A No Action alternative will also be evaluated in the DEIS.

**Table 6
Summary of Second Alternatives Screening**

Criteria	City Center Fixed Span Bridge for All Modes	City Center Tunnel with Existing Bridge Retrofit for Peds & Bikes	Existing Fixed Span Bridge for All Modes	Existing Bridge Retrofit for All Modes	East Fixed Span Bridge with Existing Bridge Retrofit for Peds & Bikes	East Fixed Span Bridge for All Modes	No Action
Improve cross-river transportation of people and goods while accommodating standard-width river navigation							
Vehicle miles traveled	M	H	L	L	M	M	L
Travel time and delay (Vehicle-hours)	M	L	M	M	L	L	H
Compliance with roadway geometric standards (Y/N)	Y	Y	Y	Y	Y	Y	N
Compliance with navigation channel guidelines (Y/N)	Y	Y	Y	Y	Y	Y	N
Ability to handle peak traffic episodes	H	H	L	L	L	L	M
Commercial goods mobility (proximity to truck routes, truck trip generators, river navigation) – VMT & travel time	M	H	L	L	M	M	M
Bicycle and pedestrian mobility – Tied to VMT							
Bike commuters	M	L	L	L	L	H	H
Bike other	L	L	L	L	L	M	H
Connectivity to existing or programmed bike/pedestrian facilities	H	L	L	L	L	M	H
Impacts to the natural, built, and aesthetic environment							
Federally listed threatened and endangered fish species and habitat	M	M	M	M	H	M	L
Federally listed threatened and endangered wildlife species and habitat – proximity to bald eagles	L	L	L	L	M	M	L
Other fish, wildlife and plant species and habitat including wetlands	L	M	L	L	H	H	L
Light and glare	M	L	L	L	M	M	L
Noise	M	L	L	L	M	M	H
Plans and policies consistency –							
CRGNSA management plan	L	L	L	L	H	M	L

Criteria	City Center Fixed Span Bridge for All Modes	City Center Tunnel with Existing Bridge Retrofit for Peds & Bikes	Existing Fixed Span Bridge for All Modes	Existing Bridge Retrofit for All Modes	East Fixed Span Bridge with Existing Bridge Retrofit for Peds & Bikes	East Fixed Span Bridge for All Modes	No Action
Oregon statewide planning goals	L	L	L	L	H	H	L
Port master plans	M	M	L	L	L	L	M
Geology	H	H	M	M	M	M	L
Water quality/quantity – storm water runoff, impervious surface, 303(d)	M	M	M	M	H	M	H
Environmental justice – low income and minority populations	L	L	L	L	M	M	N/A
Flood prone areas	L	L	L	L	M	M	L
Indirect and cumulative effects	M	M	L	L	M	M	L
Impacts to Recreation							
Water-based recreation – windsurfing, boating	H	L	L	L	M	M	L
Land-based recreation – bird watching, picnicking, concerts, etc.	M	L	L	L	M	M	L
Park lands	L	L	L	L	H	H	L
Impacts to cultural and historic resources							
Archaeological resources	L	L	H	H	M	M	L
Historic resources	H	H	H	H	H	H	L
In-lieu fishing sites	L	L	M	M	M	M	L
Financially acceptable and supports local economic development							
Cost range without mitigation (Additional costs could include environmental mitigation, ROW acquisition, etc.)	\$106-113 Million	\$350-400 Million	\$110-121 Million	\$137 Million	\$179-192 Million	\$129-142 Million	N/A
Operating and maintenance costs	L	M	L	L	L	L	H
Impacts to local business, economy and economic development	M	M	L	L	M	M	H
Construction impacts	M	M	M	H	L	L	N/A
Home/business displacements	M	H	L	L	M	M	L
Integrity of the Interstate highway system and National Highway System							
Interchange level-of-service	M	M	M	M	L	L	H
Ramp queuing	M	M	M	M	L	L	H
Safety – accident reduction	M	M	M	M	M	M	H

Criteria	City Center Fixed Span Bridge for All Modes	City Center Tunnel with Existing Bridge Retrofit for Peds & Bikes	Existing Fixed Span Bridge for All Modes	Existing Bridge Retrofit for All Modes	East Fixed Span Bridge with Existing Bridge Retrofit for Peds & Bikes	East Fixed Span Bridge for All Modes	No Action
VMT on Interstate or NHS facility	M	L	M	M	M	M	M
ADVANCE THIS ALTERNATIVE TO THE DEIS?							
Management Team Recommendation March 2002	No	No	Yes	No	No	No	Yes
LAC Recommendation May 2002	No	No	Yes	No	No	No	Yes
SC Recommendation May 2002	No	No	Yes	No	No	No	Yes
DOT Regional Administrators' Decision June 2002	No	No	Yes	No	No	No	Yes

RECOMMENDED LONG-TERM ALTERNATIVES

Based on the second alternatives screening process, a new fixed span bridge in the Existing Corridor was recommended. Three alignments were then developed. These alternatives plus the No Action alternative would be carried forward into the DEIS.

All build alternatives consist of a fixed-span bridge as the preferred facility type. The conceptual alignments of the alternatives are shown in Figure ES-2 of the Executive Summary. The three build alternatives are:

- EC-1 West connection to Dock Grade
- EC-2 West Alignment
- EC-3 East Alignment

All alternatives would have a 45-foot wide bridge with a 10-foot bicycle and pedestrian path on one side. The initial configuration would be two 12-foot travel lanes and two 4-foot shoulders. This configuration could be re-stripped to three 12-foot lanes with small shoulders in the future if traffic levels warrant; however, the bridge would need to be widened by five feet to accommodate pedestrian and bicycle travel. The center lane could be made reversible.

Description of Alternatives

All alternatives tie into the existing bridge access road on the south end of the corridor at a point between the toll booth and the four-way stop. Improvements would be made to the I-84 interchange to include signalization or roundabouts at the ramp termini. The four-way stop at E. Marina Way (port/retail entrance) would be converted to a roundabout. The private driveway onto the access road would be closed. In all scenarios, it is assumed that the toll booth will be converted to one-way southbound operations.

The following summarizes additional components of each alternative.

EC-1 West Connection to Dock Grade

This alternative would be directly adjacent to the west side of the existing bridge until a point north of the shipping channel, where it would shift west to avoid the in-lieu fishing site on the Washington side. It would be grade separated from the railroad mainline on the Washington side. The SR-14 intersection at Dock Grade would be signalized and widened to accommodate turn lanes. The grade of SR-14 would need to be raised, and Dock Grade would need to be realigned at the intersection for safety reasons.

EC-2 West Alignment

This alternative would be directly adjacent to the west side of the existing bridge until a point north of the shipping channel, where it would shift slightly to the west to avoid the in-lieu fishing site on the Washington side. It would be grade separated from the railroad mainline on the Washington side. The SR-14 intersection would be signalized and widened to accommodate turn lanes.

EC-3 East Alignment

This alternative would be directly adjacent to the east side of the existing bridge. It would be grade separated from the railroad mainline on the Washington side. The SR-14 intersection would be signalized and widened to accommodate turn lanes.

Cost Estimates for Long-Term Alternatives

Planning-level cost estimates were developed to support the alternatives screening and the financial feasibility analysis. Costs can vary depending on more detailed design work and environmental study and at this point are given a 30 percent “contingency,” which adds 30 percent to the construction cost estimate to account for design scope and other incidental items that could occur. Depending on the bridge design and type, construction costs for Alternatives EC-1, EC-2, and EC-3 are estimated to range from \$110 to \$121 million. This includes design and construction engineering, but does not include the cost of right-of-way acquisition or dislocation/relocation, construction, and environmental impact mitigation. Costs are included for interchange improvements at I-84, intersection improvements at SR-14, and reconstruction of the toll booth to accommodate one-way toll collections.

RECOMMENDED SHORT-TERM AND MID-TERM IMPROVEMENTS

Short-term traffic projections (Year 2005) were developed to examine the need for improvements to maintain traffic operations on the bridge and at the bridge endpoints. Based on this analysis, short-term (within five years) and mid-term (6 to 10 years) improvements were identified. These types of improvements are low-capital cost physical and operational improvements that are needed within the next ten years to maintain or improve traffic operations on the existing bridge. Figure ES-3 of the Executive Summary shows the short-term improvements recommended during Tier II.

Short-Term Improvements

These improvements are:

- Roundabout or traffic signal at I-84 eastbound ramps and Oregon 35/Hood River Bridge access road: This would reduce or eliminate peak traffic episode queuing and spillback onto the I-84 mainline. A roundabout is recommended due to the close proximity of Oregon 35, as well as the offset nature of the eastbound I-84 off- and on-ramps.
- Convert the toll booth to one-way tolls southbound: At peak traffic times, northbound traffic passing through the toll booth spills back through the adjacent four-way stop intersection. This is forecast to be a daily occurrence in the short-term future. In the long-term, these queues could block the I-84 ramp intersections. Converting the toll booth to one-way tolls southbound (\$1.50 toll paid once, rather than \$0.75 paid each way) will eliminate the potential for spillback queues affecting intersection and I-84 traffic operations. In the southbound direction, if queues form, the entire bridge can be used for the queue storage length, which does not impact any adjacent intersection. The one-way tolls should reduce the ongoing operating costs to the Port of Hood River by reducing the number of toll takers needed to operate the toll booth. The short-term conversion would consist of a retrofit of the existing toll booth, minor pavement widening to allow for northbound traffic to flow safely through the toll plaza, and signage changes and removals.
- Bridge replacement fund: A dedicated fund would be established through increased tolls to fund a replacement bridge. In the short-term, these would be collected by the Port of Hood River under an interagency agreement with the Washington State and Oregon Departments of Transportation.

Cost for these improvements are shown below. These costs do not include the cost of right-of-way acquisition nor do they include costs for environmental impact mitigation.

- \$270,000 for the roundabout
- \$100,000 for the toll booth conversion to one-way tolls

-
- \$573,500 total cost for short-term improvements (including additional costs for engineering, construction management, and contingencies).

Mid-Term Improvements

If the replacement of the bridge is not programmed to occur for at least ten years, traffic and congestion growth will result in additional improvements needed to maintain or improve traffic operations on the bridge. The recommended mid-term improvements to the existing bridge include:

- Signalize the I-84 westbound ramps at the Hood River Bridge access road: This would alleviate the future failing level-of-service at the interchange.
- Convert to a roundabout or signalize the four-way stop at the port/retail entrance: The four-way stop, which stops all vehicles, will eventually become a bottleneck and result in traffic spillbacks either into the toll booth area, or into the I-84 interchange area. Additionally, with short-term improvements at the I-84 ramps and at the toll booth to improve traffic flow, having a stop sign in the center of an otherwise flowing corridor may actually increase accidents over time.
- Restrict or close turns at the private driveway onto the Hood River Bridge access road: Vehicles turning left into, or out of, the driveway conflict with bridge traffic. With increased traffic, congestion, and queuing at the toll booth, and the increased potential for accidents, turning movements at the driveway should be restricted at a minimum to right-turns only, and potentially closed if the accident rate increases.
- Toll booth and automated toll collection system: This would alleviate southbound queuing near the toll booth by allowing regular bridge users to use automated toll collection. Project includes removal of current toll booth and the construction of new toll booth, canopy, and communication system to support automated toll collection. The new toll booth would be designed and built so that it would not need to be replaced with the construction of a long-term improvement in this corridor.
- Signalize the SR-14/Hood River Bridge access road intersection: Eventually, this intersection will experience LOS E/F conditions, which could result in higher accident rates as left-turning vehicle drivers become impatient with longer wait times and begin to attempt turns into unsafe gaps in traffic.

Cost for these improvements are shown below. These costs do not include the cost of right-of-way acquisition nor do they include costs for environmental impact mitigation.

- \$160,000 for the traffic signal at the westbound ramps
- \$270,000 for the roundabout at the Port/Retail intersection
- \$20,000 for the turn restriction or closure at the private driveway
- \$750,000 for toll booth and automated toll collection system
- \$160,000 for the signal at SR-14.

- \$2.1 million total cost for mid-term improvements (including additional costs for engineering, construction management, and contingencies).

**Table 7
Implementing Agencies for Short-Term and Mid-Term Improvements**

Improvement	Implementing Agency
<i>Short Term Improvements</i>	
Roundabout or traffic signal at I-84 eastbound ramps and Oregon 35/Hood River Bridge access road	ODOT
Convert the toll booth to one-way tolls southbound	Port of Hood River
Bridge replacement fund	Port of Hood River, with a recommended Interagency Agreement with ODOT and WSDOT
<i>Mid-Term Improvements</i>	
Signalize the I-84 westbound ramps at the Hood River Bridge access road	ODOT
Convert to a Roundabout or signalize the four-way stop at the Port/Retail Entrance	Port of Hood River, coordinating with ODOT on traffic control during construction
Restrict or close turns at the private driveway onto the Hood River Bridge access road	Port of Hood River
Toll booth and automated toll collection system	Port of Hood River (if implemented as part of a long-term alternative, then this would be implemented by the agency(ies) implementing the long-term alternative)
Signalize the SR-14/Hood River Bridge access road intersection	WSDOT

Process to Implement Improvements

Short-term and mid-term improvements would need to be implemented by the agency having jurisdiction over the location being improved (Table 7). The recommended Bridge Replacement Fund would not be initiated and used for short-term improvements, unless the DEIS determines that the preferred alternative is the No Action alternative.

To implement these improvements, both WSDOT and ODOT would need to incorporate the short-term and mid-term improvements into their collective highway system plans

(ODOT: Oregon Highway Plan; WSDOT: Highway System Plan component of Washington's Transportation Plan). Once these documents were amended, funding for ODOT and WSDOT improvements would be sought through the State Transportation Improvement Program (STIP) process.

The Port of Hood River would implement projects through its Transportation Improvement Program or capital budget.

NEXT STEPS

Tier III

Tier III could begin in the summer of 2002 and would include selection of a preferred long-term alternative, completion of the DEIS, and preparation of a financial and implementation plan.

Beyond Tier III

If Tier III is completed, then a Final Environmental Impact Statement (FEIS) would be prepared after the DEIS was circulated to the public. The FEIS would include a response to comments received during the public comment period and any modifications to the design or environmental impact mitigation previously identified in the DEIS, if necessary. After a Record of Decision is issued on the FEIS, preliminary engineering would occur. Funding for the FEIS and preliminary engineering would be sought during Tier III.

DECISION TO CONTINUE STUDY INTO TIER III

A meeting with the WSDOT and ODOT Regional Administrators was held in early June 2002. At this meeting, the Regional Administrators decided to postpone making the decision on whether to continue the Study into Tier III. Further discussions with WSDOT and ODOT will continue for several months. A decision on entering Tier III is expected at the end of Summer 2002. During this interim period, limited public involvement, design, and environmental activities will continue.