Final Report
SR-35 Columbia River Crossing Feasibility Study

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

The SR-35 Columbia River Crossing Feasibility Study was 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 was 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. This tier 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 concluded the Study by selecting a preliminary 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 (PB) was retained by the agencies to lead the technical analysis of the project, supported by Entranco, Cogan Owens Cogan, Zimmer Gunsul Frasca, Archaeological Investigations Northwest, ECO Northwest, and Gilmore Research Group.

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). 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 were formed to advise the project team: a Resource/ Regulatory Committee (RRC) comprised of representatives of state and federal agencies who reviewed 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 met regularly to oversee the Study process.

REPORT PURPOSE

This report is a summary of the SR-35 Columbia River Crossing Study, during which several corridors and alternatives were considered and screened to a practical set of alternatives which were studied during the Draft Environmental Impact Statement (DEIS).

PUBLIC AND AGENCY INVOLVEMENT

The SR-35 Columbia River Crossing study had extensive public and agency involvement activities over the duration of the study. There were two advisory committees in Tiers I and II (Local Advisory Committee and Steering Committee) that were combined into one (SR-35 Advisory Committee) for Tier III. There was a committee of state and federal environmental resource agencies (Resource and Regulatory Committee) that reviewed and commented on the environmental analysis component of the study. Additionally, several newsletters and open houses were held, along with presentations to local groups and organizations.

Summaries of public involvement activities by Tier are described below.

PROJECT PURPOSE AND NEED

A Purpose and Need Statement was developed based on the project team's investigation of current and long-term conditions of the Hood River Bridge, the transportation needs for a new or improved crossing, and public and agency comments.

The **Purpose** of the project is to improve the movement of people and goods across the Columbia River between the Bingen/White Salmon, Washington and Hood River, Oregon communities.

The **Need** for this project is to rectify current and future transportation inadequacies and deficiencies associated with the current Hood River Bridge. Specifically, these needs are to:

- Alleviate current and future congestion at the bridge termini, on the bridge itself and the access road to and from the bridge (SR-35), and congestion related to diverted traffic due to severe weather conditions or incidents on Mount Hood, I-84, or SR-14;
- Provide a cross-river linkage to the transportation system;
- Accommodating the increase in cross-river demand while also providing for bicycle and pedestrian travel across the Columbia River;
- Comply with funding and legislative requirements regarding the SR-35 Columbia River Crossing;
- Satisfy social demands and economic needs for cross-river flow of goods and people;
- Accommodate river navigation by providing a horizontal clearance which meets current standards while also providing intermodal and multimodal connections across the river; and
- Addressing and improving upon safety and current substandard design of the current bridge.

ALTERNATIVES CONSIDERED

The alternatives analysis considered a wide range of corridors and alternatives (see individual Tier summaries below). Alternatives consisted of a new bridge, retrofitting of the current bridge, a combination of a new bridge along with retrofitting of the current bridge for bicycles and pedestrians, and a tunnel.

The preferred crossing corridor is adjacent to the current bridge. The Preliminary Preferred alternative is a new, fixed-span bridge on the immediate west side of the existing bridge. The existing bridge would be demolished and removed.

TIER I

Overview

Tier I included an inventory of existing conditions, an initial set of meetings to summarize issues and options (called the NEPA "scoping" phase), development of a purpose and need statement, and development of a range of alternatives and corridors for further analysis.

A Baseline Conditions Report was completed in November 2000 and updated in January 2001. This report contained information on existing conditions in several categories, including transportation, economy, recreation, the environment, bridge condition, navigation, and river hydraulics.

Issues Identification and Scoping

The range of comments received during the NEPA scoping period included: consideration of impacts on windsurfing; motorist, bicycle, and pedestrian safety crossing the Hood River Bridge and at the intersections of the approach road to the bridge; traffic congestion at the tollbooth and along the bridge access road; impacts on the local economy; impacts to the environment, including tribal fishing sites within the study area; and impacts of tolls on the local economy and financing of a new crossing. Other concerns included impacts of the alternative crossing corridors on the natural environment, park land, threatened or endangered species, land use (especially the Port of Hood River, downtown Bingen, and the Port of Klickitat), the Columbia River Gorge National Scenic Area, and specific local businesses and recreation areas.

The project Purpose and Need Statement was drafted prior to the scoping period to explain why the project was being undertaken by the Federal Highway Administration (FHWA), the lead federal agency for the study. After the scoping period, the Purpose and Need Statement was refined to reflect comments from the public and resource agencies. The Purpose and Need Statement was based on the project team's investigation of current and long-term conditions of the Hood River Bridge, the transportation needs for a new or improved crossing, and public and agency comments.

Corridor Evaluation and Recommendations

The project team conducted an initial corridor screening in May 2001. Screening criterion was developed in accordance with technical expertise, the Purpose and Need Statement and public and agency comments. Baseline information available on a corridor level was used as the basis for this screening, and corridors were screened for their potential to have high, moderate, or low impacts associated with each criterion. The results are presented in the Recommendations chapter of the Tier I report, which was published in August 2001.

Evaluation criteria were developed based on the project objectives contained in the Purpose and Need statement. They are:

- Meet current standards for river navigation if any new facility is constructed;
- Avoid or minimize impacts to the natural, built, and aesthetic environment;
- Avoid or minimize impacts to recreational users and facilities;
- Be financially acceptable and support economic development;
- Avoid or minimize impacts to cultural and historical resources; and
- Maintain the integrity of the Interstate Highway System.

The result of the evaluation and public process is to recommend that the following corridors be carried forward:

- City Center
- Existing with “Low Elevation” Crossing
- East “A”
- No-Action (current bridge retained as an alternative for comparative purposes).

Eliminated corridors were:

- West
- Existing with “High Elevation” Crossing
- East “B”

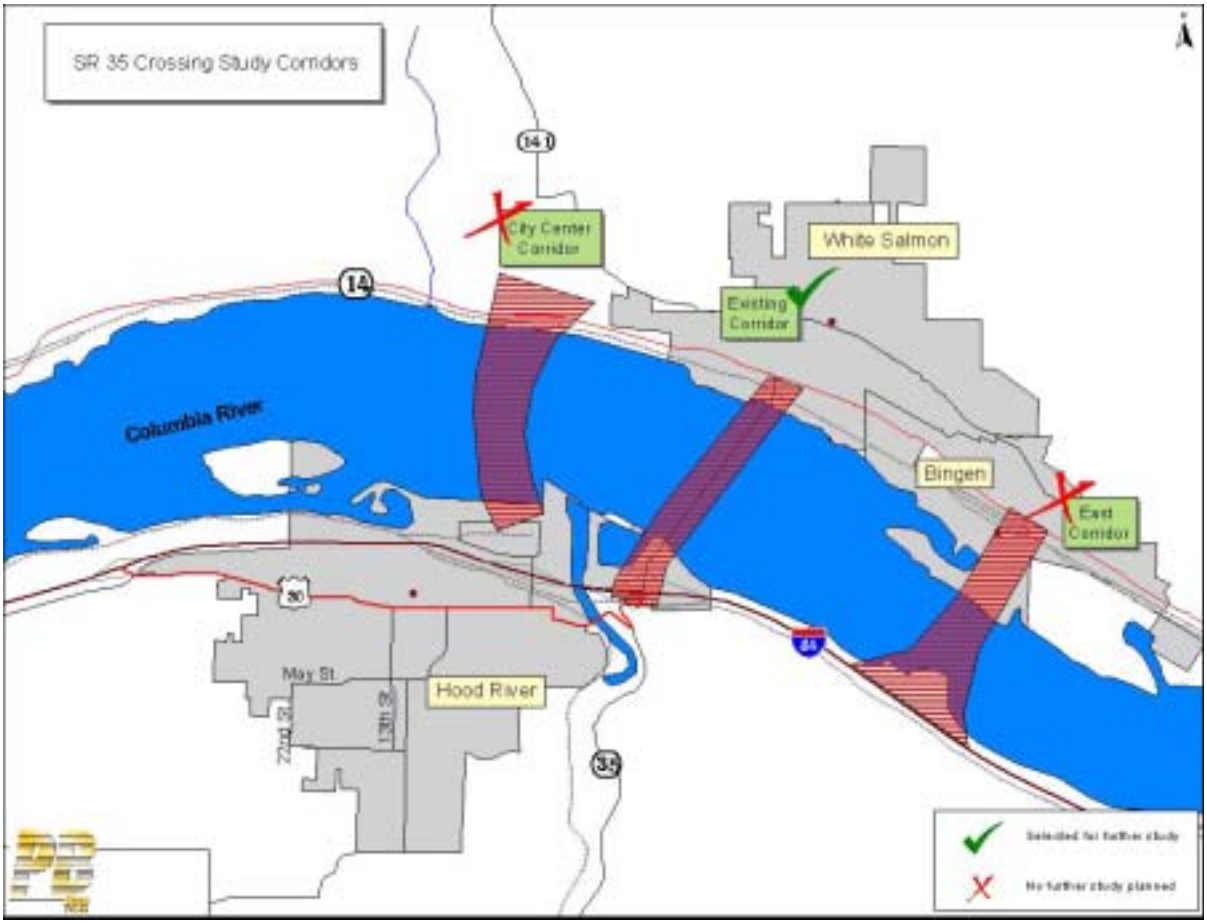
Additionally, the following facility types were carried forward for analysis in Tier II:

- Short Term Improvements to the Existing Bridge
- Tunnel (various types) at the City Center Corridor
- Floating or movable bridge
- Fixed span bridge.

TIER II

Tier II analyzed short- and long-term solutions, refinement and evaluation of crossing alternative, and selection of a corridor for the development of alternatives which were evaluated in the DEIS. A financial feasibility analysis was also conducted during Tier II. The crossing corridors considered during Tier II are illustrated in Figure ES-1.

Figure ES-1. Map of Tier II Corridors



Public Involvement

Tier II public and agency involvement included meetings of the advisory committees, two public open houses, a random sample telephone survey and motorist intercept survey of bridge users, newsletters, a youth bridge design contest, and 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. A bridge design workshop was also conducted during Tier II.

Bridge Design

A bridge design workshop was held with stakeholders, local agency and citizen representatives, and members of the Gorge Commission during Tier II in January 2002. Several bridge types and design treatments were discussed and developed during the workshop. The participants generally agreed on a low-key bridge design with an arch above the navigation channel. Illumination on the bridge, if provided, would be low-level to minimize glare and provide what was necessary for pedestrian, bicyclist, and motorist safety and security.

Figure ES-2 shows the bridge cross-section type, while Figure ES-3 shows renderings of the bridge design type across the Columbia River.

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 summarizes the cost estimates. Costs for right-of-way acquisition and environmental mitigation were 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 indicated that tolls over time, with periodic increases, could provide as much as $40-50 million toward the overall cost of the project (approximately 30-40 percent of the total cost). The study also determined that the remainder of the funding needs should come from a variety of local, state, and federal funding sources.

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 environment were identified for each corridor. These critical issues were then assessed 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.

Figure ES-2: Bridge Cross Sections

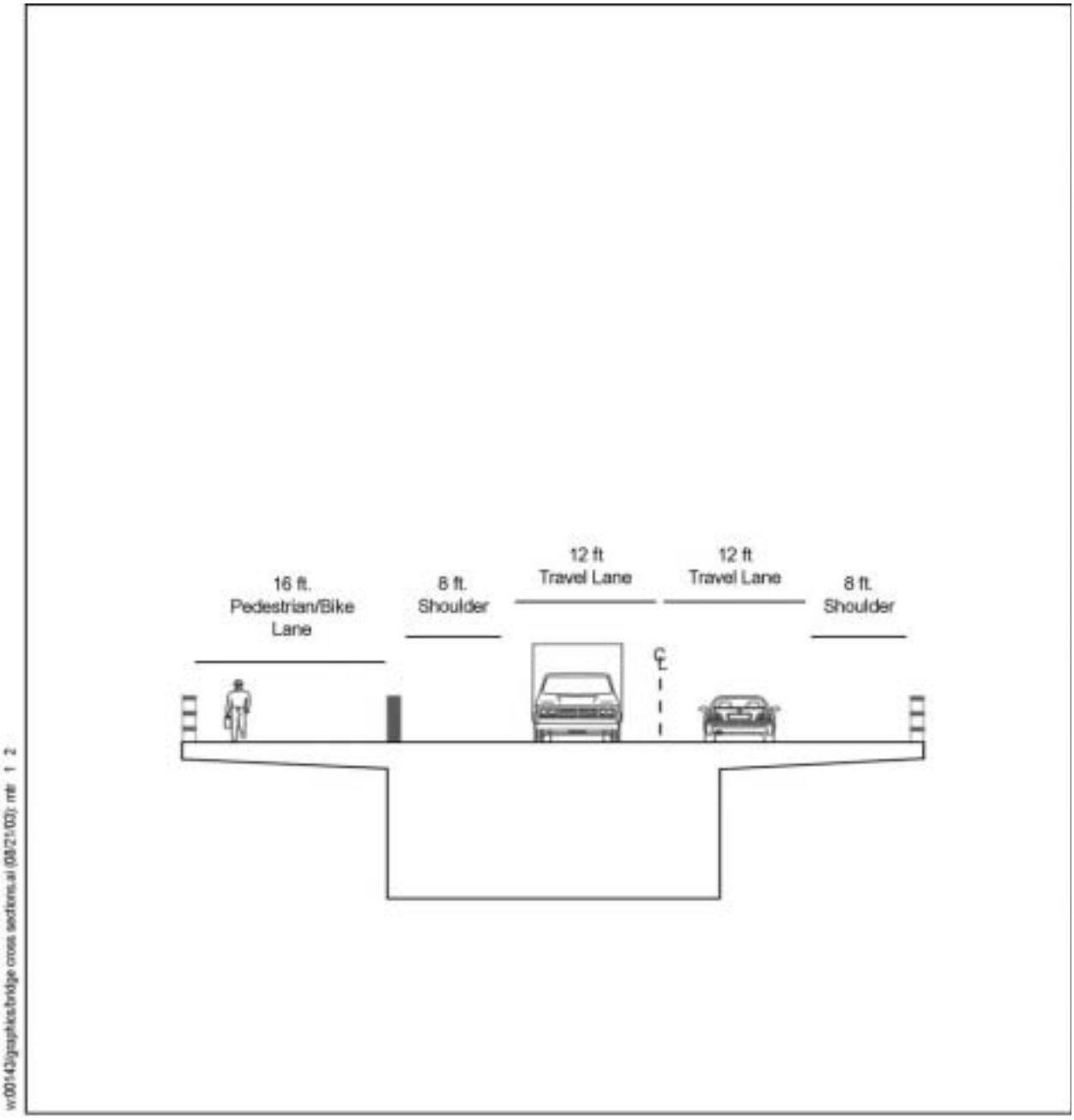
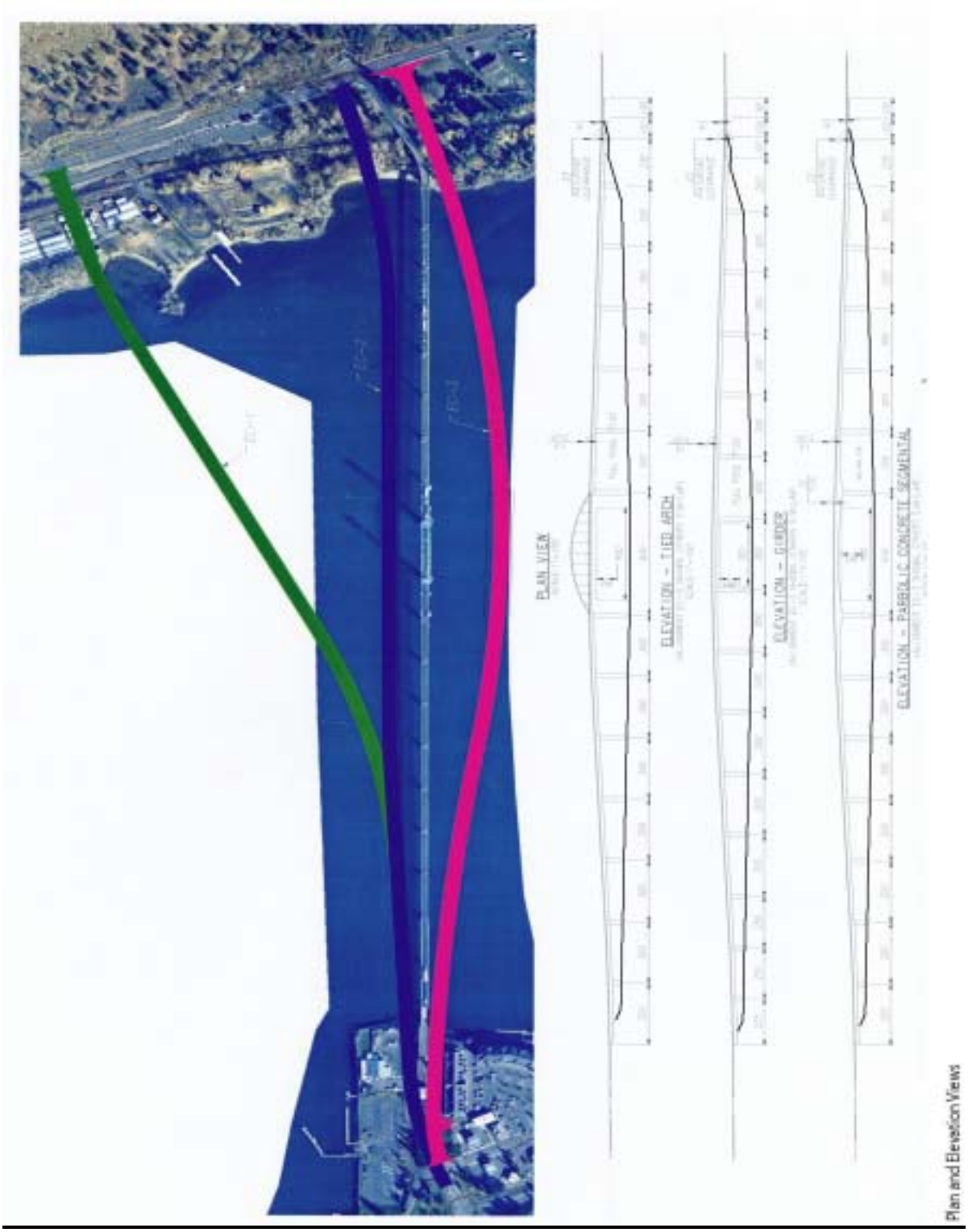


Figure ES-3: Bridge Design Type



Short-Term and Mid-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 was recommended due to the close proximity of Oregon 35, and due to the eastbound I-84 off- and on-ramps being offset from each other.

- *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 was forecasted 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) would eliminate the potential for spillback queues affecting intersection and I-84 traffic operations. In the southbound direction, if queues form, the entire bridge could 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 WSDOT and ODOT.

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 (LOS) 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

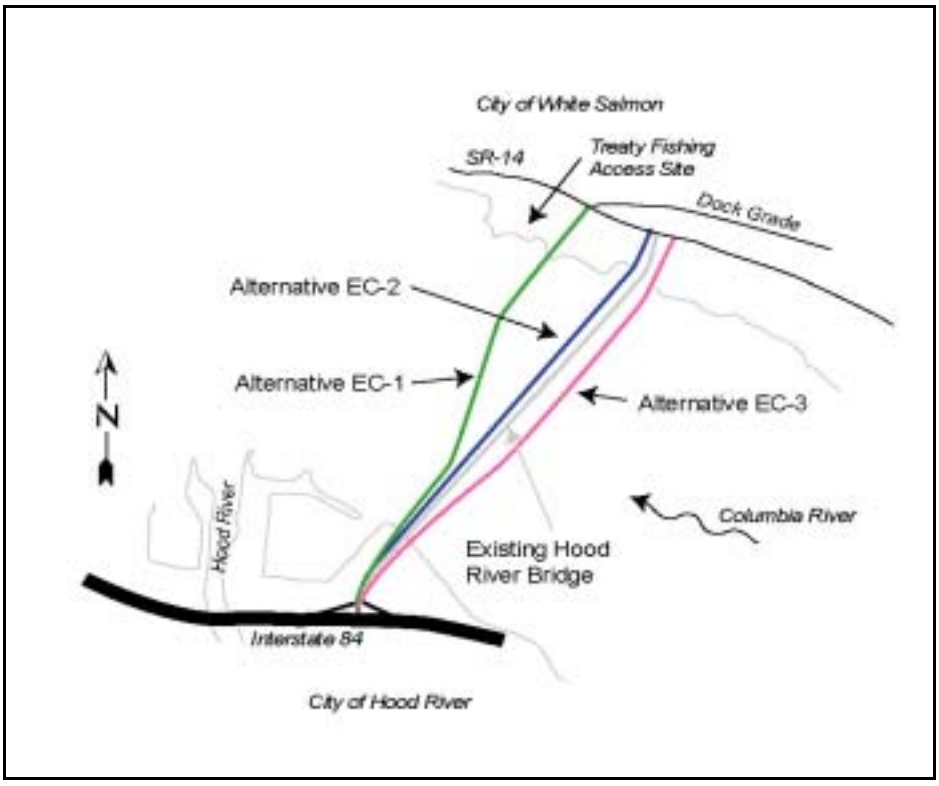
toll both, canopy, and communication system to support automated toll collection. The new toll booth would be designed and built so that it would not need to be replaced with the construction of a long-term improvement in this corridor.

- *Signalize the SR-14/Hood River Bridge access road intersection*: WSDOT is currently installing a signal at this intersection.

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 criterion was 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. 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-4.

Figure ES-4: Map of DEIS Alignments



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 East 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 would be converted to one-way operations.

The alternatives were narrowed to three "DEIS crossing alternatives" which were considered during Tier III. There were three "build" alternatives. In addition, a no-action alternative was carried forward from Tier II and was one of the DEIS alternatives considered. 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 of the Columbia River. 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. To accommodate the additional traffic, Dock Grade would need to be widened to provide standard lane widths and shoulders up the bluff into White Salmon.

- *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 east 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.

TIER III

Tier III resulted in the selection of a preliminary preferred alternative, publishing of the DEIS, completion of work scopes to conduct preliminary engineering and the final environmental impact statement (FEIS), determination for the Hood River Bridge's eligibility for listing on the National Register of Historic Places, and roundabout analysis for the I-84 ramp intersections with the bridge access road and Oregon 35. Alternative EC-2 was selected as the preliminary preferred alternative in the DEIS.

Public Involvement

Tier III included continuation of public and agency involvement activities. The two advisory committees were combined into the SR-35 Advisory Committee and met three times. The Resource and Regulatory Committee met once and were escorted on a field visit of the corridor by the SR-35 project team. The DEIS open house and public hearing were held.

Environmental Review and Coordination

To support the alternative evaluation in Tier III (DEIS), additional environmental data collection was performed and technical reports written for the DEIS alternatives, tribal coordination was continued, comprehensive evaluation and selection criteria were developed, and agency coordination with resource and regulatory agencies was conducted. From these activities,

potential impacts and mitigation issues to the environment were identified for each alternative. This evaluation was documented in the DEIS.

Tribal coordination was undertaken in all three Tiers, but a more concerted coordination effort was undertaken in Tier III. Efforts were made to contact the four tribes (Yakama Nation, Confederated Tribes of Warm Springs, Confederated Tribes of the Umatilla Reservation, and Nez Perce Tribe) during Tier III. Representatives from WSDOT met at the project site with the Yakama Nation to discuss the tribes' interests.

As a bi-state transportation project, the SR-35 Study invokes both the Washington NEPA/SEPA/404 Merger (Signatory Agency Committee or SAC) and the Oregon Collaborative Environmental and Transportation Agreement to Streamline (CETAS) environmental streamlining processes. Concurrence on the DEIS alternatives was obtained during Tier III.

Alternatives Analysis and Recommendations
An alternatives evaluation was conducted during Tier III which consisted of using the potential impacts information described in the environmental technical reports, along with public and agency input, to evaluate the DEIS alternatives and select a preliminary preferred alternative. The SR-35 Management Team selected a preliminary preferred alternative in the summer of 2003, and a public hearing and open house was held in January 2004 to receive public comment on the DEIS. Public support for the project was received and there was no significant public opposition.

The preliminary preferred alternative (Alternative EC-2), as described in the DEIS, is the course of action that the lead agencies have preliminarily determined to be most desirable in terms of balancing functional efficiency and environmental, social, and economic effects. This selection of a Preliminary Preferred alternative is preliminary and subject to revision. The final evaluation and selection of a preferred alternative will be based on the outcome of the FEIS and any other pertinent information that may become available. Comments and information that would assist in such an evaluation are encouraged.

Environmental Consequences
The SR-35 project has environmental impacts, but has a number of benefits over the existing bridge. These were detailed in the Draft Environmental Impact Statement. The following is a summary of the environmental consequences of the Preliminary Preferred alternative.

Environmental *impacts* are summarized below. Mitigation for all impacts is summarized in the DEIS.

- Occasional road closures and business disruptions due to construction of the new bridge and approach roads,
- Impacts to river navigation while the bridge structure over the navigation channel is being built,
- A small risk of erosion during construction (that would be mitigated by implementing an erosion control plan during construction),
- Increased snow removal efforts and potential use of de-icing materials on the bridge which would need to be treated in the stormwater facilities,

- Some right-of-way acquisition and closure of several driveways,
- Removal of the current bridge (which has been determined as eligible to be listed on the National Register of Historic Places),
- Potential impacts to archaeological sites during construction,
- Some vegetation, wetlands and wildlife impacts during construction and operations,
- Potential impacts on in-river habitat due to bridge piers and illumination, and
- Visual impacts of having a new bridge.

Environmental *benefits* are based on comparison to the No-Build alternative and include:

- Alleviation of significant traffic congestion and ramp queuing on the bridge and approach roads, and with that improved fuel efficiency and reduced air pollution,
- Providing a wider navigation channel that meets current standards,
- Bicycle and pedestrian facilities would be provided across the Columbia River where none currently exist,
- The weight/load restriction on trucks would be removed, enhancing cross-river transportation of goods,
- Improvement to water quality and removal of direct, untreated stormwater runoff into the Columbia River which is experienced with the current bridge,
- Economic benefits by accommodating cross-river bicycle and pedestrian travel, improved goods flow, and road capacity to accommodate long-term growth,
- Fewer bridge piers in the water may reduce habitat for predatory fish compared to the current bridge.

Funding and Implementation Plan

A funding and implementation plan was prepared which outlined how the bridge project could be funded and completed over time. Using potential toll revenue from the Tier II Financial Feasibility Study, along with a summary of existing and potential future revenue and funding sources, a preliminary recommended funding strategy was developed. The strategy is based on a projected $200 million total cost (in 2004 dollars). This recommended Plan provides for full funding for construction over three successive federal transportation funding reauthorization periods (three five-year acts: 2004 to 2009, 2009 to 2014, and 2014 to Bridge opening) and successive Oregon and Washington state funding acts. This funding strategy be monitored and updated after each step is achieved to identify changes in funding resources and outlook, timelines, and jurisdiction or project responsibility. The following summarizes the Funding and Implementation Plan, which is divided into three time periods which coincide with federal transportation reauthorization periods:

Short Term

1. Increase the toll by 25 cents immediately and establish a dedicated and restricted Bridge Replacement Fund.

2. Complete the Final Environmental Impact Statement and Preliminary Engineering (PE), assuming efforts to secure the necessary $800,000 of federal funding with $200,000 local match are successful.

3. Install a traffic signal at SR-14 and the Bridge Access Road.

4. Program and install the I-84 ramp/bridge access road intersection improvements (preferably roundabouts but signalization is still an option).

5. Convert toll booths to one-way toll southbound and automate toll collections (timeline is 2006 to 2008).

Medium Term

In the 2009 to 2014 federal funding authorization, seek funds for the final design, permitting, and right-of-way acquisition for the bridge replacement through the High Priority or Large Project program. This could be allocated over the five or six years of the next federal Surface Transportation Act. Timelines are expected as follows:

1. Final design: 2009 to 2011

2. Right-of-way plans and acquisition: 2010 to 2012

3. Permitting: 2011 to 2012.

4. Seek federal earmark for $12 million to $16 million

5. Local match from Bridge Replacement fund (toll receipts) of $3 million to $6 million

At this point in the timeline, the Congressional delegations of each state should coordinate on seeking federal funding for the construction phase of the project. Additionally, local state legislators should begin their work to seek earmarks in updates of the state highway funding packages in both Oregon and Washington for major portions of the local match for the construction phase.

Long Term

The toll revenue is expected to pay upwards of 40 percent of the construction cost, estimated at $170 million to $180 million expressed in 2004 dollars. This is approximately $60 million to $80 million of the total cost. Approximately $50 million to $60 million in Federal funds should be sought from a variety of sources (High Priority or Major Projects programs, Enhancement, Bridge Rehabilitation) in the 2014 to 2018 federal Transportation Act.

The remaining $40 to $60 million in funding needs could come from a variety of local and state funding resources, the majority of which could come from future updates of the Oregon and Washington state highway funding packages, of which $25 million should be sought from each state for a total of $50 million. The balance of funding could come from a variety of local funding sources, such as the Klickitat County Landfill account, local option taxes in White Salmon, Bingen, and Hood River; contributions from the Port of Hood River, and other funding sources.

Demolition of the existing bridge, estimated to cost approximately $5 million, could be deferred to a later phase if funding is insufficient to include that effort.

Oregon and Washington federal Enhancement programs could pay for the multi-use path construction on the bridge and on the bridge approaches and access roads, as well as viewpoints identified in the Columbia Gorge Commission's March 2004 design workshop.

Figure ES-5 presents a timeline of activities from today through bridge construction and existing bridge demolition and Figure ES-6 summarizes the approximately funding percentages by source.

Figure ES-5: Implementation Plan Flow

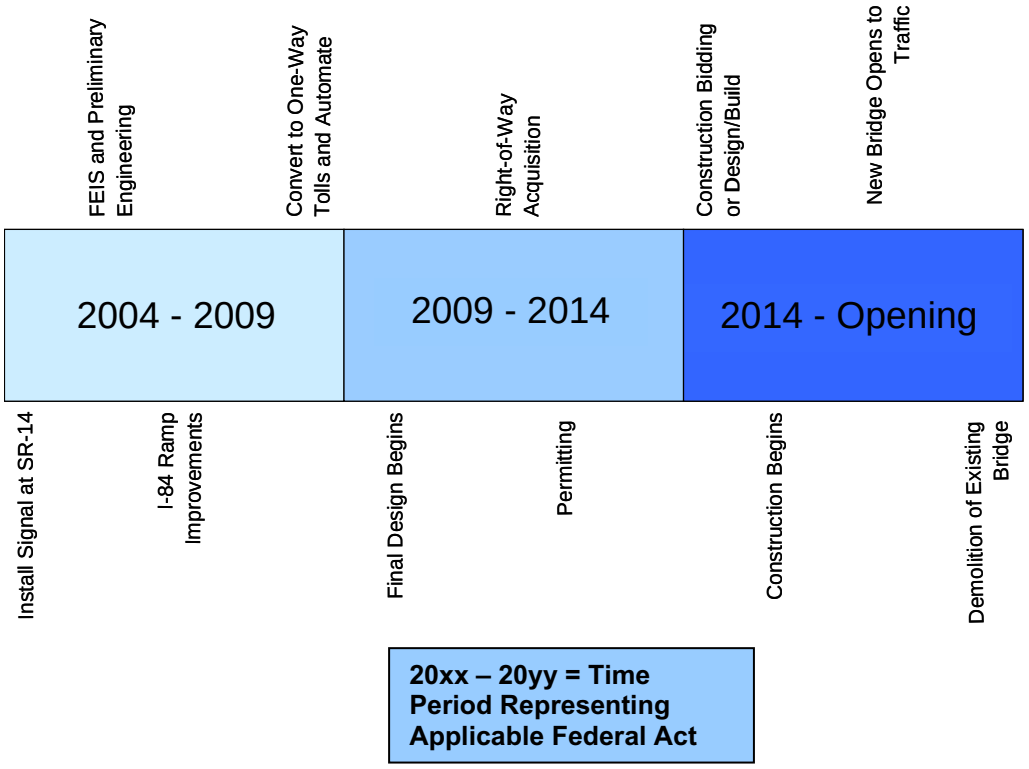
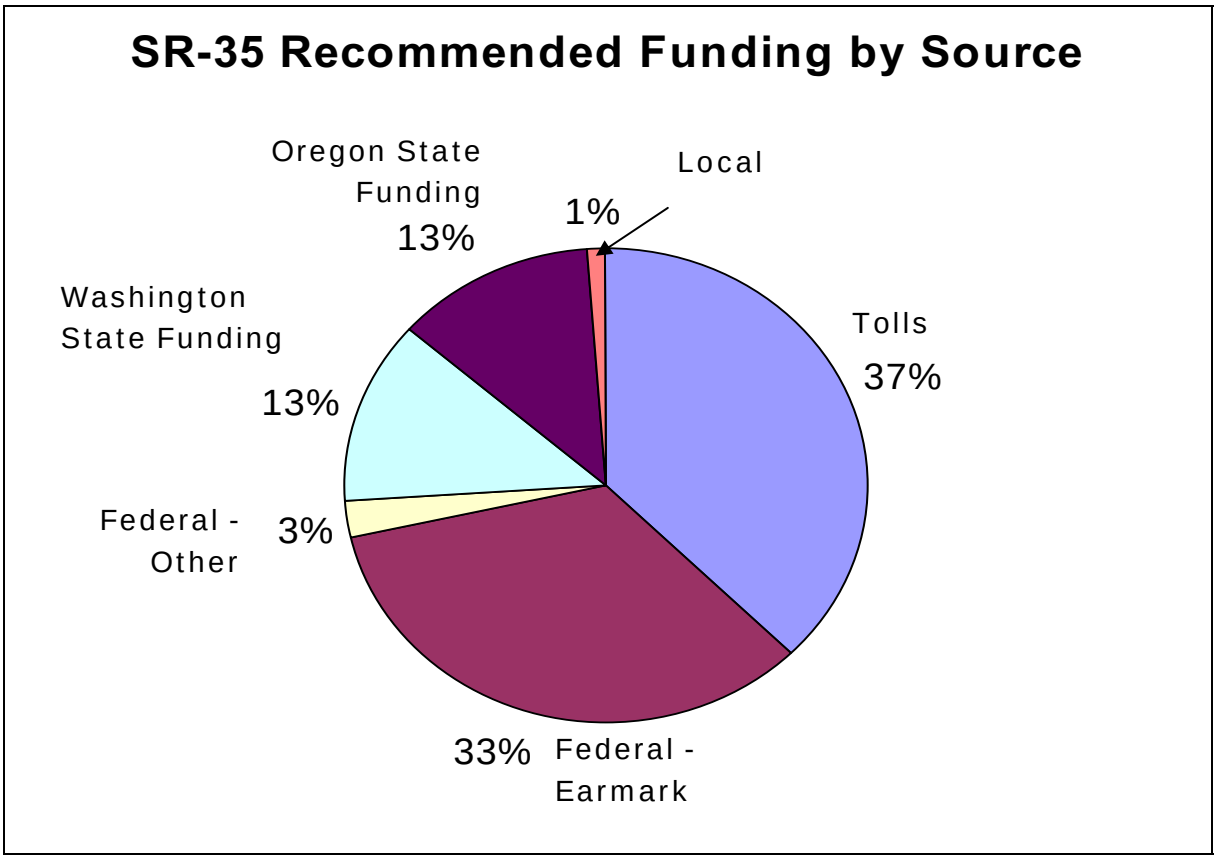


Figure ES-6: Recommended Funding by Source



HISTORICAL SIGNIFICANCE OF THE HOOD RIVER BRIDGE

An assessment was conducted and recommended that the Hood River Bridge is eligible for listing on the National Register of Historic Places. Furthermore, the assessment concluded that the removal of the bridge would have an adverse effect on the historic structure. The DEIS assumed the existing bridge would be historically significant.

Proposed mitigation measures include some level of photographic and structural documentation be prepared in accordance with the Historic American Engineering Record (HAER) specifications. This documentation would be completed prior to demolition.

ROUNDABOUT ANALYSIS

The purpose of the Roundabout study was to prepare an in-depth review and analysis of roundabouts at the I-84 interchange with the bridge access road. Several future alternative scenarios were considered and a comparison drawn to the "No-Build" scenario for this analysis. The options included "No-Build", intersections with signals, and roundabouts at the Interstate Highway 84 and State Route 35 (I-84/SR-35) interchange. Highway capacity analysis was conducted using micro-simulation models and corroborated with Highway Capacity Software-2000 (HCS-2000) analyses.

A micro-simulation roundabout model was developed using VISSIM, a widely used tool for preparing transportation analyses including roundabouts. Two consecutive roundabout operations were studied in detail using both simulation and the FHWA's analytical methodology.

From the analysis of traffic for the SR-35 Hood River Bridge study area in 2025, the recommended concept consists of urban roundabouts at the ramp termini and with the West Marina Drive/retail access road. Figure ES-7 details the design assumptions for the two roundabouts. To alleviate queuing at the eastbound ramp terminus, a potential "flare" or widening could be added at the intersection throat to allow for two vehicles to simultaneously enter the roundabout (one to turn southbound toward Button Junction, the other to travel around the roundabout to go northbound).

The roundabouts show acceptable levels-of-service and queuing at both I-84 intersections for the year 2025 peak periods. "No-build" or signalized intersection approaches will have operations at or near capacity and queues that will extend onto the I-84 mainline in the short-term future. It is recommended that the retail entrance be combined with the westbound off-ramp into a composite roundabout. This is the best option due to the close proximity of this intersection to the westbound I-84 ramps. The geometry of the two intersections will not allow feasible operations if both intersections are signalized.

SCOPE OF WORK FOR NEXT PHASES: PRELIMINARY ENGINEERING AND FINAL ENVIRONMENTAL IMPACT STATEMENT

A scope of work for the next phase of the project has been developed, although it is not funded. It consists of four major tasks:

- Complete environmental technical work including a biological assessment, respond to public comments, and FEIS, and coordinate with the Oregon and Washington environmental streamlining committees (CETAS and SAC processes) to obtain preferred alternative concurrence in the FEIS and the mitigation plan.

- Complete Preliminary Engineering design and cost estimate to approximately a 30 percent level to support permitting and grant applications; develop final design elements including an architectural design to meet visual and Gorge Management Plan requirements; conduct detailed Geotechnical, Hydraulic and wind load analyses; develop right-of-way plans; achieve design acceptance by ODOT, WSDOT, the Gorge Commission, and other key agencies; and develop a statement of work for Final Design.

- FEIS outreach should include efforts to meet in-person with representatives of each tribe. In addition the project team should utilize any formalized or regular meetings that ODOT holds with the Warm Springs to discuss transportation projects as well as continuing to coordinate with WSDOT and ODOT tribal liaisons. Previous attempts, such as letters and telephone calls, to obtain comments from the tribes were not overly successful. So the focus needs to involve the team traveling to each tribe and meeting in-person to establish a dialogue about the project.

- Tribes will also continue to be consulted during the on-going section 106 process. As the area of potential effects (APE) is established, the tribes will have an opportunity to comment. Depending on the results of the archaeological surveys conducted for the FEIS, the tribes will likely be involved in the findings of those surveys, effects to the resources, and any needed mitigative strategies.

- Update traffic modeling results if the design year (2025) changes; consider different intersection design, such as a roundabout, at the terminus of the bridge at SR-14, and provide traffic forecasts relevant to revenue forecasts to support financing.

- Determine whether to use an advisory committee (recommended); assuming a committee is used, conduct up to three meetings with the committee to review, comment and advise on bridge design issues, results of additional environmental analysis, and other public outreach activities; prepare and distribute two or three newsletters or fact sheets about the project; conduct two or more public workshops or hearings to review the results of the FEIS and preliminary design recommendations with at least one meeting focusing on design issues; meet or communicate with agency representatives regarding specific issues of concern; and coordinate with tribal organizations.

STUDY PUBLICATIONS

The SR-35 Study produced the following documents that are referenced in this report:

- Baseline Transportation Conditions: January 2001

- Environmental Study Plan: February 2001

- Tier I Final Report: July 2001

- Public Opinion Survey Report: December 2001

- Financial Feasibility Study Report: June 2002

- Tier II Final Report: July 2002

- SR-35 Columbia River Crossing Draft Environmental Impact Statement: December 2003.

- SR-35 Columbia River Crossing Financial and Implementation Plan (July 2004)

- SR-35 Columbia River Crossing Scopes of Work for Preliminary Engineering and Final Environmental Impact Statement (May 2004)

- Assessment of the National Register of Historic Places Eligibility – Hood River to White Salmon Bridge: June 2004.

- SR-35 Traffic and Roundabout Analysis: July 2004.

FINAL REPORT

INTRODUCTION

The SR-35 Columbia River Crossing Feasibility Study was 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 concluded the Study by selecting a Preliminary 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 by Entranco, Cogan Owens Cogan, Zimmer Gunsul Frasca, Archaeological Investigations Northwest, ECO Northwest, and Gilmore Research Group.

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 were formed to advise the project team: a Resource/ Regulatory Committee (RRC) comprised of representatives of state and federal agencies who reviewed 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 met regularly to oversee the Study process.

REPORT PURPOSE

This report is a summary of the SR-35 Columbia River Crossing Study, during which several corridors and alternatives were considered and screened to a practical set of alternatives which were studied during the DEIS.

PUBLIC AND AGENCY INVOLVEMENT

The SR-35 Columbia River Crossing study had extensive public and agency involvement activities over the duration of the study. There were two advisory committees in Tiers I and II (Local Advisory Committee and Steering Committee) that were combined into one (SR-35 Advisory Committee) for Tier III. There was a committee of state and federal environmental resource agencies (Resource and Regulatory Committee) that reviewed and commented on the environmental analysis component of the study. Additionally, several newsletters and open houses were held, along with presentations to local groups and organizations.

Table 1 summarizes the public and agency involvement activities over the SR-35 study's duration.

Table 1: Public and Agency Involvement Activities

Date	Activity
TIER I	
August 2000	Media Release announcing start of Phase 2
September 2000	Project newsletter, volume 1
October –November 2000	Media Release announcing October 12 open house
	Resource and Regulatory Committee Meeting
	Stakeholder Interviews: Summary of Key Findings
	Public Open House
	Combined Local Advisory/Steering Committee Meeting
February - June 2001	Media Release announcing February, 2001 advisory committee meetings
	Public Scoping Public Notice paid advertisement for local newspapers
	Combined Local Advisory/Steering Committee Meeting
	Project newsletter, volume 2
	Media release announcing opening of public scoping period
	Public Open House, March 8, 2001: Summary of Comments
	Media Release; April, 2001
	Resource and Regulatory Committee Meeting, March 8, 2001: Minutes
	Local Advisory Committee Meeting, May 3, 2001: Meeting Highlights
	Steering Committee Meeting, May 17, 2001: Meeting Highlights
	Project newsletter, volume 3

TIER II	
July –December 2001	Media release announcing narrowing of alternatives
	Media release announcing September, 2001 advisory committee meetings
	Media release announcing October 11, 2001 public open house
	Local Advisory Committee Meeting, September 13, 2001: Meeting Highlights
	Steering Committee Meeting, September 20, 2001: Meeting Highlights
	Media release announcing public opinion survey
	Public Open House, October 11, 2001: Summary of Comments
February – June 2002	Combined Local Advisory/Steering Committee/ community representatives SR-35 Design Workshop, January 28, 2002; workshop summary
	Media release announcing February 28, 2002 public open house
	Project newsletter, volume 4
	Resource and Regulatory Committee Meeting, March 5, 2002: Minutes
	Public Open House, February 28, 2002: Summary of Comments
	Media release announcing May 20, 2002 advisory committee meeting
	Combined Local Advisory/Steering Committee Meeting, May 2, 2002: Meeting Highlights
	Media release announcing pending decision on Tier 3 of study
	Project newsletter, volume 5
TIER III	
November 20, 2002	Combined Local Advisory/Steering Committee Meeting, November 7, 2002: Meeting Highlights
February 13, 2003	Resource and Regulatory Committee Meeting and Field Visits, February 13, 2003: Minutes
March 24, 2003	Combined Local Advisory/Steering Committee Meeting, March 24, 2003: Meeting Highlights
May 2003	Project newsletter, volume 6
May 5, 2003	Media release announcing May 15, 2003 advisory committee meeting
May 15, 2003	Public Open House, May 15, 2002: Summary of Comments
January 22, 2004	DEIS Public Hearing and Open House
March 11, 2004	Final Advisory Committee Meeting

TIER I

Overview

Prior to Tier I, a first phase of the SR-35 Columbia River Crossing effort was completed in 1999, resulting in vision and mission statements for the study and these possible crossing locations:

- Stanley Rock (East A Corridor): connecting Koberg State Park to Bingen Point.
- Existing Low Corridor: approximately the same alignment as the existing bridge.

- Existing High Corridor: approximately the same alignment as the existing bridge but at a much higher elevation, connecting from Button Junction to Jewett Boulevard (SR-141).

- West Hood River Interchange (West Corridor): connecting on I-84 at or near the West Hood River interchange across the Columbia River to SR-14 at a point near the Fish Hatchery west of White Salmon.

Tier I of the study developed an understanding of the potential benefits and drawbacks of a new or improved crossing, short- and long-term recommendations for improvements, an environmental document, and an implementation strategy.

During Tier I, two additional corridors were added for consideration:

- City Center Corridor: connecting the Hood River City Center/I-84 interchange with a point in Washington on SR-14 approximately ½ mile west of the existing bridge.

- East B Corridor: located approximately ½ mile east of the East A Corridor and connecting I-84 east of Koberg Park with a location on the east side of Bingen.

A Steering Committee of elected and appointed officials and senior staff and a Local Advisory Committee of citizens and business representatives were formed to help guide the study. In addition, throughout the project, residents and business owners on both sides of the Columbia River had opportunities to be involved through community events, questionnaires, newsletters, a youth project, public displays and other means.

ALTERNATIVES ANALYSIS

Project Purpose and Need

The range of comments received during the NEPA scoping period included: consideration of impacts on windsurfing; motorist, bicycle, and pedestrian safety crossing the Hood River Bridge and at the intersections of the approach road to the bridge; traffic congestion at the tollbooth and along the bridge access road; impacts on the local economy; impacts to the environment, including tribal fishing sites within the study area; and impacts of tolls on the local economy and financing of a new crossing. Other concerns included impacts of the alternative crossing corridors on the natural environment, park land, threatened or endangered species, land use (especially the Port of Hood River, downtown Bingen, and the Port of Klickitat), the Columbia River Gorge National Scenic Area, and specific local businesses and recreation areas.

A project Purpose and Need Statement was drafted prior to the scoping period to explain why the project was being undertaken by the Federal Highway Administration (FHWA), the lead federal agency for the study. After the scoping period, the Purpose and Need Statement was refined to reflect comments from the public and resource agencies. The Purpose and Need Statement was based on the project team's investigation of current and long-term conditions of the Hood River Bridge, the transportation needs for a new or improved crossing, and public and agency comments.

The **Purpose** of the project is to improve the movement of people and goods across the Columbia River between the Bingen/White Salmon, Washington and Hood River, Oregon communities.

The **Need** for this project is to rectify current and future transportation inadequacies and deficiencies associated with the current Hood River Bridge. Specifically, these needs are to:

- Alleviate current and future congestion at the bridge termini, on the bridge itself and the access road to and from the bridge (SR-35), and congestion related to diverted traffic due to severe weather conditions or incidents on Mount Hood, I-84, or SR-14;
- Provide a cross-river linkage to the transportation system;
- Accommodating the increase in cross-river demand while also providing for bicycle and pedestrian travel across the Columbia River;
- Comply with funding and legislative requirements regarding the SR-35 Columbia River Crossing;
- Satisfy social demands and economic needs for cross-river flow of goods and people;
- Accommodate river navigation by providing a horizontal clearance which meets current standards while also providing intermodal and multimodal connections across the river; and
- Addressing and improving upon safety and current substandard design of the current bridge.

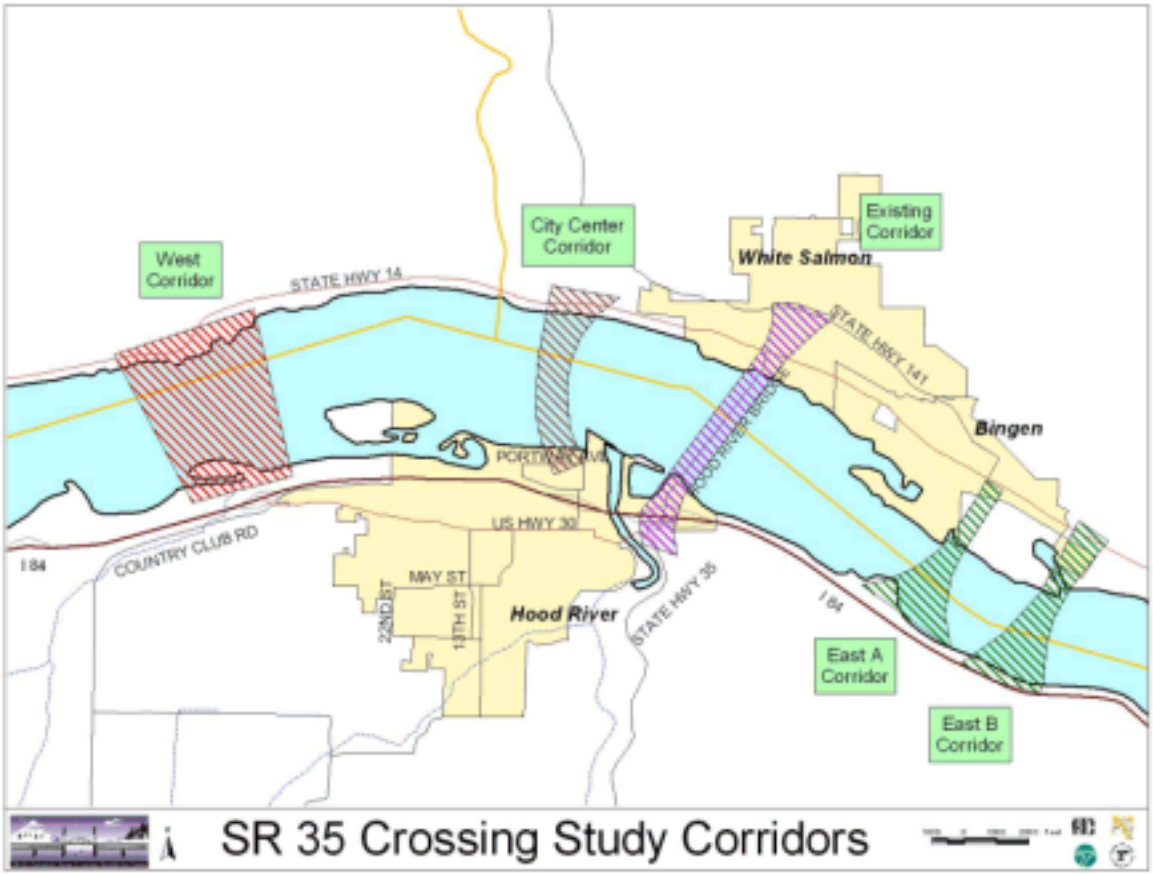
Corridor Screening

A corridor is defined as an area, up to 1000 feet wide, that connects I-84 or a proximate point in Oregon to SR-14 or a proximate point in Washington. There are six crossing corridors that were studied. These corridors include the corridor where the Hood River Bridge is located and five new crossing options identified from agency and public involvement process. The corridors are illustrated in Figure 1.

Preliminary baseline conditions were inventoried for these corridors in order to begin the process of identifying reasonable and practical alternatives that satisfy transportation needs of the Study and meet other project objectives, such as accommodating river navigation and minimizing impacts to the environment. In Tier I of the Study, corridors were screened based on a broad range of criterion, including transportation, economic, environmental (built and natural), recreation, and cultural/historical impacts. The following sections define the criterion used, the results of the screening, and recommendations for carrying specific corridors forward in the Study for further consideration.

Based on the recommendations of the corridor screening, a range of alternatives were developed (Tier II activity). Each alternative included a specific crossing location within the corridor and a facility (a subsequent section in this report describes preliminary facility options that were considered). A No Action alternative was included in the range of alternatives and contained currently funded and programmed projects in the study area, including maintenance work on the existing Hood River Bridge.

Figure 1: SR-35 Crossing Study Corridors



Criteria and Scoring

Each corridor was screened based on criteria that reflected the project purpose, needs and objectives. The No Action alternative is also included in the screening. Results of the detailed corridor screening are shown in Table 2.

Based on corridor-level information, each corridor was scored for the level of potential conflict with each criterion (listed in Table 2) as follows:

- High conflict: A high level of adverse impacts is likely and mitigation to offset the impacts would be infeasible or impractical.
- Moderate conflict: A moderate level of adverse impacts is likely and mitigation is feasible or practical, but may be expensive to provide.
- Low conflict: There is a low potential for adverse impacts and little or no mitigation may be necessary.

Table 2: Detailed Corridor Screening

	Corridors						
Criteria: Potential to conflict with the following purposes for the project:	**West**	**City Center**	**Existing Low**	**Existing High**	**East A**	**East B**	**No Action**
Improve cross-river transportation of people and goods while accommodating standard-width river navigation	ậ	ắ *	ấ *	ậ	ắ	ậ	ậ
Vehicle miles traveled	ậ	ắ	ẩ	ắ	ắ	ậ	ẩ
Bicycle and pedestrian mobility	ậ	ắ	ấ	ậ	ắ	ậ	ậ
Commercial goods mobility	ậ	ắ	ẩ	ậ	ắ	ậ	ắ
Accommodate river navigation	ắ	ắ *	ắ *	ắ	ắ	ắ	ậ
Minimize impacts to the natural, built, and aesthetic environment	ậ	ắ *	ắ *	ậ	ậ	ậ	NA
Federally listed threatened and endangered fish species and habitat	ậ	ậ *	ậ *	ậ	ậ	ậ	NA
Federally listed threatened and endangered wildlife and plant species and habitat	ẩ	ẩ	ẩ	ẩ	ậ	ậ	NA
Other fish, wildlife and plant species and habitat	ắ	ắ	ắ	ắ	ậ	ắ	NA
Visual resources	ậ	ắ *	ắ *	ậ	ậ	ậ	ắ
Land use consistency	ậ	ắ	ẩ	ậ	ắ	ậ	ẩ
Minimize impacts to recreation activities	ậ	ậ *	ấ *	ẩ	ậ	ậ	ẩ
Water-based recreation	ậ	ậ *	ắ *	ấ	ắ	ậ	ắ
Land-based recreation	ắ	ắ *	ẩ	ẩ	ậ	ậ	ẩ
Minimize impacts to cultural and historical resources	ậ	ắ	ắ **	ắ	ẩ	ẩ	ẩ
Be financially acceptable and support local economic development	ậ	ậ	ắ	ậ	ắ	ậ	ắ
Cost of project	NA	NA	NA	NA	NA	NA	NA

	Corridors						
Criteria: Potential to conflict with the following purposes for the project:	**West**	**City Center**	**Existing Low**	**Existing High**	**East A**	**East B**	**No Action**
Impacts to local business	ậ	ậ	ắ	ậ	ắ	ậ	ắ
Maintain the integrity of the interstate highway system	ẩ	ẩ	ẩ	ẩ	ậ	ậ	ẩ
Should the corridor be considered further in the project development?	**No**	**Yes**	**Yes**	**No**	**Yes**	**No**	**Yes**

ǒ = High conflict; ắ = Moderate conflict; ʒ = Low conflict; NA = Not applicable

*Conflicts would be less for a tunnel facility option

**Conflicts would be higher for a tunnel facility option

Recommendations

Table 3 summarizes the results of the corridor screening.

Table 3: Summary of Corridor Screening

	Corridors						
Criteria: Potential to conflict with the following purposes for the project	**West**	**City Center**	**Existing Low**	**Existing High**	**East A**	**East B**	**No Action**
Improve cross-river transportation of people and goods while accommodating standard-width river navigation	ậ	ắ *	ẩ *	ậ	ắ	ậ	ậ
Minimize impacts to the natural, built, and aesthetic environment	ậ	ắ *	ắ *	ậ	ậ	ậ	NA
Minimize impacts to recreation activities	ậ	ậ *	ấ *	ấ	ậ	ậ	ấ
Minimize impacts to cultural and historical resources	ậ	ắ	ắ **	ắ	ẩ	ẩ	ẩ
Be financially acceptable and support local economic development	ậ	ậ	ắ	ậ	ắ	ậ	ắ
Maintain the integrity of the interstate highway system	ẩ	ẩ	ẩ	ẩ	ậ	ậ	ẩ
Should the corridor be considered further in the project development?	**No**	**Yes**	**Yes**	**No**	**Yes**	**No**	**Yes**

ǒ = High conflict; ắ = Moderate conflict; ʒ = Low conflict; NA = Not applicable
*Conflicts would be less for a tunnel facility option
**Conflicts would be higher for a tunnel facility option

Based on these results, the following recommendations are offered to focus study and resources on the corridors with the most promising ability to meet the Study's purpose, needs and objectives.

West Corridor: Recommended to be eliminated from further consideration due to high impacts associated with most criteria, including potential impacts associated with the environment.

City Center Corridor: Recommended to be carried forward for further consideration. It is noted that potential impacts to recreation, especially to water-based activities, may be high and potential impacts to the environment may be moderate.

Existing Low Corridor: Recommended to be carried forward for further consideration due to this corridor having fewer potential impacts relative to the other corridors.

Existing High Corridor: Recommended to be eliminated from further consideration due to potential high impacts to the environment combined with a high/moderate conflict with the transportation purpose for the project.

East A Corridor: Recommended to be carried forward for further consideration. It is noted that potential impacts to recreation (especially to land-based activities) may be high, potential impacts to the environment may be moderate, and connection to the interstate system may require a new access point.

East B Corridor: Recommended to be eliminated from further consideration due to high impacts associated with most criteria, including potential impacts associated with the environment.

No Action Alternative: Recommended to be carried forward throughout project development as required by NEPA.

In summary, the following corridors were recommended for further analysis in Tier II:

- City Center
- Existing with "Low Elevation" Crossing
- East A
- No Action (existing bridge included for comparative purposes).

Facilities

A variety of facility types were also studied. These ranged from ferries to person-based modes (tramway, for example) as well as vehicular (tunnel and bridge). Listed below is the summary of the facility type evaluation. Facility types recommended for further analysis in Tier II include:

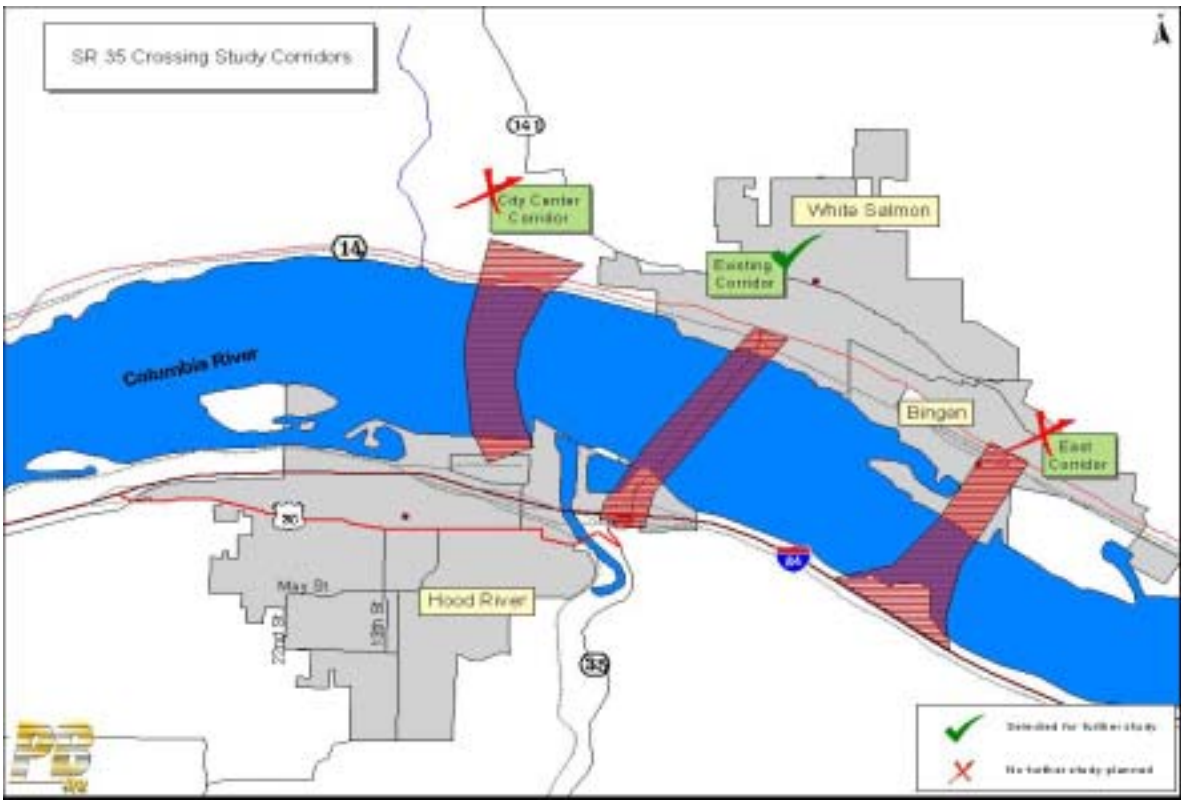
- Short-term Improvements to the Existing Bridge
- Tunnel (various types) at the City Center Corridor
- Floating or movable bridges
- Fixed span bridges.

TIER II

Overview

Tier II included 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. The crossing corridors considered during Tier II are shown in Figure 2.

Figure 2: Map of Tier II Corridors



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.

Gilmore Research Group was commissioned to study public opinion about the need for a new crossing to replace the current SR-35 Bridge and related issues. This research was conducted in two stages with two methodologies: intercept interviews with 255 bridge users and a telephone survey of 400 adult residents of the Hood River-White Salmon-Bingen area. Findings from the two stages of research are complimentary and were similar.

Motorist Intercept Findings

The majority of those intercepted (88 percent) believe that there is a need for a new crossing. Almost two-thirds (63 percent) of the 255 motorists intercepted believed there was a great need for a new crossing. One-quarter (25 percent) said there was somewhat of a need for a new crossing, and only 10 percent said there was not much or no need at all for a new crossing.

Only 12 percent said they would not have made their current trip (or did not know) if the toll was more than the current 75 cents. Approximately nine-in-ten (88 percent) said they would be willing to pay $1.00. Just under two-thirds (62 percent) indicated they would be willing to pay $1.50. Approximately 50 percent of all those intercepted said they would still have made their current trip if the one-way toll was $2.00.

All motorists intercepted were asked how likely they would have been to make their current trip on foot or by bicycle, if sidewalks or bike lanes were available and the toll were reduced or free. Most of the respondents (71 percent) indicated that they were unlikely to cross the bridge as a pedestrian or bicyclist even if such facilities were available on the improved crossing. Fourteen percent (14 percent) said they would be very likely to do so and 13 percent said they would be somewhat likely.

Motorists were asked for the community (or nearest community) of their destination. The most common destination was Hood River (32 percent) followed by White Salmon (21 percent). The most commonly mentioned trip purpose was shopping or personal business--such as a haircut, banking, or medical appointment (37 percent), followed by recreation or leisure activities (20 percent) and commute to work or school (18 percent).

Motorists intercepted for the study were asked to recall the number of trips they had made across the bridge in the past seven days, counting travel in each direction as a separate trip. The average user crosses the bridge more than once a day. The mean number of trips was 9.1, while the median was 8.0. Those preferring a new crossing 3/4 mile east of the current location also reported a significantly higher number of trips (mean 12.2 trips) than those favoring a new crossing at the same location (7.8 trips) and those favoring a new crossing 1/2 mile west of the current bridge (9.7).

Local residents (in local zip codes) accounted for 60 percent of those intercepted while non-local motorists accounted for 40 percent. Those motorists who felt there was a great need for a new crossing were most likely to be local residents. Of those who thought there was a great need for a new crossing, 69 percent were local residents; among the group who felt there was somewhat, not much, or no need at all for a new crossing, just 48 percent were local residents. Local residents were significantly more likely to prefer a new crossing 3/4 mile east of the existing bridge over the other two alternatives; they accounted for 73 percent of those preferring a new crossing 3/4 mile east of the current location. By contrast locals accounted for 66 percent

of those favoring a new crossing 1/2 mile west of the current location, and 51 percent of those favoring a new crossing in the same location as the existing bridge.

Telephone Survey Findings

Of the 400 respondents contacted in the telephone survey, most felt there was some need for a new or improved crossing (84 percent). This percentage is similar to the results of the intercept survey of bridge users. Approximately 6 in 10 (61 percent) said there was a great need for a new crossing, 23 percent felt there was somewhat of a need for a new crossing, and 16 percent said not much of a need or no need at all or did not know.

Of the three methods, user tolls paid at the crossing were most preferred (44 percent) by survey respondents, followed by combination of user tolls and taxes (25 percent) and local taxes--such as property and/or sales taxes (8 percent). A number of respondents (15 percent) found none of three options acceptable.

Respondents who had taken one or more trips across the bridge in the past week were asked if they would still have made their most recent trip if the one-way toll had been higher. Only 23 percent would not have been willing to make their most recent trip if the one-way toll were more than the existing 75-cents. Just over three-quarters (77 percent) would still have made their most recent trip if the one-way toll had been $1.00. About half (48 percent) would pay $1.50, and a little over one-third (38 percent) would pay $2.00. These results are very similar to those from the Intercept survey.

While the idea of a higher toll was acceptable to a substantial proportion of bridge users, the idea of additional taxes on top of the existing 75-cent toll was not as popular with area residents. Only 17 percent of all survey respondents were willing to pay $20 per month with the existing toll, just under one-quarter (22 percent) would pay $15 per month, and just over one-third (35 percent) would pay $10 per month.

Respondents who reported making a trip across the bridge in the past week were asked how likely they would have been to make any of their trips on foot or by bicycle, if sidewalks or bike lanes were available and the toll were reduced or free. Eleven percent (11 percent) said they would have been very likely to do so, 9 percent said they would be somewhat likely, 15 percent said not very likely, 63 percent said not at all likely, and 1 percent said don't know.

Considering most recent trip purpose, the most commonly mentioned was shopping or personal business, such as a haircut, banking, or medical appt. (43 percent), followed by commute to work or school (16 percent), business travel as part of job (16 percent), recreation or leisure activities (12 percent), visiting friends or relatives (10 percent), and other purposes (1 percent).

All survey respondents were asked to recall the number of trips they had made (either as driver or passenger) across the bridge in the past seven days, counting each direction as a separate trip. The mean number of trips was 6.1, while the median was 4.0. Thirty-one percent (31 percent) of the randomly selected respondents reported no trips at all in the past week; this is lower than for the intercept survey. Among those who did travel across the bridge in the past week, the mean number of one-way trips was 8.5 and the median was 6.0, results much closer to those observed in the intercept study. Washington residents reported significantly more bridge usage in the past week (mean 9.9 trips) than Oregon residents (2.3 trips). Those who preferred taxes to finance a new crossing reported significantly greater bridge usage (mean 13.1 trips) than those preferring tolls (5.1 trips) and those preferring a combination of tolls and taxes (7.0 trips).

The suggestion for higher weekend tolls did not find much support, with only 29 percent of all survey respondents saying they somewhat agree or strongly agree with the idea and 68 percent saying strongly disagree or somewhat disagree. However, Oregon residents were more likely to somewhat/strongly agree with the proposal for higher weekend tolls than Washington residents (34 percent versus 25 percent). The suggestion of lesser tolls for pedestrians and bicyclists on a new crossing was quite popular. Most of those surveyed (82 percent) said they somewhat or strongly agree with the idea.

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 were included for engineering, construction management, and contingency to arrive at a total project cost. Table 4 summarizes the cost estimates. Costs for right-of-way acquisition and environmental mitigation are not included.

Table 4: 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 2001 dollars.
- The proposed toll structure for financing a new crossing would include increasing toll to $1.00 in 2004, with 50¢ set a side 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 is 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 the revenue requirement is limited 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 corridor. These critical issues were then assessed 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 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 (Signatory Agency Committee or SAC) 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 SAC process, all agencies concurred with or waived participation on both points. In the Oregon CETAS process, most agencies concurred with both points. However, one non-concurrence was received from the US Fish and Wildlife Service (USFWS) on the Purpose and Need Statement. ODOT staff that coordinates the Oregon CETAS process worked directly with the USFWS 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), did not respond to concurrence requests. ODOT 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, safety and accidents, bicycle and pedestrian mobility and proximity to existing and planned facilities, commercial goods mobility, and impacts on 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

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 5.

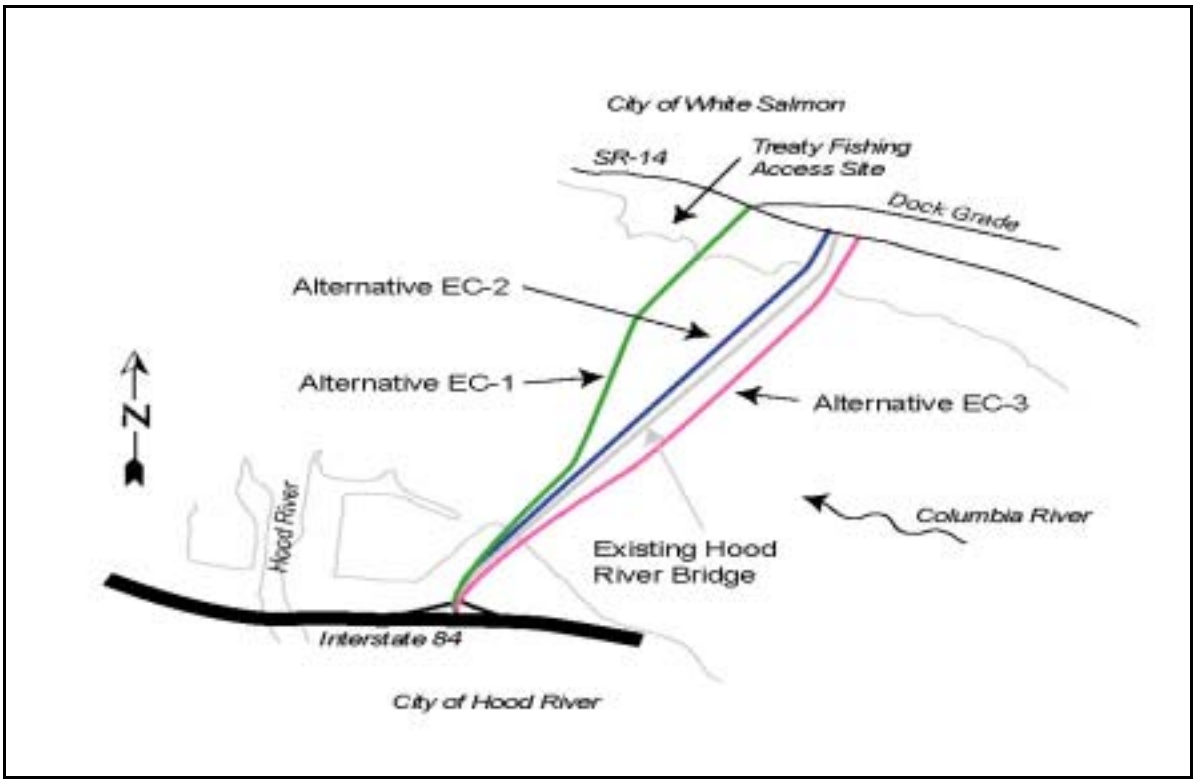
Table 5: Summary of Rationale to Advance or Eliminate Alternatives

Corridor	Alternative	Recommendation for Further Study	Reason
City Center	New fixed span bridge for all modes	Eliminate	∉ 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	∉ 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	∉ 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	∉ Identical low impacts as existing new fixed span, except it has higher capital costs and higher construction impacts.

Corridor	Alternative	Recommendation for Further Study	Reason
East	New fixed span bridge with existing bridge retrofit for pedestrian and bicycle use	Eliminate	∉ 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	∉ 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.

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 3.

Figure 3: Map of DEIS Alignments



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 East 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 was assumed that the toll booth would 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 of the Columbia River. 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. To accommodate the additional traffic, Dock Grade would need to be widened to provide standard lane widths and shoulders up the bluff into White Salmon.

- *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 east 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.

Bridge Design – Long-Term Improvements
A bridge design workshop was held with stakeholders, local agency and citizen representatives, and members of the Gorge Commission during Tier II in January 2002. Several bridge types and design treatments were discussed and developed during the workshop. The participants generally agreed on a low-key bridge design with an arch above the navigation channel. Illumination on the bridge, if provided, would be low-level to minimize glare and provide what was necessary for pedestrian, bicyclist, and motorist safety and security.

Figure 4 shows the bridge cross-section type, while Figure 5 shows renderings of the bridge design type across the Columbia River.

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.

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 WSDOT and ODOT.

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 both, 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.

Figure 4: Bridge Cross Section

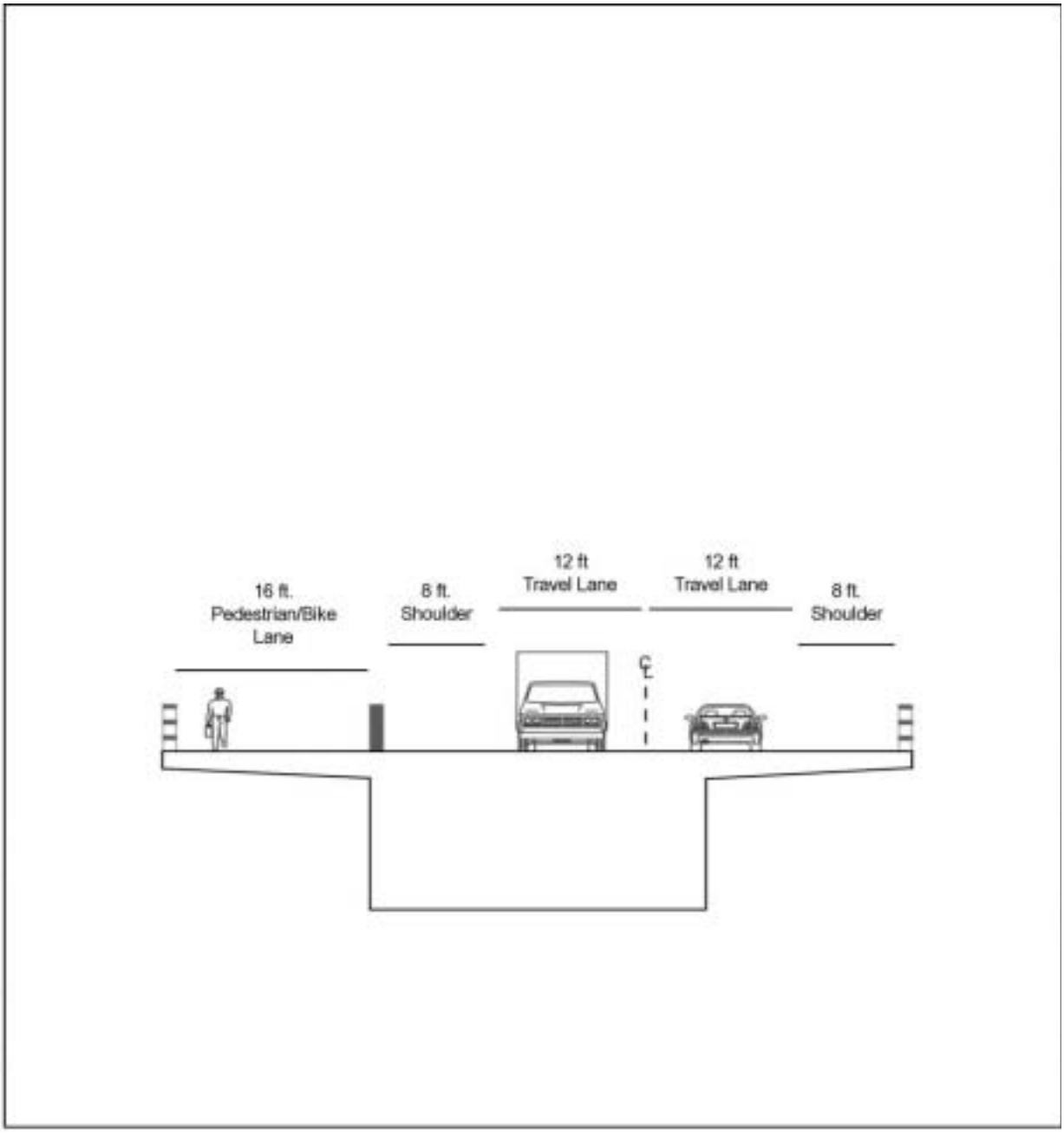
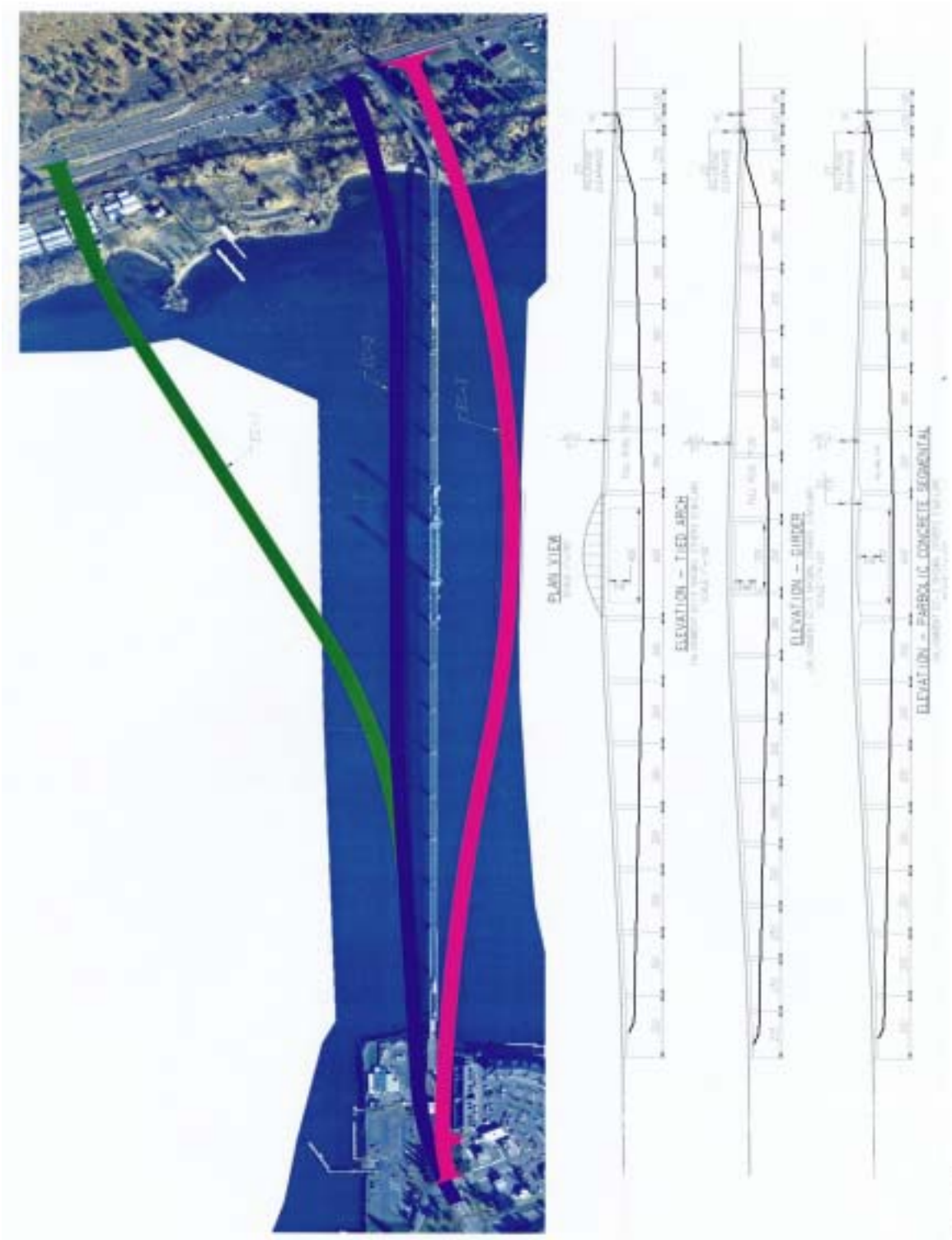


Figure 5: Bridge Design Types



TIER III

The "DEIS crossing alternatives" considered during Tier III are shown above in Figure 3. There were three "build" alternatives. In addition, a no-action alternative was carried forward from Tier II and was one of the DEIS alternatives considered.

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. To accommodate the additional traffic, Dock Grade would need to be widened to provide standard lane widths and shoulders up the bluff into White Salmon.

- *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 east 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.

Alternative EC-2 was selected as the preliminary preferred alternative in the DEIS.

Public Involvement

Tier III included continuation of public and agency involvement activities. Tier III public and agency involvement activities are summarized in more detail below.

Advisory Committee Meetings

For Tier III, the previous two advisory committees were combined into the SR-35 Advisory Committee (AC). The AC met three times during Tier III. Purposes of the meetings included:

- *First meeting, November 2002*. This meeting was held to kick off Tier III activities including the schedule of events and a reconfirmation of the DEIS alternatives being studied.

- *Second meeting, March 2003*. At this meeting the AC reviewed the preliminary recommendation of the SR-35 Management Team to select EC-2 as the preliminary preferred alternative. Committee members also discussed the upcoming DEIS process and schedule.

- *Third meeting, March 2004.* This was the final AC meeting. The AC reviewed public comments from the DEIS public hearing and comment period, confirmed the selection of

EC-2 as the Preliminary Preferred alternative, and reviewed the project's next steps and funding status.

Resource Regulatory Committee

A field tour of the three DEIS alternative alignments was conducted for RRC members in February 2003. As part of this field visit, an RRC meeting was convened.

Public Meetings

Two public open houses were conducted in this Tier:

- *First open house, May 2003:* Participants reviewed and commented on the preliminary selection of Alternative EC-2 as the Preliminary Preferred alternative.

- *Second open house and DEIS Public Hearing, January 2004:* An open house convened to discuss the rationale for selecting EC-2 as the Preliminary Preferred alternative, to receive comments for the Draft EIS, and to provide a final public forum prior to publication of the Draft EIS.

Newsletter Updates

Two newsletters and a press release were prepared and distributed in during Tier III. The first newsletter was issued in May 2003 advertising the open house and the preliminary selection of Alternative EC-2 as the Preliminary Preferred alternative. The second newsletter was issued after the publication of the DEIS and summarized the project, the Preliminary Preferred alternative, and next steps for the project. A press release was issued in January 2004 advertising the DEIS public hearing and open house.

Environmental Review and DEIS

To support the alternatives evaluation in Tier III (DEIS), additional environmental data collection was performed and technical reports written for the DEIS alternatives. In addition, tribal coordination was continued, comprehensive evaluation and selection criteria were developed, and agency coordination with resource and regulatory agencies was conducted. From these activities, potential impacts and mitigation issues to the environment were identified for each alternative. This evaluation was documented in the DEIS.

As a bi-state transportation project, the SR-35 Study invokes both the Washington NEPA/SEPA/404 Merger (Signatory Agency Committee or SAC) and the Oregon Collaborative Environmental and Transportation Agreement to Streamline (CETAS) environmental streamlining processes. Concurrence on the DEIS alternatives was obtained during Tier III.

Alternatives Analysis and Recommendations

An alternatives evaluation was conducted during Tier III which consisted of using the information regarding potential impacts described in the environmental technical reports, along with public and agency input, to evaluate the DEIS alternatives and select a preliminary preferred alternative. The SR-35 Management Team selected a preliminary preferred alternative in the summer of 2003, and a public hearing and open house was held in January 2004 to receive public comment on the DEIS. Public support for the project was received and there was no significant public opposition.

The preliminary preferred alternative (Alternative EC-2) as described in the DEIS, is the course of action that the lead agencies have preliminarily determined to be most desirable in terms of

balancing functional efficiency and environmental, social, and economic effects. This selection of a preferred alternative is preliminary and subject to revision. The final evaluation and selection of a preferred alternative will be based on the FEIS and any other pertinent information that may become available. Comments and information that would assist in such an evaluation are encouraged.

Environmental Consequences
The SR-35 project has environmental impacts, but has a number of benefits over the existing bridge. These were detailed in the Draft Environmental Impact Statement. The following is a summary of the environmental consequences of the Preliminary Preferred alternative.

Environmental *impacts* are summarized below. Mitigation for all impacts is summarized in the DEIS.

- Occasional road closures and business disruptions due to construction of the new bridge and approach roads,
- Impacts to river navigation while the bridge structure over the navigation channel is being built,
- A small risk of erosion during construction (that would be mitigated by implementing an erosion control plan during construction),
- Increased snow removal efforts and potential use of de-icing materials on the bridge which would need to be treated in the stormwater facilities,
- Some right-of-way acquisition and closure of several driveways,
- Removal of the current bridge (which has been determined as eligible to be listed on the National Register of Historic Places),
- Potential impacts to archaeological sites during construction,
- Some vegetation, wetlands and wildlife impacts during construction and operations,
- Potential impacts on in-river habitat due to bridge piers and illumination, and
- Visual impacts of having a new bridge.

Environmental *benefits* are based on comparison to the No-Build alternative and include:

- Alleviation of significant traffic congestion and ramp queuing on the bridge and approach roads, and with that improved fuel efficiency and reduced air pollution,
- Providing a wider navigation channel that meets current standards,
- Bicycle and pedestrian facilities would be provided across the Columbia River where none currently exist,
- The weight/load restriction on trucks would be removed, enhancing cross-river transportation of goods,

- Improvement to water quality and removal of direct, untreated stormwater runoff into the Columbia River which is experienced with the current bridge,

- Economic benefits by accommodating cross-river bicycle and pedestrian travel, improved goods flow, and road capacity to accommodate long-term growth,

- Fewer bridge piers in the water may reduce habitat for predatory fish compared to the current bridge.

FUNDING AND IMPLEMENTATION PLAN

A funding and implementation plan was prepared which outlined how the bridge project could be funded and completed over time. Using potential toll revenue described in the Tier II Financial Feasibility Study, along with a summary of existing and potential future revenue and funding sources, a preliminary recommended funding strategy was developed. The strategy is based on a projected $200 million total cost (in 2004 dollars). This recommended Plan provides for full funding for construction over three successive federal transportation funding reauthorization periods and future Oregon and Washington state funding updates. The funding plan should be updated after each step is achieved to identify changes in funding resources and outlook, timelines, and jurisdiction or project responsibility.

Financial Feasibility Study

As part of Tier II of the study, public opinion surveys were conducted in October 2001. Key objectives of both surveys were to gather information about bridge user travel patterns, gauge interest in a new crossing, and determine their willingness to pay higher tolls — the latter being a key source of financing for a new facility. A planning-grade Financial Feasibility Analysis was completed during Tier II (2002) analyzing the results of bridge intercept survey and resident phone survey as to potential local funding strategies and willingness to pay tolls to support a bridge replacement project.

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 percent of respondents in the telephone survey supported tolls as a partial 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. The results of the survey analysis indicate that bridge traffic demand is generally inelastic, meaning that there will be about the same amount of usage regardless of toll costs. Because there is no good substitute for crossing the river, there is a lower elasticity of demand than if there were several bridges in the immediate area. Higher tolls and similar traffic volumes generate more revenue.

Analysis of the results of the two surveys suggests that the overall revenue maximizing toll rate is about $2.00. To be conservative and to allow room for upward adjustment if necessary, the optimal toll target was set at $1.50 in 2001 dollars, or about $1.75 inflated to 2010 dollars to coincide with project completion. To minimize potential adverse demand impacts of single large toll increase, the toll could be increased in smaller amounts (25 cent increments) over a period of time. The assumption of the financial analysis is that the nominal toll would be bumped to $1.00 in 2004 and on up to the $1.75 by 2010 to coincide with the opening of the new crossing.

An analysis of the funding capacity of the toll revenue stream indicated that there is not a toll level which would pay for 100 percent of the bridge replacement project costs.

Proposed Toll Policy and Financing Options

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, of which some of this is being used for standard operating and maintenance expenses as well as the "redecking" project currently underway. The remaining 50¢ flows to the Port's general fund and typically more than covers routine operations and maintenance costs of the bridge while also providing for economic development programs of the Port.

A major re-decking of the existing bridge is occurring in 2004. The Port issued bonds to finance the portion of this $7-8 million project cost not currently set aside within the R&R fund.

With a toll increase to $1.00 in 2004, this would free up 50¢, or about $1.5 million in annual toll revenue to be used to help fund the capital costs for a new crossing. From 2004 through 2009, these local funds would add up to about $9.0 million to fund part of the bridge capital investment. Upon opening of the new bridge, the proposed toll could 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. Note that at no time is the proposed toll rate higher in real terms than the 50¢ toll charged in 1975.

An analysis of revenue-flow indicates that when the new crossing opens (assumed for this analysis in 2010) the annual toll revenue potential is approximately $4 million. Considering the forecast traffic volume range, 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 backed by the taxing authority of the Port or the State. Based upon a set of assumptions in this model, 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. More information on this model can be found in the Financial Feasibility Study report conducted during Tier II.

Assuming $0.5 million for annual operations and maintenance of a new crossing, that leaves approximately $3.5 million as the middle-range of net toll revenues available for debt service. This in turn could 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. Since this revenue maximizing toll estimate is most likely conservative, it may be reasonable to consider a $2.00 opening day toll, which would generate approximately 7-10 percent more revenue net of its demand impacts (see the Financial Analysis report, 2002). There may be other ways to structure the financing to leverage additional project funds, and a more in-depth financial analysis should be undertaken as the project moves forward.

Other Local Revenue Potential

The feasibility analysis suggested that tolls would be sufficient to cover upwards of 40 percent of the total capital costs of the improvement project. It is assumed that the bridge will need to be funded 50 percent by state and federal sources, and 50 percent by local sources (either toll

revenues or another local revenue source). 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.

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.

Survey data shows that most bridge users are from Washington State; the motorist intercept study conducted in October 2001 indicated that nearly 72 percent of respondents and nearly 80 percent of monthly bridge users are Washingtonians, with all but about 1 percent of the remainder from 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 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.

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 percent 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 percent sales tax increase would rise between $592,000 and $872,000.

The problem with all of these tax options is that most of the benefit of the new bridge crossing is not received countywide. Most of these taxes are either 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 the taxing area is limited to the cities of White Salmon and Bingen only, it is exceedingly unlikely that these communities could raise $1 million annually due to their small economic bases. Local options taxes in White Salmon and Bingen could include a combination of a 0.5 percent real estate excise tax increase; a 0.5 percent 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 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 occur through use of 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 could generate close to $1 million annually while keeping tax rates below maximum levels and charging city residents $1 per $1000 assessed valuation compared to $0.75 for most other county residents.

Public/Private Partnerships

A Public-Private Partnership is a contractual agreement between a public agency (federal, state or local) and a for-profit corporation. Through this agreement, the skills and assets of each sector (public and private) are shared in delivering a service or facility for the use of the general public. In addition to the sharing of resources, each party shares in the potential risks and rewards in the delivery of the service and/or facility.

There are more than a dozen types of public/private partnerships. Some of the most common are Build-Own-Operate, Buy-Build-Operate, Design-Build, Design-Build-Operate, and Sale-Leaseback.

In Oregon, ODOT currently only solicits project proposals through issuance of a Request for Proposals (RFP). The RFP may invite private entities to propose to construct, acquire, improve, finance and/or operate ODOT specified transportation facilities in specific locations. As this new program matures, Oregon law will allow public entities to receive, evaluate and select for negotiations unsolicited proposals from private entities to acquire, construct, improve, maintain and/or operate qualifying transportation facilities.

In Washington, the 1993 Public Private Initiatives Act (PPIA) gave WSDOT authority to enter into agreements with private companies for development, financing, and construction and operations of transportation facilities. The legislature capitalized a revolving fund with $25 million bond authorization. Subsequent legislative changes to the program resulted in projects either being cancelled or turned back to fully State development. As it currently stands, the existing law does not provide much incentive for private sector involvement and prohibits any projects without legislative approval.

Possibilities for partnerships may include a private company completing the final design of a new bridge, building it, operating it, and maintaining it with continued tolls (Design/Build/Operate/Maintain).

Federal Funding Options

Construction of a new SR-35 Columbia River Crossing would be eligible for the following Federal funding programs:

- *Bridge Rehabilitation and Replacement ("BR"):* Both Oregon and Washington receive annual apportionments which are distributed to projects based on a priority rating scale of bridge structural and functional condition.

- *National Highway System:* If the states of Oregon and Washington determine that a new Columbia River Crossing is of high enough importance to designate it a route on the National Highway System (NHS), this would make the bridge replacement project eligible for NHS funds.

- *Surface Transportation Program (STP):* Typically funds urban area small and medium-sized transportation projects. This is not a likely funding source to replace the bridge but would likely fund endpoint projects (such as the I-84 interchange and ramps).

- *Enhancement:* Funds historical transportation facilities, bicycle and pedestrian projects, and wetland enhancements. This source could be used to fund part of the multi-use pathway construction on the bridge and connection.

- *Special Programs – Corridors and Borders, High Priority Projects:* These special programs funded the SR-35 Columbia River Crossing Study work. The reauthorization bill being considered by the United States House of Representatives could establish a large project or "mega-project" fund for projects of hundreds of millions in scale that the SR-35 bridge project may be a candidate for. This is the most likely federal funding source for the project and would take a significant support effort with the congressional representatives and senators from both Oregon and Washington to include the SR-35 project as a line item.

- *Transportation Infrastructure Finance and Innovation Act (TIFIA):* It may be possible to receive credit assistance and/or receive a subordinate debt loan from the Federal Department of Transportation under the TIFIA. By either improving the credit rating of the project or repaying a federal loan from remaining revenues after the senior debt service is paid, it may be possible to increase the project funds generated.

The Transportation Equity Act for the 21st Century (TEA-21) expired at the end of federal Fiscal Year 2003 and has not yet been reauthorized. A funding request for $800,000 to complete the FEIS as well as preliminary engineering is being proposed by the Washington congressional delegation as part of the reauthorization project requests. This has been included in the version of the bill passed by the House of Representatives in April 2004.

Any federal funding programmed for this project will require non-federal matching funds.

State Funding Processes

Both WSDOT and ODOT are required to submit a Statewide Transportation Improvement Program (STIP) at least once every 2 years to FHWA which lists all of the projects programmed for federal funding.

WSDOT has programmed a traffic signal installation at the SR-14 intersection with the Hood River Bridge access road for 2004. That would complete one of the medium- and long-term improvement projects included in the Preliminary Preferred alternative.

ODOT has considered advancing the short-term project of roundabouts at the I-84 ramps through its STIP process. At this time, no project has been programmed; however, ODOT has recognized this as a short-term improvement need. The short-term project to provide roundabouts at the I-84 ramps is a component of the long-range preferred alternative. ODOT also has funds programmed through the OTIA Bridge Replacement program to replace the I-84 overpass over the Hood River Bridge access road and connection to Oregon 35.

Both Oregon and Washington have recently enacted legislation that provided significant increases in state funding for state highway projects.

In Oregon, the Oregon Transportation Investment Act (OTIA) and Bridge Rehabilitation Program increased user fees and license plate fees to pay for corridor modernization (OTIA) and cracked bridge replacement (Bridge Program). Although neither program included the SR-35 project, it would be eligible under both programs should updates or replacements of these programs be adopted in the future.

In Washington, the legislature passed the "Nickel" package which raised the state gas tax by five cents per gallon to pay for a multibillion dollar list of projects. The SR-35 project was not included on this list, but would be a likely candidate for future gas tax increases or supplements to this program.

In Washington, some state gas tax funds are programmed for the Transportation Improvement Board, which administers two relevant project programs: the Transportation Partnership Program (TPP). The TPP funds multi-jurisdictional and multimodal projects, and the Arterial Improvement Program (AIP), which funds arterial improvement projects. Projects tend to be medium in size and the TIB typically funds less than $10 million per project. WSDOT is not eligible to apply for funding, so Bingen or White Salmon would need to apply and receive special dispensation from TIB since they are considered small cities in the current TIB program, and thus would be ineligible to apply for the current TPP or AIP programs.

In Oregon, gas tax receipts are apportioned directly to cities and counties. The City of Hood River and Hood River County may be able to program some funds to help with the local match, but it is unlikely that this could exceed $1 million in total.

No other state funding source would be considered significant enough to be able to provide funds for this project.

Recommended Strategy and Implementation Plan

The following is a preliminary recommended funding strategy, based on available funding sources and the planning-grade traffic projections and financial analysis. The strategy is based on a projected $200 million total cost (in 2004 dollars). This recommended Plan provides for full funding for construction over three successive federal transportation acts and successive state project funding acts.

The Implementation Plan should be updated after each step is achieved to identify changes in funding resources and outlook, timelines, and jurisdiction or project responsibility.

Short Term

1. Increase the toll by 25 cents immediately and establish a dedicated and restricted Bridge Replacement Fund. This fund balance could reach $9 million by 2010 if initiated in 2004.

2. Complete the Final Environmental Impact Statement and Preliminary Engineering (PE), assuming efforts to secure the necessary $800,000 of federal funding with $200,000 local match are successful. Local match could come from apportionments by ODOT, WSDOT, Port of Hood River, Klickitat County, Bingen, White Salmon, and/or the City of Hood River. Use the cost estimate from the PE to put a funding package together for congressional action. Timeline is 2005 to 2006.

3. Install the traffic signal at SR-14 and the Bridge Access Road in 2004, which is funded by WSDOT and programmed for construction in 2004.

4. Program and install the I-84 ramp/bridge access road intersection improvements (preferably roundabouts but signalization is still an option). ODOT has indicated they will be studying this improvement in the next 2-3 years and may program the improvements in the 2006-2009 STIP. These improvements would accommodate the future, long-term bridge replacement project. This would be approximately $2 million of the cost of the long-term project.

5. Convert toll booths to one-way toll southbound and automate toll collections (timeline is 2006 to 2008).

Medium Term

In the 2009 to 2013 federal funding authorization, seek funds for the final design, permitting, and right-of-way acquisition for the bridge replacement through the High Priority or Large Project program. This could be allocated over the five or six years of the next Act. Timelines are expected as follows:

- Final design: 2009 to 2011
- Right-of-way plans and acquisition: 2010 to 2012
- Permitting: 2011 to 2012.

Total estimated cost for final design, permitting, and right-of-way acquisition is in the range of $15 to 22 million.

- Seek federal earmark for $12 to 16 million
- Local match from Bridge Replacement fund (toll receipts) of $3 to 6 million.

It is at this point in the timeline the Congressional delegations of each state should coordinate on seeking federal funding for the construction phase of the project. Additionally, local state legislators should begin their work to seek earmarks in updates of the state highway funding packages in both Oregon and Washington for major portions of the local match for the construction phase.

Long Term

The toll revenue is expected to pay upwards of 40 percent of the construction cost, estimated at $170 to 180 million expressed in 2004 dollars. This is approximately $60 to 80 million of the total cost. Approximately $50 to 60 million in Federal funds should be sought from a variety of sources (High Priority or Major Projects programs, Enhancement, Bridge Rehabilitation) in the 2014 to 2018 federal Transportation Act.

The remaining $40 to $60 million in funding needs could come from a variety of local and state funding resources, the majority of which could come from future updates of the Oregon and Washington state highway funding packages, of which $25 million should be sought from each state for a total of $50 million. The remaining needed funding could come from a variety of local funding sources, such as the Klickitat County Landfill account, local option taxes in White Salmon, Bingen, and Hood River; contributions from the Port of Hood River; and other funding sources.

Demolition of the existing bridge, estimated to cost approximately $5 million, could be deferred to a later phase if funding is insufficient to include that effort.

Oregon and Washington federal Enhancement programs can pay for the multi-use path construction on the bridge and on the bridge approaches and access roads, as well as viewpoints identified in the Columbia Gorge Commission's March 2004 design workshop.

Figure 6 presents a timeline of activities from today through bridge construction and existing bridge demolition and Figure 7 summarizes the approximately funding percentages by source.

Figure 6: Implementation Plan Flow

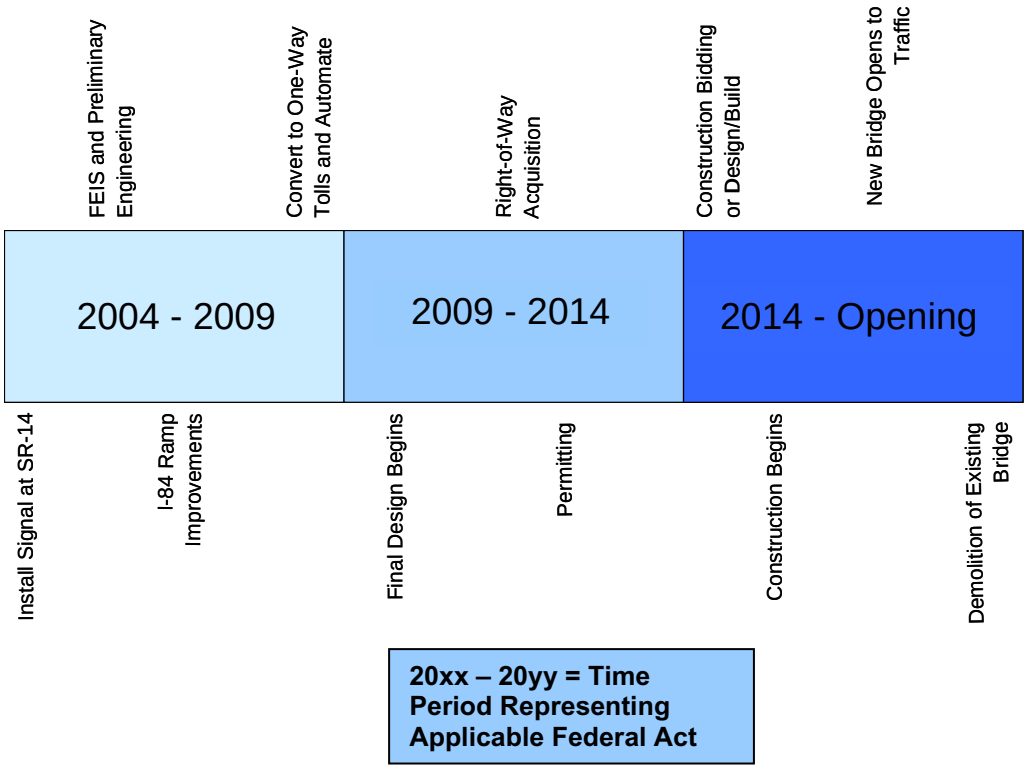
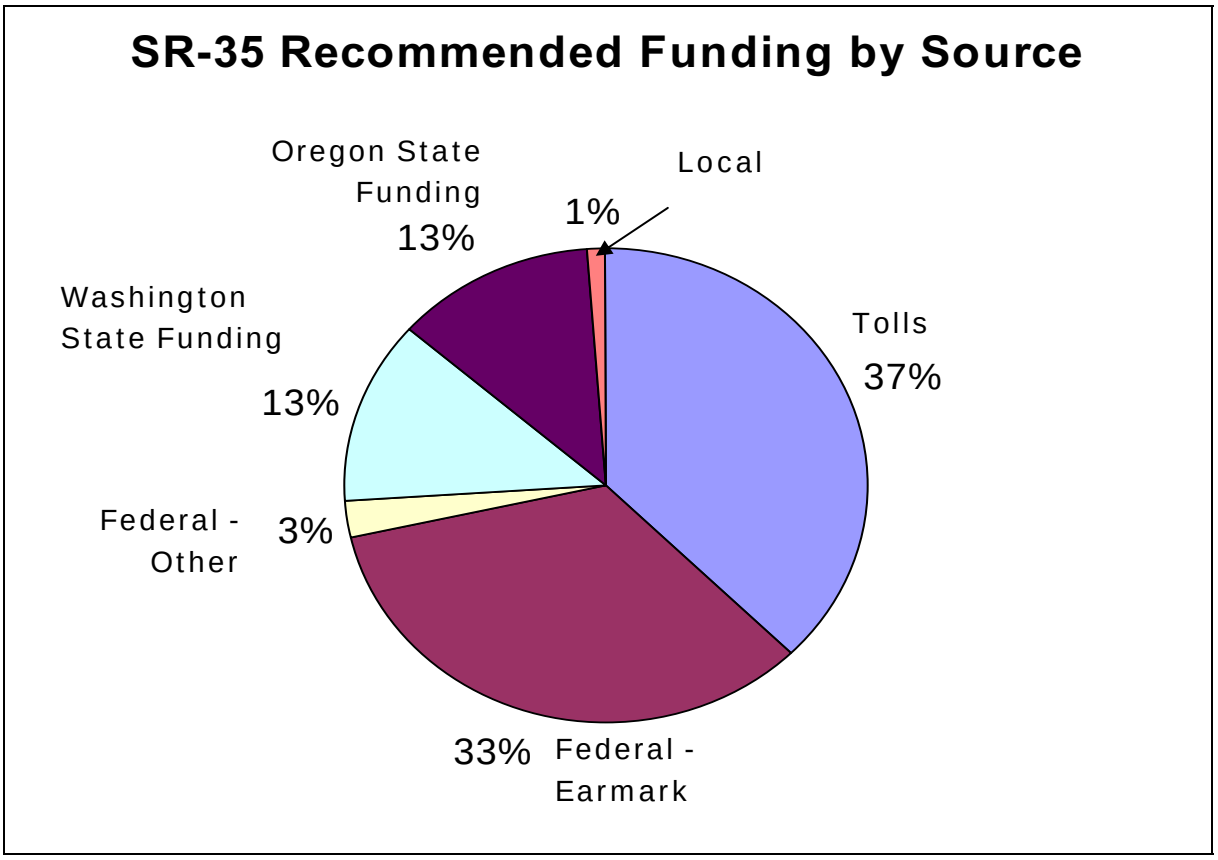


Figure 7: Recommended Funding by Source



HISTORICAL SIGNIFICANCE OF THE HOOD RIVER BRIDGE

The Hood River Bridge is a long steel interstate bridge that was privately built but has been owned by the Port of Hood River since 1950 (The Hood River News 1998). The bridge is not currently listed as a significant historic bridge in either Oregon or Washington. An assessment was conducted to determine the historical significance for the Hood River Bridge. Implementing the preliminary preferred alternative would include demolishing this bridge as part of constructing a new bridge across the Columbia River.

The assessment recommends that the Hood River Bridge is eligible for listing in the National Register of Historic Places, thus it is historically significant. Furthermore, the study finds that the removal of the bridge would have an adverse effect on the historic structure. Although this was concluded after the DEIS was finalized, the DEIS assumed the existing bridge would be historically significant.

Proposed mitigation measures were offered by both the Oregon and Washington State Historic Preservation Offices. Both recommended that some level of photographic and structural documentation be prepared in accordance with the Historic American Engineering Record (HAER) specifications. This documentation would be completed prior to demolition.

ROUNDABOUT ANALYSIS

The purpose of the Roundabout study was to prepare an in-depth review and analysis of roundabouts at the I-84 interchange with the bridge access road. Several future alternative scenarios were considered and a comparison drawn to the “No-Build” scenario for this analysis. The options included “No-Build”, intersections with signals, and roundabouts at the Interstate Highway 84 and Oregon Highway 35 (I-84/OR-35) interchange. Highway capacity analysis was conducted using micro-simulation models and corroborated with Highway Capacity Software-2000 (HCS-2000) analyses.

A micro-simulation roundabout model was developed using VISSIM, a widely used tool for preparing transportation analyses including roundabouts. Two consecutive roundabout operations were studied in detail using both simulation and the FHWA’s analytical methodology.

From the analysis of traffic for the SR-35 Columbia River Crossing study area in 2025, the recommended concept consists of urban roundabouts at the ramp termini and with the Marina Drive/retail access road. Figure 8 details the design assumptions for the two roundabouts. To alleviate queuing at the eastbound ramp terminus, a potential “flare” or widening could be added at the intersection throat to allow for two vehicles to simultaneously enter the roundabout (one to turn southbound toward Button Junction, the other to travel around the roundabout to go northbound).

The roundabouts show acceptable levels-of-service and queuing at both I-84 intersections for the year 2025 peak periods. “No-build” or signalized intersection approaches would have operations at or near capacity and queues that will extend onto the I-84 mainline in the short-term future. It was recommended that the retail entrance be combined with the westbound off-ramp into a composite roundabout. This is the best option due to the close proximity of this intersection to the westbound I-84 ramps, and the geometry of the two intersections will not allow feasible operations if both intersections are signalized.

Figure 8: Roundabout Design

Study Area and Assumptions

The study area for analysis included Oregon Highway 35 from Button Junction (the US-30 intersection with OR 35) north to I-84 (including the I-84 ramps), and then the Hood River Bridge access road extending across the Hood River Bridge to SR-14 in the North. The simulations developed for the alternatives included the I-84 ramps (Eastbound On- and Off- ramp and Westbound On- and Off- ramp), the All Way Stop Control (AWSC) at Marina Drive (Port Entry) and the Bridge access road and retail access, and the toll booth. It is assumed that the private driveway between the toll booth and retail access would be closed in the future for safety and traffic operations needs, and its traffic would shift to the retail access under future alternatives. shows the study area along with the intersections included in the study.

The tollbooth is located at the southern end of the Hood River Bridge and currently tolls are collected for both travel directions (two-way tolls). The Hood River Bridge is owned and operated by the Port of Hood River with a current toll charge of $0.75. For the purpose of this study, it was assumed that in the future tolls will be collected one-way southbound (under either build alternatives or medium-term 10-15 year alternatives). The assumption is primarily aimed at avoiding future queue spillovers at the I-84 eastbound and westbound off-ramps and SR-35 intersections. The Hood River Bridge can accommodate long queues due to its longer span.

Figure 9: OR-35 Roundabout Study Area

The OR-35 corridor is primarily two lanes. There are no separated pedestrian or bicycle facilities in the study area; pedestrians and bicyclists are restricted from the bridge.

Since trucks use the bridge and the surrounding road system, and given the constrained environment under which the improvements are taking place, the roundabout and design concept included a consideration for trucks. For the OR-35 bridge access road and the roundabout itself, and for East Marina Way, allowances were made for WB-67 (large, semi truck). For Marina Drive west of the Bridge access road, allowances were made for a

Greyhound-type bus but the design could not accommodate larger trucks (but can accommodate smaller trucks). Discussions with the Port of Hood River indicate that they do not believe this constraint will be of any significant impact.

Traffic Analysis

Traffic patterns in the area around Hood River Bridge are influenced by three factors: the limited number of roads connecting with the bridge; the location of a majority of the jobs in the region on the south side of the Columbia River; and the differences in the tax structure between Oregon and Washington. The Washington sales tax provides an added incentive for Washington residents to do their major shopping in Oregon where there is no sales tax. Traffic was studied for the area using micro-simulation models and HCS-2000. Simulation models using Synchro/SimTraffic 6.0 (Trafficware Corporation, 2003) and VISSIM 3.7 (PTV America, Inc.) were used to examine the impacts of queuing on I-84 and intersections along the design alternatives. These included OR-35 and I-84 eastbound, OR-35 and I-84 westbound, and Bridge access at retail/Marina Drive intersections. Degrees of saturation for the "No-Build" and signalized intersections alternatives were reviewed using HCS and for roundabouts using the FHWA methodology. The analysis began by reviewing base year and future (2025) traffic volumes and other related information available for the study area.

Existing and Future - 2025 Volumes

Existing traffic counts from year 2000 were used for the base year for the PM peak hour. Using historical counts, population and employment growth projections and the origin-destination survey conducted by RTC, future travel forecasts for future year 2025 were developed by Parsons Brinckerhoff for the SR-35/Columbia River Crossing Draft EIS. Base year traffic data for Marina Drive/Bridge access road intersection were estimated using the ITE Trip Generation Manual. Future volumes for the market place (East Marina Way) were assumed to be constant with respect to the base year and that for the Marina Drive into the Port facilities were assumed to grow at approximately half the rate of I-84/OR-35 intersections. It was assumed that land-use for the retail area along Marina Way will remain the same since the available land is at full build-out and no additional retailers/other land-uses could be accommodated in these parcels.

The analysis was limited to the peak hour of travel for the weekday PM peak hour. From traffic counts, the peak direction of travel was the northbound direction. Traffic composition for the study area was based on the Hood River Bridge Origin and Destination Survey-1990 for most approaches.

Review of Alternative Scenarios

The base year (2000) congestion levels in the vicinity of the Hood River Bridge are relatively low. The Hood River to Mt. Hood, OR-35 Corridor Plan notes that while the traffic volumes in the corridor have been growing there are few congestion problems. The highest level of congestion along the Hood River corridor occurs at the East Hood River Interchange where the OR-35/Hood River Bridge access roadway intersects the I-84 access ramps. These intersections both have a moderate level of congestion (Level-of-service (LOS) D/E) with left turn movement delays of over 40s/veh. In the base year, the I-84 off-ramps operate as Two Way Stop Controlled (TWSC) intersections and the Marina Drive (Port Entry)/retail access operates as an All Way Stop Control (AWSC) intersection.

The three future alternatives study analyzed were "No-Build 2025", Signalize – Build Alternative 1, and Roundabouts – Build Alternative 2. The assumptions used for developing the alternatives are located in Appendix B. Using Year 2025 forecasts for the PM peak hour, degree of saturation (V/C ratio) and delays were determined by traffic-movement and approach for each

alternative. For the “No-Build” and the Signalize options, this was done by developing the model first in Synchro and then exporting the data to HCS-2000. For roundabouts, the FHWA methodology was used. Intersection performance results by design alternatives are shown in Table 6.

Table 6: 2025 Intersection Performances by Alternatives

No.	Intersections along SR-35	Design Alternatives								
		No-Build			Signalize			Roundabout		
		V/C Ratio	Delay (s) / LOS	95% Queue Range (ft)	V/C Ratio	Delay (s) / LOS	95% Queue Range (ft)	V/C Ratio Range	Delay (s)	95% Queue Range (ft)*
1	I-84 EB On-Ramp	0.32	13.3 / B	50 - 75	0.86	42.6 / D	150 - 975	0.32 - 0.86	21.40	275.00
2	I-84 EB Off-Ramp	1.45	282 / F	25 - 975						
3	I-84 WB On- and Off-Ramp	0.59	41.1 / E	25 - 375	0.66	14.8 / B	100 - 525	0.07 - 0.88	21.46	325.00
4	W. Marina Dr./retail	0.85	280 / F	50 - 200	0.85	280 / F	25 - 150			

*Note: Assumes average vehicle length of 25 feet.

Note that in Table 6, 95 percent queue lengths for the “No-Build” and the Signalize options were obtained from SimTraffic. Due to the variations in results of micro-simulation models, 3 runs were conducted and averaged in order to achieve more accurate estimates on the true performance measures. Past research in this area shows that as a general guideline, at least 2 runs are needed under any capacity condition to achieve more accurate estimates.

Findings, Conclusions and Recommendations
A detailed discussion of results by alternative is presented below:

No – Build

- Each of the intersections operates at near failure or LOS E-F conditions overall. Both I-84 off-ramps experience large queues as the drivers wait to turn onto OR-35.
- The queues at I-84 off-ramps extend onto the freeway and would likely affect freeway operations.
- The minor left-turn (off-ramp) has a LOS F and V/C ratio of 1.6.
- Queuing at the toll booth is significant in both directions of traffic and is a problem for the northbound direction as vehicles start to spillback into the intersection where retail shops and the Marina have access. During peak times, the queues even back up into the freeway ramp intersection.

Signalize – Build Alternative 1

- All intersection approach delays remain under 80.0s/veh, the maximum for LOS E. Signalizing the I-84 intersections decreased control delays and improved LOS versus No-Build option.
- I-84 eastbound off-ramps left-turn movement shows a delay of 55.4s/veh with a LOS E. The V/C ratio is 1.02 and queues extend beyond the ramp onto the freeway.

Although the intersection's performance could still be improved by reallocating green times, delay reduction will be minimal because the critical elements are close to capacity.

- Operations at the I-84 westbound off-ramps show significant improvement with signalizing the intersection. The minor left-turn (ramp) movement shows a delay of 30.6 seconds and a LOS C. The V/C ratio is 0.25 for the left-turn movement.

- Northbound OR-35 through traffic shows the highest V/C ratio of 0.70. However, the delay for this movement of traffic is only 2.0 sec/veh and LOS A.

- The Marina Drive/retail access/Highway 35 intersection was retained as all-way stop control (AWSC). The operations do not change at this intersection with signalizing the I-84 ramp intersections. Queue lengths may vary depending on traffic platooning and arrivals.

- The conversion to one-way tolls southbound eliminates toll-booth queue spillovers into the Marina Drive/retail access intersection.

Single-lane Roundabouts – Build Alternative 2

- The roundabout at the I-84 eastbound ramps has 4-legs for OR-35 and I-84 ramps. The critical approach is the I-84 off-ramp with V/C ratio of 0.86. Other approaches show V/C ratios less than 0.6. The I-84 off-ramp approach will operate slightly over-capacity since the desirable maximum V/C ratio is 0.85. This means that this approach may show increased delay and queuing during peak times. As per FHWA guidelines for roundabouts, the circulating flow at any point in this single-lane roundabout does not exceed 1,800veh/h, the threshold for double-lane entry. Double-lane exits are also not recommended for this intersection because exit flows for any approach do not exceed 1,200veh/h, the maximum for single-lane exits.

- The I-84 eastbound ramp/Oregon 35 roundabout critical lane delay is 21.4 sec/veh with the 95 percent queue expected to be at 275 feet.

- The SR-35/Oregon 35/Bridge access road oval roundabout combines the I-84 westbound ramps and the Marina Drive/retail access. The critical approach is northbound SR-35 with a V/C ratio of 0.88. The other approaches operate within the V/C ratios of 0.07 and 0.61. The circulatory flow ranges between 152veh/h to 1066veh/h and is below 1,800veh/h threshold for double-lane entry. The exit flows range between 65veh/h to 1036veh/h and are also below the threshold of 1,200veh/h requiring double-lane exits.

- The oval roundabout shows critical lane delay of 21.46sec/veh and the 95 percent queue extending over 325 feet.

For the two critical approaches (i.e. I-84 eastbound off-ramp of the first roundabout and northbound SR-35 of the oval roundabout), it was recommended that the approaches be flared to accommodate two vehicle short lanes. Short lanes are the additional partial lanes added when flaring a roundabout from one to two lanes. This can help in maintaining operations below the critical level. Results after such a modification show a V/C ratio of less than 0.6 at both the legs.

From the analysis of traffic for the Highway 35/Hood River Bridge study area in 2025, urban flared roundabouts would be the best alternative. Roundabouts show acceptable LOS and queuing at both I-84 intersections based on year 2025 peak hour analysis. “No-build” or signalized intersection approaches will have operations at or near capacity and queues that will in turn affect free-flowing traffic on I-84. It was recommended that the retail entrance be combined with the westbound off-ramp into a composite, oval roundabout. This is the best option since the westbound off-ramp and Marina Drive intersections are in close proximity to each other and the geometry of the two intersections will not allow feasible operations if both intersections are signalized. Nor will it be operationally acceptable to let the Marina Drive/Highway 35 intersection operate as AWSC in 2025, as seen in Build Alternative-2.

Generally, roundabouts are cheaper to build and maintain than signalized intersections. Roundabouts may require more right-of-way than traditional intersections controlled by traffic signals or stop signs. Most of the regular maintenance costs of roundabouts are related to landscaping, lighting, and standard roadway maintenance (e.g. snowplowing, street cleaning). As part of the current study, the cost of constructing roundabouts at the two I-84 intersections was estimated to be in the range of $1.0 – 1.5 Million depending on more detailed design analysis including whether or not retaining walls are needed. The total cost does not include allowance for environmental mitigation. The roundabouts’ designs were based on FHWA requirements. To alleviate queuing at the eastbound ramp terminus, a potential “flare” or widening could be added at the intersection throat to allow for two vehicles to simultaneously enter the roundabout (one to turn southbound toward Button Junction, the other to travel around the roundabout to go northbound).

The FHWA report “Roundabout: An Informational Guide” suggests that the roundabout design problem is essentially one of determining a design that will accommodate the traffic demand while minimizing some combination of delay, crashes and costs to all users. In the selection of an appropriate traffic control type for any intersection, it should be assumed that the minimization of a combination of delay, crashes and costs should be the primary measure of effectiveness. Although, this study did not analyze any crash data to reflect crash reduction benefits from constructing roundabouts, many studies conducted in the past have shown that for single-lane urban stop-controlled intersection overall crash reduction of more than 60 percent can be achieved after constructing roundabouts at such locations. For signalized intersections, such conversions have shown an overall crash reduction of more than 30 percent.

Figure 10 shows a screenshot of the traffic simulation of the roundabouts.

Note: at the time of this report, ODOT is still discussing the roundabout and is still considering other non-tradition intersection and interchange designs at this location. They will be undertaking additional study and project development activities prior to implementing this short-term project through the Oregon Statewide Transportation Improvement Program.

Figure 10: VISSIM Micro-simulation for Roundabout

SCOPE OF WORK FOR FINAL EIS AND PRELIMINARY ENGINEERING

Project Management and Coordination

- Project Management and Quality Assurance
- Project Invoices and Progress Reports
- Kickoff and Design Coordination Meetings

Environmental Task

1. Update technical sections with new information and regulatory changes and prepare detailed mitigation plan that addresses project impacts to shoreline habitat, in-stream habitats, and water quality.
    a. Soils and Geology
    b. Fish
    c. Wildlife
    d. Vegetation
        i. Conduct additional plant surveys for sensitive species during appropriate seasons particularly on the Washington shore area disturbed during construction.
        ii. Address project impacts on invasive species, including prevention and control of outbreaks.
    e. Wetlands
    f. Waterways/Water Quality
        i. Coordinate with design team to address specifications of bridge drainage capacity, treatment facilities, spill prevention and containment plans.
        ii. Disclose detailed construction impacts on water quality
        iii. Address snow and ice management in water quality section
        iv. Identify any monitoring wells, wells that would be abandoned, water rights, or water licenses that would be affected. Comply with Oregon Water Resources Department guidance.
    g. Land Use
        i. Coordinate with Columbia Gorge Commission on any new policies that address project compliance with the Columbia River Gorge National Scenic Area management plan
        ii. Reevaluate project consistency with the Port of Hood River marina master plan and the river walk conceptual plan.
    h. Social and Economic Elements
        i. Perform further outreach to nearby census blocks and block groups that contain higher proportions of minority and low-income populations compared to local, county and state distributions.
        ii. Include more discussion on the financial feasibility study: data and analysis to disclose the need for tolls
        iii. Consider interpretive signs on proposed bridge
    i. Relocations
    j. Visual Resources
    k. Noise
    l. Air Quality
        i. Address toxics and particulate matter on sensitive receptors, including treaty access fishing sites

m. Energy
n. Hazardous Materials

2. Comply with Section 106 of the National Historic Preservation Act
    a. Determine the Area of Potential Effects (APE)
    b. Conduct archaeological surveys in areas that will have ground disturbance within the preferred alternative footprint; these areas may involve underwater exploration
    c. Determine eligibility of any archaeological resources identified within the APE
    d. Make a finding of effect for any archaeological resources that are eligible for listing on the National Register of Historic Places
    e. If any resources are found to be adversely affected, develop mitigation measures and prepare a Memorandum of Agreement.
    f. Coordinate with Oregon and Washington State Historic Preservation Officers, Port of Hood River, and other local historic preservation groups
    g. Provide evidence and detailed explanation on why all alternatives that preserved the Hood River Bridge were eliminated from further study in the EIS (e.g., bridge structural evaluations, barge accidents)
3. Coordinate and consult with Native American tribes
   Note: Outreach should include efforts to meet in-person with representatives of each tribe and utilize any formalized or regular meetings to discuss transportation projects. Continue to coordinate with WSDOT and ODOT tribal liaisons.
   Tribes will also continue to be consulted during the on-going section 106 process. As the area of potential effects (APE) is established, the tribes will have an opportunity to comment. Depending on the results of the archaeological surveys conducted for the FEIS, the tribes will likely be involved in the findings of those surveys, effects to the resources, and any needed mitigative strategies.
    a. Tribes include: Yakama Nation, Confederated Tribes of the Warm Springs, Confederated Tribes of the Umatilla Reservation, and Nez Perce
    b. Engage tribes in face-to-face meetings
    c. Comply with the WSDOT Centennial Accord
    d. Coordinate with tribes on potential project impacts to treaty access fishing sites and Section 106 resources
    e. Disclose construction impacts and operational impacts on treaty access fishing sites
    f. Review compliance with treaty rights in the land use plan consistency section
4. Prepare a Biological Assessment
    a. Coordinate and consult with NOAA Fisheries and US Fish and Wildlife Service to obtain updated species lists and other relevant information
    b. Address the NOAA Fisheries Stormwater Guidance
    c. Determine effect of project on applicable ESA species
    d. Develop acceptable mitigation measures
5. Comply with Section 4(f) of the US Department of Transportation Act
    a. Determine if the Hood River Bridge is applicable to Section 4(f)
    b. Determine if any other resources in the project area are applicable to Section 4(f)
    c. If applicable, update the draft Section 4(f) Evaluation
    d. Coordinate with both State Historic Preservation Officers, Port of Hood River, and other local historic preservation groups
6. Expand Secondary and Cumulative Impacts Discussion
    a. Air quality
    b. Noise

c. Hazardous material transport
d. Induced growth

7. Environmental Streamlining
    a. Concurrence on Detailed Mitigation Plan
    b. Concurrence on Preferred alternative

Preliminary Engineering Task

Preliminary Engineering consists of the following:

- Complete design to approximately 30 percent design level
- Final type, size, and location study
- Determine an architectural design to meet visual and Gorge Management Plan requirements
- Conduct ground survey work to tie-down horizontal and vertical features, horizontal clearances, and right-of-way and property lines
- Conduct detailed Geotechnical, Hydraulic and wind load analyses
- Develop Right-of-Way Plans
- Develop cost estimate to support financing and grant applications
- Achieve design acceptance by ODOT, WSDOT, and other key agencies
- Compete design to a level to support permitting
- Develop Statement of Work for Final Design

1. Project description
    a. Develop a detailed description of the existing bridge
    b. Confirm assumption that existing bridge would be closed in 30 years and describe if and how it would be disposed.
    c. Validate the statements regarding whether the bridge is currently weight restricted.
2. Drainage
    a. Calculate bridge deck drainage capacity and the amount of potential runoff
    b. Determine the location and specifications for a storm water treatment facility
    c. Specify how proposed treated discharges into the Columbia River would comply with water quality standards and how accidental spills would be managed.
3. Survey
    a. Develop survey limits. Approximate survey limits are:

    Washington Side:

    - At SR-14 and approximately 500 feet in each direction from planned intersection with SR-14.
    - Within 200 feet of proposed alignment as shown on DEIS plans.
    - Tie-in existing right-of-way lines
    - Note vertical clearances of the structure to railroad.
    - Tie-in wetlands or other environmental resources as delineated by environmental field crews.

    Oregon side:

    - At I-84 and including ramps
    - Approximately 100 feet on each side of proposed alignment included in the DEIS plans
    - Tie-in existing right-of-way lines
    - Note vertical clearances underneath I-84.

b. Survey distance between proposed alignment and existing businesses and residences in the immediate vicinity; include any delineated environmental resources that were field identified.
c. Determine specific right-of-way acquisition of private property

4. Pier design
   a. Include number and spacing of piers; state whether new bridge would have more or less than the existing
   b. Consider fish-friendly pier designs to reduce predator habitat
5. Coordinate with ODOT should occur regarding the connection of bridge approach road and nearby I-84 ramps.
6. Perform Geotechnical and Hydraulic Studies
   a. Develop geotechnical work plan based on existing data and published geologic data
   b. Conduct hydraulic site reconnaissance and data collection
   c. Conduct flood frequency analysis to develop the 2-year, 10-year, 50-year, 100-year and 500-year flows in the vicinity of the replacement bridge. Contractor shall estimate the magnitude of the Ordinary High Water (OHW) flow from the regulated flood frequency curves.
   d. Bridge hydraulics analysis to analyze water surface profiles, velocities, channel characteristics, and any backwater rise
   e. Calculate contraction scour and pier scour
7. Conduct Wind Load Analysis to support the finalization of bridge type, size, and location.
   a. The wind load analysis will also determine impacts of the bridge on windsurfing and kiteboarding.
   b. A wind model will be developed based on wind rose readings collected as part of this task.
8. Utility coordination
9. Preliminary and architectural design criteria for Permanent Bridge Replacements
   a. Consistent with Gorge Management Plan
   b. Based on SR-35/Columbia River Crossing design workshops
10. Complete Type, Size, and Location Study
    a. Determine final location for the bridge alignment and tie-down endpoint at SR-14 as well as location where the new crossing will tie into the existing bridge access road near I-84.
    b. Determine the bridge and structural member size based on wind load, architectural, and load studies.
    c. Determine for visual aspects the bridge type and architectural design.
11. Cost Estimate to a level of contingency to support financing and grant applications
12. Right of way acquisition plans for bridge, access road, environmental impact mitigation
13. Design acceptance review by ODOT, WSDOT, and Columbia Gorge Commission.
14. Final Design Statement of Work
    a. Plans, Specifications, and Estimate
    b. ODOT, WSDOT, RTC, and Columbia Gorge Commission review

Transportation Task

1. Update traffic modeling results if design year (2025) changes. The design year will be twenty years beyond the completion of the FEIS, if it is issued significantly later than 2005 or 2006.

2. Consider different intersection design, such as a roundabout, at the terminus of the bridge at SR-14.
3. Traffic forecasts relevant to revenue forecasts to support financing.

Public Involvement Task

1. Public activities
   a. Determine whether to use an advisory committee (recommended); assuming a committee is used, undertake the following activities:
      - Conduct up to three meetings with the committee to review, comment and advise on bridge design issues, results of additional environmental analysis, and other public outreach activities.
      - Publicize meetings via media releases
      - Summarize meeting results
   b. Prepare two or three newsletters or fact sheets about the project; distribute to interested parties and via community gathering places, including public offices and local businesses; newsletters would describe the status and results of the FEIS, as well as opportunities for public review and comment on results.
   c. Conduct two or more public workshops or hearings to review the results of the FEIS and preliminary design recommendations; at least one meeting could focus on design issues, similar to the workshop conducted in Tier II of the Feasibility Study and should incorporate results of similar efforts conducted by the Columbia River Gorge Commission. At least one meeting also should allow for an open house format. Specific activities would include:
      - Publicize meetings via media releases, public notices, meeting flyers, newsletter/fact sheets, direct e-mail notices and advisory committee member assistance (assuming an advisory committee is used).
      - Prepare for and conduct meetings, including assisting with meeting materials, logistics and facilitation.
      - Summarize meeting results.
   d. Prepare additional media releases, as needed to publicize project results or activities.
   e. Assist with presentations to local groups, if requested.
   f. Summarize public involvement activities and results in a concise report for incorporation in the FEIS.
2. Coordinate funding strategies with the Port of Hood River
   a. Meet with Port officials at the outset of the project to identify shared objectives, process and schedule for coordination, and responsibilities of project team and Port representatives
   b. Meet periodically with Port to implement process agreed upon in (a)
   c. Summarize meetings and agreements with Port, including possible dedication of toll revenues to a bridge replacement fund

      Note: It might be worthwhile to conduct a similar process with local government (city and county) representatives on both sides of the river.
3. Agency activities
   a. Assist in informing and soliciting comments from state, federal and local agency representatives, as needed, pursuant to NEPA and state environmental review requirements.
   b. Meet or communicate with agency representatives regarding specific issues of concern; identify and clarify such issues for presentation in the FEIS.

c. Work with the Oregon and Washington agency coordinating group processes (CETAS and SAC processes), assisting as needed
d. Coordinate with tribal organizations as described in Section 3 of the Environmental Task.

NEXT STEPS

Final EIS and Preliminary Engineering
This work could begin in early 2005 if the earmark is contained in the final federal transportation reauthorization act.

Beyond Final EIS and PE
After a record of decision is issued, funding can be sought for final design, permitting, right-of-way acquisition, and eventually, construction and environmental impact mitigation.