SR-35 Columbia River Crossing Feasibility Study

Appendices

Tier II Report

Prepared For

Southwest Washington Regional Transportation Council

Washington State Department of Transportation

Oregon Department of Transportation

Prepared By

PARSONS BRINCKERHOFF

In Association with

Entranco, Inc
Cogan Owens Cogan
Zimmer Gunsul Frasca
Archaeological Investigations Northwest
ECO Northwest
Gilmore Research Group

June 2002

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Appendix A – Public Involvement

SR-35 TIER II TECHNICAL MEMORANDUM

PUBLIC INVOLVEMENT

Tier II public and agency involvement included the following activities:

- Three meetings each of the project's Local Advisory Committee (LAC) and Steering Committee (SC). Two of these meetings were conducted as joint meetings with both groups.
- One meeting of the Resource Regulatory Committee (RRC).
- Two public open houses.
- A random sample telephone survey and motorist intercept survey of bridge users.
- Two newsletter updates distributed to the project mailing list and via local businesses, civic buildings, and other meetings.
- A youth bridge design contest.
- Media releases, news articles, and a radio interview with KIHR—AM 1340.
- Speaking presentations to local groups, including Klickitat County Commissioners, White Salmon Rotary, Columbia River Gorge Windsurfing Association, Hood River Rotary, Columbia River Gorge Commission, and the Skamania and Klickitat County Transportation Policy committees.

This appendix includes summaries of comments received at the two open houses, a summary of comments received at the RRC meeting, copies of news releases, and information on the youth design contest.

PUBLIC OPEN HOUSE, October 11, 2001

SUMMARY OF COMMENTS

Prepared October 16, 2001

INTRODUCTION AND OVERVIEW

About 40 people attended this public event to discuss the SR-35 Columbia River Crossing Feasibility Study. The open house was announced in news articles in the *Hood River News* and *White Salmon Enterprise*, as well as in press releases to local newspapers in The Dalles and Skamania County. Attendees participated in the following activities:

- Indicated where they live, work, and how often they use the existing bridge on a large worksheet
- Reviewed location and alignment concepts for crossing alternatives
- Reviewed and commented on an evaluation of crossing alternatives
- Listened to a presentation about the background and status of the study; made comments and asked questions afterwards
- Completed a questionnaire, identifying crossing alternatives that should be evaluated in more detail
- Viewed pictures of different types of bridges and tunnels constructed in other locations

SUMMARY OBSERVATIONS

- Most participants live in Washington (over two-thirds); of those who completed the live/work/bridge use exercise, just over half work in Washington or in both states
- Most attendees use the bridge frequently; of those who completed the live/work/ bridge use exercise, over 80% use it more than once a week
- The following eight options, in order of number of "votes," were the top choices recommended for further study:
  - Fixed span bridge for all modes at the Existing corridor
  - Fixed span bridge for all modes in the East A corridor
  - Fixed span bridge for all modes in the City Center corridor
  - Fixed span bridge for motor vehicles in the City Center corridor, with bikes and pedestrians using the existing bridge
  - Tunnel for motor vehicles in the City Center corridor, with bikes and pedestrians using the existing bridge

- Tunnel for all modes in the existing corridor
- Fixed span bridge for motor vehicles in the existing corridor, with bikes and pedestrians using the existing bridge
- Retrofit of the existing bridge

OPEN HOUSE RESULTS

A summary of the results of each activity follows.

Live/Work/Bridge Use Map

Of those who participated in this exercise, twenty-three live in Washington and five in Oregon. Twelve people work in Washington, ten in Oregon, and three in both Washington and Oregon. Nine people said they use the bridge daily, thirteen 2-3 times per week, three once a week, and two once a month or so. Results are summarized in the following table.

Location	*Live*	*Work*
Washington	23	12
Oregon	5	10
Both Washington and Oregon	0	3
Bridge Use		
Daily		9
2-3 Times Per Week		13
Once a Week		3
Only on Weekends		0
Once a Month or So		2
Not at All		0

Alternatives Evaluation

Participants viewed maps and diagrams of each alternative, as well as the results of a preliminary technical evaluation of them, including a summary of relative impacts related to a variety of criteria. Comments from participants follow.

East A Corridor (near SDS)

- East A Corridor would be coming into Bingen on Cedar Street. I am worried about the stone house (one outstanding house) on the east side of Cedar. There also are many other residents in this area.

- The Bingen marsh/lake would be impacted negatively, including increased noise and pollution, and Peregrine (Falcon) hunting patterns cross the road from power line to pond.

- Do SDS Lumber trucks from Oregon turn left on SR-14 then left again into SDS? (A crossing in this location) could cause a huge congestion problem. Also, trucks will be coming up hill at SR-14 from an underpass.

Existing Corridor (Oregon side)

- Please be explicit in regards to the plans for the I-84 interchange. Many of us feel it must be redesigned if the existing corridor bridge option is adopted.

- Look at reconstructing the interchange if the bridge is kept in the same location.

City Center Corridor (Washington side)

- How can a "T" intersection handle projected traffic?
- Concerned with traffic problems on Washington side, i.e., Highway 14 is narrow and flows very fast.

PRESENTATIONS

During the meeting, Dale Robins, project manager for the Southwest Washington Regional Transportation Council, and Chuck Green, consulting team project manager from Parsons Brinckerhoff, summarized the background and status of the project. They indicated that since our last public open house in March, 2001, the consulting and management teams for the project have conducted the following activities:

- **Further evaluated the crossing corridors** presented at the open house last March and recommended two corridors be eliminated from further study (the West and East B corridors). The Local Advisory and Steering Committees for the project agreed with those recommendations.
- **Developed and started evaluating specific alternative facilities** for further study and recommended some of those be eliminated or retained for more detailed evaluation. These alternatives have been evaluated against a wide range of criteria that correspond to the purpose, need and objectives for this study (e.g., moving people and goods across the bridge, minimizing impacts on the environment and addressing economic conditions and impacts). Of the initial 17 options, have recommended that nine be eliminated from further consideration and the remaining eight be studied in more detail. A "no action" alternative also must be studied per federal regulatory requirements.
- **Reviewed the results of the evaluation with the project's Local Advisory and Steering committees**. They also have recommended which alternatives should be

eliminated or carried further. Most committee recommendations are consistent with those from staff and consultants but some differ.

- **Worked with regulatory agencies to develop a purpose and need statement** for the project, as required by environmental regulations; currently coordinating with those agencies to refine the purpose and need statement and review and refine criteria and alternatives for the study.
- **Began preparing to conduct a random sample survey** of local residents and others who use the existing bridge to help find out how much need people feel there is for a new or improved crossing and how much they might be willing to pay locally to build and operate it. The results of that survey will be used to help evaluate the financial feasibility of a proposed new or improved facility.

The next steps will be to further analyze and narrow the list of potential alternatives. Then, if warranted, an Environmental Impact Statement will be prepared to evaluate the final set of alternatives, and finally, a preferred alternative will be recommended, as well as short and long term financing strategies.

Comments and questions followed the presentations and are paraphrased below. Answers from staff and consultants are show in *italics*.

Question: How often is the bridge raised?

Answer: The bridge is raised about once a month to allow ships to pass or test the lift mechanism.

Question: Will you have models of possible bridges to review at the public open house tentatively scheduled for February, 2002?

Answer: We probably will have sketches or photos that are more representative of actual options. We may construct a model later in the study or bring a model from a similar project elsewhere.

Question: Is the Gorge Commission going to be involved in this project, including reviewing possible bridge designs?

Answer: We presented information about the project to members of the Commission earlier in the week. We expect them to participate in the design workshop with members of the Local Advisory and Steering committees.

Question: Will you have cost estimates in February?

Answer: We hope to have more refined cost estimates by then. At this point, our estimates are very rough because we have not designed the crossing in detail. Consequently, we are just using relative ratings to describe the costs. Costs for alternatives with high cost ratings are typically 2-3 times higher than those alternatives with low cost ratings. Also, we only have developed construction costs at this time. We do not have enough information to determine land acquisition or mitigation costs. Tunnels are the highest cost options.

Question: Will you know who will pay for a new or improved bridge and how much in February?

Answer: *We will not know how much all agencies might contribute but we will know something about the potential amount of local match funds. That information will help us determine how much state and federal matching funds would be needed. We probably will not know all this until late 2002.*

Question: Is the tunnel option at all practical or are we wasting our time in suggesting that it be studied further?

Answer: *The tunnel may be a promising option. It is likely to cost significantly more money to construct but it is a good alternative to study in terms of lower impacts on things such as fish, noise, visual impacts, and windsurfing. We are not wasting time by considering it further.*

Comment: I would typically recommend a more cost-effective option but maybe a tunnel is the best alternative. Some people may think it is ridiculous.

Question: How large would the tunnel be?

Answer: *Probably two lanes. We are developing new 20-year traffic estimates but at this time we only see a need for two lanes.*

Question: Would bikes and pedestrians use the tunnel?

Answer: *We assume they would not. This alternative assumes that the existing bridge would be used for bikes/pedestrians. There are security issues with bikes/pedestrians in the tunnel. We also will look at ownership issues in the next tier of the study. A tunnel could cost anywhere from $250 to 350 million. A new or improved bridge may cost $100 – 200 million in construction costs only.*

Question: A Highway 101 bypass in Gray's Harbor has been discussed for 20 years without anything being built. What is the timeframe here?

Answer: *Nothing will be built particularly soon. It is difficult to say. The environmental process would take two years (2003). Completing that would allow the final design to start. No federal funding for construction of a new facility has been earmarked yet. Federal money likely would need to account for the bulk of the cost for a new or improved facility. The federal transportation authorization cycle is every six years. We also do not know how much money state or local governments would or could contribute. It probably will be six to 20 years before anything is built. If a new river crossing is to become a reality, the local community will need to help pay for the facility and get funding support from federal and state agencies and officials.*

Question: What is the traffic volume/year on the bridge?

Answer: *There are an average of about 7,500 cars per day translating to 2 - 2.3 million vehicles per year.*

Comment: It seems like revenues from tolls or other fees, given that level of use, would make a good local match.

Comment: *We also need to consider maintenance costs. Toll revenues will have to cover those costs for the existing bridge until a new bridge is built.*

OPEN HOUSE QUESTIONNAIRE

As noted above, participants were asked to complete a questionnaire, identifying eight alternatives that should be studied further. Nineteen (19) people completed the questionnaire. Results are summarized in the following table, with the top choices shaded and shown in bold. Specific comments about alternatives follow the table.

City Center Corridor		Existing Corridor		East A Corridor	
Facility	*Votes*	*Facility*	*Votes*	*Facility*	*Votes*
Floating Movable Bridge for all Modes	1	**Fixed Span Bridge for All Modes**	**17**	**Fixed Span Bridge for All Modes**	**11**
		Fixed Span Bridge with bikes and pedestrians using the existing bridge	**5**		
Movable Bridge with bikes and pedestrians using the existing bridge	0	Movable Bridge with bikes and pedestrians using the existing bridge	2		
		Tunnel with bikes and pedestrians using the existing bridge	3		
Movable Bridge for all modes	1	**Tunnel for all modes**	**5**	**Movable bridge for all modes**	1
		Movable Bridge for all modes	1		
Fixed Span Bridge, with bikes and pedestrians using the existing bridge	**6**	Reversible traffic operations (one lane) with bike and pedestrian pathway	0		
Fixed Span Bridge for All Modes	**8**	**Retrofit of Existing Bridge**	**4**	Movable bridge with bikes and pedestrians using the existing bridge	2
Tunnel, with bikes and pedestrians on the existing bridge.	**6**	No Action	2		

General or Corridor Related Comments

- I think the existing location is best.
  - The City Center idea disrupts park and recreation areas south, and comes into a very narrow corridor north.
  - The Bingen idea disrupts homeowners, parks and wetlands.
  - Both of these ideas create new development where quieter areas exist now. This is an undesirable consequence.
- If the new bridge can look attractive, concrete may be the cheapest alternative. Maybe decorate it with natural rocks? Steel looks good. A tunnel might be okay, but expensive.
- We should not have to pay a higher toll than we do now. The old bridge was paid for long ago. We should have a low maintenance one built next time.
- Bikes and pedestrians using the existing bridge is a nice idea, but economically I do not feel that this is feasible.
- A tunnel is not a good option because of the geography and geology of the area. It is too expensive.
- Most desirable is a fixed-span bridge for all modes, either the Existing or East Corridor. City Center is less desirable. The existing bridge is unable to handle present or future motor traffic or bicycle/pedestrian traffic, and it will not be economically feasible to maintain it for bicycle/pedestrian traffic only. This suggests one bridge to replace it which handles all traffic. Tunnel is not economically justifiable.
- I do not like the East A Corridor. It moves people away from Hood River and opens up undeveloped areas. It could be used to access casino.

Comments About Specific Alternatives

- **City Center Corridor:** Fixed Span Bridge, with bikes and pedestrians using the existing bridge
  - Separates vehicles from bikes and pedestrians and keeps historic bridge.
- **City Center Corridor:** Tunnel, with bikes and pedestrians on the existing bridge
  - Would be fun but too expensive.
- **Existing Corridor:** Fixed Span Bridge with bikes and pedestrians using the existing bridge
  - Keeps historic bridge and separates vehicles from bikes/pedestrians.
- **Existing Corridor:** Movable Bridge with bikes and pedestrians using the existing bridge
  - Possible, but now you have to maintain two lift sections.
- **Existing Corridor:** Retrofit of Existing Bridge

  - Makes the most sense.
- **Existing Corridor**: No Action
  - Not feasible. Need to have pedestrian /bike traffic abilities and existing bridge is in disrepair.

E:\Current Projects\0010-SR-35 Bridge Crossing\Public Meetings\Oct2001MeetingSummary.doc

SR-35/COLUMBIA RIVER CROSSING FEASIBILITY STUDY

PUBLIC OPEN HOUSE
Thursday, February 28, 2002

SUMMARY OF COMMENTS

PREPARED MARCH 8, 2002

INTRODUCTION AND OVERVIEW

About 40 people attended this public event to discuss the SR-35 Columbia River Crossing Feasibility Study. The open house was announced in a newsletter distributed directly to about 500 people who have expressed an interest in the project and/or attended previous events. It also was announced in news articles in the *Hood River News* and *White Salmon Enterprise*, as well as in press releases to local newspapers in the Dalles and Skamania County. Notice of the meeting also was posted at the tollbooths on the existing bridge over the Columbia River between Hood River and Washington. Attendees participated in the following activities:

- Reviewed and commented on bridge design concepts for crossing alternatives under consideration
- Viewed an awards ceremony for participants in a youth bridge design contest. Young people between the ages of 5 and 18 received prizes donated by local businesses for winning entries in a contest sponsored by the *Hood River News*, *White Salmon Enterprise*, local cities and counties, and local businesses, including Da Kine, Discover Bicycles, Hood River Outfitters, the Hood River Department of Parks and Recreation, McDonalds, Pietro's Pizza and Wal-Mart.
- Listened to a presentation about the project and participated in subsequent question and answer sessions.

A more detailed description of the presentation and discussion begins on page 7.

SUMMARY OBSERVATIONS

- Relatively few people made comments about specific elements of the alternative bridge designs. Most were concerned more with the location of the alternatives and related issues.

- Comments about crossing locations were related primarily to the East and City Center crossings. Several comments oppose the City Center location, while comments about the East corridor are mixed.
- The consultant team prepared a cable-stay bridge design concept to supplement those from the design workshop, for consideration. This alternative garnered the most comments which were split between highly favorable and strongly negative.
- Specific design features that received positive comments included the delta piers, haunched girders, open railings and arched span, with one person recommending a through-arch.

COMMENTS ON DESIGN CONCEPTS

Participants reviewed and commented on different bridge design concepts in each corridor. Design drawings showed the location and alignment of the alternative, shape and spacing of bridge piers, type of supporting structure (e.g., constant depth or haunched girders, arch or cable stay structures) and other design details. Open house attendees were asked to review the drawings and comment on aspects of the design they liked or disliked. In addition to commenting on design elements, a number of people made general comments about particular locations or other aspects of the alternatives. Comments are shown below by corridor and design alternative.

City Center Corridor – 1200' Arch With Girder Segmental Approach and Wedge Piers

- It looks like this arch could allow boats to pass side by side under the bridge.

City Center Corridor – Tunnel for Vehicles Only

- No comments.

City Center Corridor – Girder Segmental With Tapered Piers

- Forget about using this location – our waterfront is too precious. (*refers to location on Oregon side near Hood River event site*)

City Center Corridor – Haunched Girder Segmental With Tapered Piers

- I liked the haunched girders.
- Do not select an alternative at this location – ruins too much of our waterfront. (*refers to location on Oregon side near Hood River event site*)

City Center Corridor – Cable Stayed With Girder Segmental Approach and Delta Piers

- These design criteria are fine as far as they go, but we will need to see the costs to really decide.

- Ugly. Forget this.
- Most visually appealing design.
- Good to have some superstructure so that it feels like a bridge. (*refers to the cable stay tower*)
- The enormous 500' high tower on the Washington side might "disappear" into the hillside from Hood River, but it would not do so for drivers on the Washington side on State Route 14, nor for residents on the heights, or boat traffic. (*refers to cable stay tower*)

East Corridor –Girder Segmental With Wedge Piers

- No comments.

East Corridor –Arch With Girder Segmental and Wedge Piers

- Is noise an issue? Can it be reduced?
- This design does not intrude on the delineated wetland.
- I like the arch.
- This is a good alignment for the communities of Bingen and White Salmon. It alleviates Oregon side congestion. Good access for Port development. Does not impact wetland setback already delineated.
- I am opposed to this Corridor crossing the west end of Bingen Pond. It is a wildlife haven. (2 comments)
- I oppose the extra two miles this option would add to my daily commute.
- This is the best option (Bingen) because it is shorter distance, less pilings, reduces traffic on Oregon side without major intersection configuration, and has a better link to SR 14 and White Salmon. Could the Oregon interchange be moved slightly west, then ramp up and over Stanley Rock? This would provide plenty of height and further reduce distance and pilings.
- This location makes the most sense for the communities in Washington.

Existing Corridor –Retrofit of Existing Bridge

- The retrofit with elevated center section for boats makes the most sense. A three-mile tunnel makes the least sense.
- How can this option solve the traffic problem on the Oregon side?
- This option would cause severe traffic problems on the Oregon side – I-84 back-ups, toll bridge back-ups.
- Can the SR-14 junction be re-aligned to avoid the Heritage Tree there? (e.g., refers to location where bridge begins to meet with road on Washington side of the river)
- Please try to avoid taking out this great old oak (Heritage Tree). (near where the bridge intersects SR-14 on the Washington side of the river)

Existing Corridor –Girder Segmental With Wedge Piers

- No comments

Existing Corridor –Girder Segmental With Delta Piers

- I like the delta piers with a through arch, like the Alsea Bay Bridge.
- Hug the west side of the current bridge with the new bridge. (*where the bridge meets on Oregon side of the river*)
- Shift the new bridge alignment to west of current bridge. (*where the bridge lands on the Washington side of the river*)
- Keeping the view open by using steel bands on the edge (open railings/guard rails) is very good.

Additional General Comments

Several participants filled out general comment forms. Comments included:

- Use widely spaced piers with minimal lighting – no lift but some superstructure for the bridge; like the feel of the existing corridor best.
- The Hood River area is a large recreation area. It would be wonderful to have the Bridge be a destination and functional with bike and fishing access.
- In order to fit with the local outdoor lifestyle, a pedestrian path really must be incorporated into the design.
- Access for cyclists both recreational and commuter must be included. Local cycling and alternative transportation organizations should be contacted and enlisted to aid in design and funding issues. If the tunnel design is chosen, how long will the old bridge be fit for use? Will the cost of upkeep close this option in time? We must have a long term solution. Movement of the bridge to a different alignment could be detrimental to the income of businesses on the current Hood River Beachhead.
- I'm not sure if this has been addressed but the noise should be mitigated somehow.
- The East (Bingen) corridor must make the most sense when all is considered. It has a shorter distance, fewer pilings, relieves traffic congestion on the Oregon side, on the Washington side hooks up better with SR-14 and White Salmon access. Check with Warm Springs Casino proposal. It would make sense to access the new casino from the Interchange – they may even help pay for it. Could bridge come off the top of the Koberg (Stanley) Rock? This would mean even more height, less distance and fewer pilings.
- Prefer the bridge option with support cables on the Washington side – aesthetically pleasing. Keep decorative lighting and all other forms of light pollution to a minimum.

Presentation

Dale Robins of the Southwest Washington Regional Transportation Council (RTC) and Chuck Green of Parsons Brinckerhoff provided participants with a brief summary and status report for the project, as well as an opportunity to ask questions or make comments.

In 1999, RTC and the State Departments of Transportation for Oregon and Washington formed a Management Team and conducted the first (scoping) phase of the feasibility study. In doing so, they asked residents basic questions: 1) Is there a need for a feasibility study? and 2) What should be considered in the study? This first phase resulted in the scope of work for the feasibility study currently underway. Progress to date on this study includes:

- Identified five preliminary crossing corridors and a broad range of facility types.
- Narrowed the list of crossing corridors to three and the types of facilities to bridges or tunnels.
- Identified 17 preliminary facility alternatives.
- Studied and narrowed the 17 alternatives to seven (7), including a "no-action" alternative.
- Conducted a public opinion survey about the perceived need for a new bridge and other issues (described below).
- Conducted a design workshop to identified bridge and tunnel design concepts.

Dale noted that a recent public opinion survey conducted for the project indicated strong public support for a new/improved bridge. About 65% of respondents say there is a great need for a new or improved bridge; another 15% say there is some need. The survey also indicated that most trips across the existing bridge are for non-work purposes. Most survey respondents are willing to pay a toll of at least $1; slightly over half say they would pay $1.50; slightly under half would pay $2 per trip.

Dale also described a design workshop recently conducted with members of the Local Advisory and Steering Committees for the project. Participants worked in three small groups to identify possible bridge designs for alternatives in each crossing corridor. Results of the groups were very similar, with a consistent desire for a design that fits well within the scenic landscape of the Gorge, but is somewhat decorative.

Dale also briefly described the remaining facility options which include the following:

- **City Center Corridor.** *2nd Street interchange in Hood River to SR-14 in Washington. Alternatives:*
  - New bridge for cars, trucks, bicyclists and pedestrians

- Tunnel for cars and trucks here; existing bridge rebuilt for bicyclists and pedestrians

- **Existing Corridor**. *Approximately same alignment as current bridge. Alternatives:*
  - New bridge for cars, trucks, bicyclists and pedestrians
  - Retrofit existing bridge for cars, trucks, bicyclists and pedestrians
- **East Corridor**. *Connects from I-84 east of Koberg State Park in Oregon to Bingen Point in Washington. Alternatives:*
  - New bridge for cars, trucks, bicyclists and pedestrians
  - New bridge for cars and trucks; existing bridge rebuilt for bicyclists and pedestrians
- **No action.** No new bridge or significant improvements other than currently planned by the Port of Hood River

Next, Chuck Green discussed the next steps in the project, which include the following:

- Evaluate remaining alternatives in more detail.
- Complete an economic/financial feasibility study (based partly on survey results) to help identify how much revenues could be expected from tolls and how much state or federal money would be required for the project.
- Refine cost estimates.
- Narrow the list of alternatives from seven to two or three build alternatives and a no-build option in April and May.
- Review results of technical analysis and project team recommendations with advisory committees in May.
- Discuss results and recommendations with Oregon and Washington Department of Transportation (DOT) Regional Administrators in late May. The Regional Administrators will determine whether to proceed with Tier III/Draft Environmental Impact Statement (DEIS). Tier III would be scheduled to begin in the Summer of 2002 and be completed in the Spring of 2003.

Chuck noted that without the likelihood of significant local funding for a new or improved crossing through tolls or other means, the study may not go forward. At best, local funding sources are likely to pay for only a portion of the cost of a new crossing, with the remainder financed by state and federal funds. Given the heavy competition for funding for transportation projects in both Oregon and Washington, as well as at the national level, a significant local contribution is probably essential for ultimate completion of the project. If the Oregon and Washington DOT Regional Administrators do not believe this is possible, they may not approve the final (third) tier of this study.

Questions and comments followed the presentation (answers are shown in italics)

Question: What is the schedule for the next public meeting?

Answer: It depends on the outcome of the decision by the Regional Administrators. If the study moves forward, the next public meeting likely will be in late spring or early summer. At this point, we do not have another public meeting scheduled for this tier of the study.

Question: If you decide not to build a new bridge, are there other options to improving the existing bridge. What is its useful life?

Answer: There may be some limited, short-term improvements possible such as the addition of traffic signals at either end of the bridge. The Port also is planning some improvement projects, such as replacing the decking.

Question: Would it be possible to get a monthly bridge pass or have an automated toll entry for people who use the bridge frequently?

Answer: *The Port sells discount ticket books now, which save people about 15% of the regular ticket price. The Port has looked into automated toll collection equipment but there are no local companies with the expertise to repair those types of machines because most of them are used on the east coast or in California. The Port also is considering changes in the design of the toll plaza but has not made any decisions about that yet.*

Question: What is the likelihood that you will conduct an EIS? Is there a real chance that you won't?

Answer: Yes. It will depend in large part on the results of the economic/financial feasibility study we are conducting and the relative portion of the cost of a new bridge that could be borne by the local communities. Once that study is completed, we will know more.

Question: I am concerned about bicycle access for both commuting and recreation. What does the finding about potential bicycle use from the survey mean?

Answer: In the survey, we asked people how likely they would have been to make their last trip across the bridge by walking or bicycling if such facilities were available. About 11 to 14% of respondents said they would have been "very likely" to do so; 9 to 13% said they would have been "somewhat likely" to do so.

Question: What is the likelihood that a new bridge would include a pedestrian/ bicycle path.

Answer: All of the options we are studying include a bicycle/pedestrian facility. Federal and state regulations would require such a facility.

Question: Have you looked at federal grant programs for bicycle and pedestrian facilities as possible options for financing?

Answer: We have considered them generally and will consider them in more detail as part of the EIS process, if it is conducted.

Comment: Cycling is very popular in this area, particularly for recreation. It is limited significantly now by the inability for bicyclists to cross the river. Creating a pedestrian/bicycle facility would have a huge local benefit. I am sure you could get strong support from the bicycling community for a new or improved crossing.

Next Mike Traffalis of Parsons Brinckerhoff briefly reviewed the results of a recent bridge inspection study and report prepared for the Port of Hood River. For the most part, the report, which described a "fracture critical" study and an underwater inspection, indicates that the bridge is in fair to good condition. It identified one set of structural members (supporting stringers underneath the bridge deck) that are in need of immediate repair. The Port plans to replace these stringers as part of its deck replacement project scheduled for later this year.

Questions and comments followed the presentation (answers are shown in italics)

Question: Does the inspection report indicate the bridge's current tonnage (weight) rating?

Answer: No. The study did not include stress tests which would be required to identify a tonnage rating. However, the Port conducted such test about five years ago and that information may be available as of that date.

Question: How secure is the overhead gas line attached to the bridge?

Answer: We believe it is very secure. The Port recently replaced all utilities, including that gas line. The utilities were designed to withstand conditions in the Gorge, including flexing by the bridge. As far as we know, the gas line and other utilities are in good working order.

Question: Is the bridge economically viable for the Port?

Answer: *Yes. At this time, the cost of operation and repair does not exceed the revenues from tolls. However, as the bridge gets older, maintenance and repair may cost more than the tolls collected. There are no plans to raise tolls in the near future. The Port is preparing to complete some fairly costly repairs and maintenance work, including spending approximately $7 million to replace the bridge deck and supporting stringers mentioned earlier. The Port assumes the bridge has at least a 20-year life span and its maintenance and improvement plans are based on "rolling" 20-year estimates.*

Question: Is it possible to add a pedestrian/bicycle lane to one of the sides of the bridge?

Answer: Not without major reconstruction of the supporting structure. It would be necessary to add such a cantilevered bike/walking lane to both sides to keep the bridge balanced. The supporting piers of the bridge are not strong enough to support this added weight without reducing the amount of vehicle weight that could cross the bridge. Therefore, adding a bike/pedestrian lane would require

building new supporting piers, which essentially would require rebuilding most of the bridge.

Design Contest results

Arnold Cogan of Cogan Owens Cogan presented awards to winners of a bridge design contest sponsored by the *Hood River News*, *White Salmon Enterprise*, local cities and counties, and local businesses, including Da Kine, Discover Bicycles, Hood River Outfitters, the Hood River Department of Parks and Recreation, McDonalds, Pietro's Pizza and Wal-Mart. Winners included:

Age category 13-18

- ***First Prize***: **Barry Claman**, Hood River Middle School - Gift certificate from Hood River Outfitters and gift from Da Kine

Age Category 9-12

- ***First Prize***: **Breanna Moreau**, White Salmon - Gift certificate from Wal-Mart
- ***Second Prize***: **Roberto Nunez**, Westside Elementary School in Hood River – Large pizza, salad bar and pitcher of soda from Pietro's Pizza

Age Category 5-8

- ***First Prize***: **Parker Young**, Hood River - Gift certificate from Discover Bicycles
- ***Second Prize***: **Logan Carlstrom**, Hood River - Large pizza, salad bar and pitcher of soda from Pietro's Pizza
- ***Third Prize***: **Kevin Harris**, Hood River - Gift certificate from Wal-Mart

Special Awards:

- ***"Most Exciting and Thrilling Crossing:"*** **Chase Young**, Hood River – Swim pass for the Hood River Aquatics Center
- ***"Strongest Bridge/Most Likely to Become an Engineer."*** **Grant Young** - Hood River – Swim pass for the Hood River Aquatics Center

All participants also received a certificate good for a free hamburger at McDonalds in Bingen or Hood River

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SR-35/COLUMBIA RIVER CROSSING FEASIBILITY STUDY

RESOURCE REGULATORY COMMITTEE MEETING SUMMARY
Thursday, February 28, 2002

Prepared March 8, 2002

ATTENDEES

Committee Members: Kelly Craig, Washington Department of Ecology; Jack Wyles, Area Manager, Oregon Parks and Recreation Department (OPRD); Jeanette Kloos, Oregon Department of Transportation; Bob Newman, Washington Department of Fish and Wildlife (WDFW); Eric Holman, WDFW

Project Team: Arnold Cogan, Angela Findley, Chuck Green, Matt Hastie, Paul Korsmo, Michael Ray, Dale Robins, Mike Traffalis

INTRODUCTION AND OVERVIEW

Arnold Cogan, *Cogan Owens Cogan*, opened the meeting with introductions and a description of the meeting's objectives – to update participants on status of the project and discuss the process of evaluating and narrowing alternatives.

Next, Dale Robins, *Southwest Washington Regional Transportation Council (RTC)*, provided a brief summary of the background of the project and recent activities. He noted that a recent public opinion survey conducted for the project indicated strong public support for a new/improved bridge. About 65% of respondents say there is a great need for a new or improved bridge; another 15% say there is some need. The survey also indicates that most trips across the existing bridge are for non-work purposes. Most survey respondents are willing to pay a toll of at least $1; slightly over half say they would pay $1.50; slightly under half would pay $2 per trip.

Dale also described a design workshop recently conducted with members of the Local Advisory and Steering Committees for the project. Participants worked in three small groups to identify possible bridge designs for alternatives in each crossing corridor. Results of the groups were very similar, with a consistent desire for a design that fits well within the scenic landscape of the Gorge, but is somewhat decorative.

Dale also briefly described the consulting team's progress in narrowing the number of alternatives under consideration from 17 to 7 (including a no-action alternative), based on technical analysis and guidance from the Local Advisory Committee, Steering Committee, members of the public and Oregon and Washington Departments of Transportation regional administrators. This process is described in more detail later in this summary.

CONCURRENCE PROCESS AND EVALUATION CRITERIA

Angela Findley gave a brief update on the status of the concurrence process with state and federal streamlining agencies in Oregon and Washington. The Oregon CETAS and Washington State Agency Coordination (SAC) groups have reviewed and commented on the proposed Purpose and Need statement for the project. Most comments may be addressed in a revised Purpose and Need statement, and a few outstanding comments still need to be discussed and resolved. Criteria for selection of alternatives to be studied in a Draft Environmental Impact Statement (DEIS) also have been developed and sent to CETAS and SAC representatives for review, comment and concurrence. Several agencies have responded and Angela is in the process of obtaining comments from remaining representatives. Angela noted that the criteria are related to the objectives identified in the project's purpose and need statement and cover a broad range of possible impacts including environmental, economic, cultural resource, social and transportation impacts, among others. The criteria were based on preliminary measures previously reviewed by members of the RRC, and were expanded to address initial committee concerns to adequately address environmental and other factors.

EVALUATION PROCESS

Chuck Green reviewed the results of the evaluation narrowing of 17 alternatives to the remaining seven (7). The criteria described by Angela were used to review the alternatives. Evaluation was based on existing and new preliminary data. Much of the analysis is comparative and qualitative, while some criteria are more quantitative (e.g., impacts on vehicle miles traveled). For each criterion, the project team used a high, medium, low level of impact rating system to compare the alternatives. Examples include:

- Impacts related to vehicle miles traveled (VMTs) are higher for some corridors and for the tunnel alternative because they require people to travel longer distances due to out-of-direction travel or, in the case of the tunnel, to descend below the river and rise above it on the other side.
- Impacts on endangered fish species would vary by alternative. Those facilities that could cast larger shadows over the water (e.g., a floating bridge or multiple bridges)

would have higher environmental impacts because of the potential for fish predation in shaded areas.

- Land use impacts potentially would be higher for options located outside of urban areas because of the potential for induced development in those locations and because of Oregon statewide planning goal exceptions.
- Recreation impacts are expected to be higher for the City Center alternative, given potential impacts on major windsurfing sites (e.g., the Hood River Events site).

In October 2001, the project team reviewed the results of technical analysis and recommendations for narrowing alternatives with members of the Local Advisory Committee (LAC); their recommendations were forwarded to the Steering Committee (SC) and members of the public at a public open house. Results and recommendations were then presented to the DOT Regional Administrators in December 2001. The Regional Administrators identified six build alternatives and one no-build option to move forward in the study. One of the alternatives is a proposed retrofit of the existing bridge. This would require construction of new piers and additional new understructure (truss) to accommodate a wider, heavier deck built to accommodate all modes of traffic. This would be built parallel to the existing bridge with the truss structure from the existing bridge lifted and placed on the new piers.

DISCUSSION

Questions and answers followed the presentation by Chuck Green. Answers from staff and consultants are shown in *italics*.

Question: I do not see a specific reference to National Scenic Area (NSA) regulations. How do they fit in?

Answer: *They are incorporated in the evaluation of visual and land use impacts.*

Question: Would the East Alternative close access to Koberg State Park and the in-lieu fishing site there?

Answer: *No. We would maintain that access and connect to it via the freeway interchange. However, there would be no additional land access beyond a possible connection to a pedestrian/bicycle trail between that location and the City of Hood River.*

Comment: I do not think trail access exists except via the Columbia River Historic Highway which is significantly higher than I-84 (possibly several hundred feet). You may need to take a closer look at that potential connection.

Question: Does the East alternative include a pedestrian/bicycle pathway on the bridge span?

Answer: *Yes.*

Question: Would it connect to Koberg State Park?

Answer: *Possibly. It would require a pedestrian/bicycle connection to Hood River. We could try to incorporate the connection to Koberg State Park as part of that trail. There is a question of whether this project would be responsible for creating/ financing a pedestrian/bicycle connection between the bridge and the City of Hood River.*

Question: Are you looking at state and federal grants related to alternative modes as a possible source of funding?

Answer: *Yes. We will look into that as part of the economic/financial feasibility study, but the focus of that analysis will be the potential extent of local matching funds. If we proceed into Tier III and prepare a DEIS, then we will identify a range of funding sources, including enhancement, TEA-21 grants for alternative modes projects, etc. as part of the project's financial and implementation plan.*

Comment: If your maps and drawings show a pedestrian/bicycle facility that may not be built, it is important to explain that to people.

Answer: *Any facility would have an associated pedestrian/bicycle facility as part of the crossing. However, it is unclear the extent to which this project would also entail construction of a pedestrian/bicycle facility between the crossing and adjacent communities. Pedestrian/bicycle connectivity is one of our evaluation criteria and was part of the impetus for this study.*

Answer: *We also would need to evaluate this connectivity issue in the EIS. There already is a planned pedestrian/bicycle connection on the Washington side of the river between Bingen and the existing bridge.*

Comment: It is legal to ride bikes on the shoulder of I-84 so I-84 would represent a potential bicycle connection from the East Corridor. However, it might not be the most preferable bicycle connection and may not be a viable pedestrian connection.

Comment: The East corridor is the least favorite from the perspective of the Washington State Department of Fish and Wildlife (WFWL) due to possible impacts on wildlife in the Bingen Pond area.

Answer: *We have received and noted similar comments from the Oregon Department of Fish and Wildlife (ODFW) and United States Fish and Wildlife Service (USFWS). The Audubon Society also has raised similar issues.*

Question: I do not see any references to permitting issues.

Answer: *We will create a list of permitting issues and requirements during the DEIS process if it is undertaken. The objective of the streamlining process is to incorporate permitting issues in the planning stage.*

NEXT STEPS

Within the next two months, the project team expects to narrow the alternatives from six to two or three action alternatives for possible evaluation in a DEIS. The no action alternative will be carried automatically into the DEIS. The evaluation criteria described by Angela Findley will be used for this narrowing process. The remaining alternatives may be located in one or two corridors.

Other next steps include:

- More evaluation of technical information.
- Economic/financial feasibility study (based partly on survey results) to help us identify how much revenue could be expected from tolls and how much state or federal money would be required for the project.
- Refining cost estimates.
- Narrow the list of alternatives in April and May.
- Review results of technical analysis and project team recommendations with advisory committees in May.
- Apprise Resource Regulatory Committee (RRC) of recommendations in May.
- Discuss with Regional Administrators in late May. The Regional Administrators will determine whether to proceed with Tier III/Draft Environmental Impact Statement (DEIS). Tier III would be scheduled for Summer 2002 to Spring 2003.
- The next concurrence point for the streamlining agencies will be to review alternatives to evaluate in the DEIS (late spring of this year).

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N E W S R E L E A S E

July 26, 2001

FOR IMMEDIATE RELEASE

CONTACT: Dale Robins
(360) 397-6067

Options Narrowed for SR-35 Columbia River Crossing Study

Vancouver, WA. – The first tier of a study of possible future improvements to the Columbia River Crossing between Hood River, Oregon and Bingen/White Salmon Washington has just been completed. The study is being undertaken by the Southwest Washington Regional Transportation Council (RTC), Washington State Department of Transportation (WSDOT) and Oregon Department of Transportation (ODOT), in coordination with the Federal Highway Administration (FHWA). During the last several months, the management and consulting team working on the project evaluated and narrowed a preliminary list of crossing corridors. Members of the public and local appointed and elected officials, including three project advisory committees, have played a critical role in commenting on the initial corridor screening and identifying options to be studied further.

The following crossing corridors **have been recommended for further study**:

- **City Center,** connecting the 2nd Street interchange in Hood River to SR-14 in Washington.
- **Existing Low**, approximately the same alignment as the current bridge.
- **East A** connecting Koberg State Park in Oregon to Bingen Point in Washington.

Three other corridors **will not be studied further**, including:

- **West**, connecting I-84 near the West Hood River interchange in Oregon to SR-14 in Washington.
- **Existing High**, approximately the same alignment as the current bridge at a higher elevation; connecting Button Junction to Jewett Boulevard (SR-141).
- **East B**, located east of the East A corridor, near Reese's Mill in Washington.

The following types of facilities will be studied. One or more may be evaluated in each of the corridors identified for further study.

- **Bridges,** including:
  - Re-use of the existing bridge with improvements, as a stand-alone facility or a companion to a new facility.
  - New floating bridge.
  - New low-level bridge with a "lift span" similar to the existing bridge.

  - New high-level “jump span” bridge that would meet horizontal and vertical clearance requirements for river traffic without a movable lift span.
- **Tunnels**, including:
  - “Cut-and-cover,” a shallow tunnel generally used only over dry land.
  - Immersed tube, built and placed in a trough in the river bottom.
  - Bored, created by boring a hole underneath the river.

A “No-Build” alternative will be carried forward throughout the process of evaluating alternatives.

During the next several months, the project team will identify and study specific alternatives, narrowing them to a shorter list of the most promising options for more detailed analysis. Members of the public are encouraged to participate in the study through advisory committee meetings, a random sample survey, community group presentations, public open houses and other means. The next advisory committee meetings are scheduled for this September.

Additional information also can be obtained at the project web site: www.rtc.wa.gov/studies/sr35 or by calling Dale Robins at 360-397-6067.

# # #

N E W S R E L E A S E

September 6, 2001

FOR IMMEDIATE RELEASE

CONTACT: Dale Robins
(360) 397-6067

Advisory Committee Meetings for SR-35 Columbia River Crossing Study Scheduled

Vancouver, WA. – A **Local Advisory Committee** of citizens will meet on **September 13th** from **6 to 8 p.m.** to review and discuss alternative crossings being evaluated as part of this two-year study. The public is welcome to attend the meeting, to be held in the small conference room at the **Expo Center in Hood River**. The Expo Center is located on Portway Avenue. The meeting is sponsored by the Southwest Washington Regional Transportation Council, in partnership with the Oregon and Washington Departments of Transportation and local cities and counties.

At the meeting, members of the committee will review the results of a preliminary analysis of crossing alternatives and recommend those that should be evaluated further. Alternatives include different bridge and tunnel designs being considered at three different locations on the river. The Local Advisory Committee's recommendation will be presented to the project Steering Committee of elected and appointed officials when they meet on September 20th, 2001 from 3 to 5 p.m., also at the Expo Center.

Results of the analysis and committee recommendations will be presented to the public at an open house tentatively scheduled for early October. Throughout the project, residents and business owners on both sides of the river will have additional opportunities to be involved through community events, questionnaires, newsletters, a youth project, public displays and other means.

# # #

N E W S R E L E A S E

October 3, 2001

FOR IMMEDIATE RELEASE

CONTACT: Dale Robins
(360) 397-6067

Public Open House for SR-35 Columbia River Crossing Study Scheduled for October 11, 2001

Vancouver, WA. – The public is invited to an open house on **October 11, from 5 to 8 p.m. at Fidel's at the Gorge** (restaurant), SR 14 at 120 East Steuben, **Bingen, Washington**, to review and comment on an evaluation of possible alternative Columbia River crossing facilities. The event is sponsored by the Southwest Washington Regional Transportation Council, in partnership with the Oregon and Washington Departments of Transportation and local cities and counties. Information also will be available about a proposed widening project for State Route 14 (SR-14) between the Hood River Bridge and Bingen, Washington.

Alternatives under consideration in the river crossing study include different types of bridges or tunnels located in these three potential locations:

- **City Center Corridor**, approximately one-half mile west of the existing bridge, connecting SR-14 in Washington to I-84 near the City Center (2nd Street) interchange in Hood River.
- **Existing Corridor**, adjacent to or in the same place as the current bridge.
- **East Corridor**, about three-quarters of a mile east of the existing bridge, from I-84 near Stanley Rock to Bingen Point.

Two other corridors studied earlier in the process have been eliminated from consideration. During the last several months, the project team has analyzed 17 alternatives and is recommending eight (8) of them be studied in more detail. In future rounds of evaluation, the number of alternatives will be narrowed further; eventually, one preferred alternative may be recommended for construction.

Members of the project team will be available to answer questions about the project and listen to comments. Members of the public are welcome to attend any time between 5 and 8 p.m.

Anyone who cannot attend the meeting is welcome to send comments or suggestions to Dale Robins, Project Manager, Southwest Washington Regional Transportation Council, 1351 Officers Row, Vancouver, WA 98661, Telephone: 360-397-6067. Additional information also can be obtained at the project web site: www.rtc.wa.gov/studies/sr35.

# # #

N E W S R E L E A S E

October 15, 2001

FOR IMMEDIATE RELEASE

CONTACT: Dale Robins
(360) 397-6067

Research Firm to Conduct Opinion Survey for Columbia River Crossing Study

Vancouver, WA. – To assist with a feasibility study of potential improvements to the Hood River bridge, a survey research firm will conduct a "random sample" survey of local residents and other bridge users in October, 2001. The firm will conduct a random sample telephone survey of residents in and around Bingen, Hood River and White Salmon during the second two weeks in October. The survey will take about five minutes to complete. On October 21st and 22nd (Sunday and Monday), the firm also will conduct an "intercept" survey of bridge users. They will ask randomly selected people driving over the bridge to volunteer to pull over and complete a two to three minute verbal questionnaire. Use of signs, flagging and other steps will be taken to avoid any traffic delays or confusion for people crossing the bridge on those days.

Survey topics will include:

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

All individual responses to the survey will be kept confidential. Results will be made available early next year, including at a public open house tentatively scheduled for February 2002. Questions about the survey can be directed to Dale Robins at the Southwest Washington Regional Transportation Council (360-397-6067). Additional information about the river crossing study also can be obtained at the project web site: www.rtc.wa.gov/studies/sr35.

# # #

HELP US DESIGN A NEW BRIDGE OR TUNNEL!

BRIDGE/TUNNEL DESIGN CONTEST

How Do I Enter?

Draw a picture of a new or improved bridge or tunnel over the Columbia River between Hood River and White Salmon/Bingen – entries should be no larger than 11 inches by 17 inches. Entries should be sent to the Southwest Washington Regional Transportation Council (see address below) and postmarked by February 16, 2002.

Who Can Enter?

Anyone between the ages of 5 and 18 who lives within the Hood River, White Salmon or Bingen area.

Are There Prizes?

Prizes from local sponsors will be awarded for 1st, 2nd and 3rd place winners in three age groups: 5 – 8, 9 – 12, 13 – 18. They will be awarded at an open house on February 28, where all entries will be displayed. Winners' names will be announced in the Hood River News and White Salmon Enterprise. Winning entries also will be displayed in community gathering places and businesses. Everyone who submits an entry will receive a token of appreciation.

Are There Any Other Rules or Requirements?

No. Entries will be judged on the basis of creativity and imagination. Local judges are being selected.

For further information contact Loreene O'Neill, Cogan Owens Cogan, 503/225-0192

The contest is being sponsored by:
The Southwest Washington Regional Transportation Council (RTC) and Oregon and Washington State Departments of Transportation
The Hood River News and White Salmon Enterprise
The Cities of Hood River, White Salmon and Bingen and Hood River, Skamania and Klickitat Counties

YOU ARE INVITED TO HELP US DESIGN A NEW BRIDGE OR TUNNEL!

What do you think a new bridge or tunnel across the Columbia River should look like? We are holding a youth design contest to get your ideas as a part of an on-going study of alternatives for a new or improved crossing.

You are eligible to enter if you are between the ages of 5 and 18 and live within 10 miles of Hood River, White Salmon or Bingen. All entrants will receive a token of appreciation and prizes will be awarded for 1st, 2nd and 3rd place winners in each age category. The winners will be announced at an open house on February 28, 2002. Entries will be judged on the basis of creativity and imagination.

To enter, fill out the form below and return it, post marked by February 16, with your drawing to:

Youth Design Contest
Southwest Washington RTC
1351 Officers Row
Vancouver, WA 98661

Drawings should be no larger than 11 inches by 17 inches.

For further information contact Loreene O'Neill, Cogan Owens Cogan, 503/225-0192.

Name: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Phone: _____ Birth date: _____Age:_____ Grade:_____

School: _____

Age Category: ○ 5-8 ○ 9-12 ○ 13-18

SR-35 Bridge Design Contest Prize Winners List

Age category 13-18

- ***First Prize***: **Barry Claman**, Hood River Middle School - Gift certificate from Hood River Outfitters and gift from Da Kine **(#6)**

Age Category 9-12

- ***First Prize***: **Breanna Moreau**, White Salmon - Gift certificate from WalMart **(#5)**
- ***Second Prize***: **Roberto Nunez**, Westside Elementary School in Hood River – Large pizza, salad bar and pitcher of soda from Pietro's Pizza **(#3)**

Age Category 5-8

- ***First Prize***: **Parker Young**, Hood River - Gift certificate from Discover Bicycles **(#8)**
- ***Second Prize***: **Logan Carlstrom**, Hood River - Large pizza, salad bar and pitcher of soda from Pietro's Pizza **(#7)**
- ***Third Prize***: **Kevin Harris**, Hood River - Gift certificate from WalMart **(#4)**

Special Awards:

- ***"Most Exciting and Thrilling Crossing:"*** **Chase Young**, Hood River – Swim pass for the Hood River Aquatics Center **(#1)**
- ***"Strongest Bridge/Most Likely to Become an Engineer."*** **Grant Young** - Hood River – Swim pass for the Hood River Aquatics Center **(#2)**

Appendix B – Cost Estimates

Table of Contents

SR-35 Tier II Technical Memorandum
Cost Estimates

Cost Methodology

Each of the alternatives that were developed for evaluation had conceptual engineering plans and profiles developed for the various corridor locations. In each of the corridors, there were a number of possible structure types and configurations defined which represented structures with different lengths and/or design features (different types and location for piers, different superstructure types, etc.). Quantities were developed from the conceptual plan and profile drawings, including typical sections, for each of the major construction components. These quantities were specific to each of the corridor alternatives. Unit cost for the various quantities were then developed from historical cost data for similar projects and checked against current bid data available from both Oregon and Washington State Department of Transportation web sites. For approach work and other ancillary work on each side of the proposed bridge structures, typical section composite unit costs were developed and applied based on the quantity of approach work indicated on the conceptual plans. Summaries for each of the alternatives were then developed listing estimated cost in 2002 dollars by major construction category. Percentage markups were then added for engineering, construction management, and contingency in order to arrive at a total project cost.

Long-Term Alternative Descriptions

General structural descriptions are conceptualized for the various corridors described below:

City Center Alignment

Cable Stayed with Girder Segmental Approach and Delta Piers

This bridge is conceptualized as a 6-span, cable-stayed, main span with steel girder approach span for the superstructure. Substructures are delta piers, which are single-column from water line to a point 20 feet above water line, then splitting into Y or delta shape connecting with superstructure. Span arrangement is estimated, from south to north as 1 span at 430 feet, 1 span at 510 feet, 1 span at 530 feet, 1 span at 550 feet, 1 span at 560 feet, and 1 span at 1,600 feet, for a total bridge length of 4,180 feet. The main tower supporting the cable-stayed 1,600-foot span is concrete and has an approximate height of 500 feet above the water. In addition, the tower is conceptualized to be inclined at 60 degrees. Connection with SR-14 is at grade with minor existing intersection improvements and the connection with I-84 utilizes the existing interchange.

Tied Arch with Girder Segmental Approach and Wedge Piers

This Bridge is conceptualized as a 8-span, tied-arch, with steel girder superstructure. Substructure is Wedge Piers, which are single-column piers where the downstream pier elevation is a smaller width than the upstream side. Span arrangement is estimated, from south to north as 1 span at 300 feet, 5 spans at 500 feet, 1 span at 600 feet, and 1 span at 560 feet, for a total bridge length of 3,960 feet. The main tied arch span is

centered over the navigation channel. Connection with SR-14 is at grade with minor existing intersection improvements and the connection with I-84 utilizes the existing interchange.

Concrete Haunch Girder Segmental with Tapered Piers

This bridge is conceptualized as a 10-span, concrete-haunched, concrete girder with concrete deck superstructure and tapered (smaller cross-section at column top with larger cross-section at column bottom) piers for substructure. Span arrangement is estimated, from south to north, as 1 span at 275 feet, 8 spans at 450 feet, and 1 span at 400 feet, for a total bridge length of 4,275 feet. Connections with SR-14 and I-84 are at grade with minor existing intersection/interchange improvement.

Steel Girder Segmental with Tapered Piers

This bridge is conceptualized as a 9-span, steel girder superstructure, and tapered (smaller cross-section at pier top with larger cross-section at pier bottom) pier substructure. Span arrangement is estimated, from south to north, as 1 span at 300 feet, 7 spans at 500 feet, and 1 span at 340 feet, for a total length of 4,140 feet. Connections with local roadways are at grade connections, with interchange improvements not anticipated at I-84 or SR-14.

Twin Boring Tunnel

The conceptualized twin-bored tunnel is comprised of a cut-and-cover tunnel segment through the Port of Hood River area, transitioning to twin 30-foot-diameter bores under the river and on the Washington side. The tunnel invert (bottom of tunnel) could be as deep as 70 feet below the bottom of the river, thus requiring the cut-and-cover segment (open trench excavation and land above reclaimed after tunnel is completed) to start at grade and spiral down to achieve the necessary clearance for the tunnel boring to start. The river, being deepest along the north bank, causes the tunnel to start a transition upward at the Washington State line. Being so deep at this point, it takes nearly twice the length of any bridge option to daylight with SR-14. This extra distance the tunnel has to travel, compared to a bridge crossing, results in a tunnel approximately three times the length and cost of any bridge.

Existing Alignment

Girder Segmental with Wedge Piers

This bridge is conceptualized as a 15-span concrete superstructure and wedge (downstream pier elevation is a smaller width than the upstream side) piers for substructure. Span arrangement is estimated, from south to north, as 1 span at 260 feet, 13 spans at 300 feet, and 1 span at 90 feet, for a total bridge length of 4,250 feet. Connections with SR-14 and I-84 are at grade with minor existing intersection/ interchange improvements.

Girder Segmental with Delta Piers

This bridge is conceptualized as a 12-span, concrete haunched superstructure and delta (single pier from water line to a point 20 feet above water line, then splitting into Y

or delta shape connecting with superstructure) piers for substructure. Span arrangement is estimated, from south to north, as 1 span at 250 feet, 1 span at 330 feet, 1 span at 340 feet, 1 span at 365 feet, 1 span at 370 feet, 1 span at 380 feet, 1 span at 385 feet, 1 span at 370, 1 span at 365, 1 span at 360 feet, 1 span at 350 feet, and 1 span at 160 feet, for a total bridge length of 4,025 feet. Connections with SR-14 and I-84 are at grade with minor existing intersection/interchange improvements.

Retrofit Existing Bridge

The existing bridge will need to be widened to accommodate all traffic modes, plus a profile reconfiguration to update the bridge for navigational needs. The concept plan calls for constructing a parallel series of piers (upstream) on a higher profile to eliminate the need of the moveable span. The substructure could consist of twin piers with a common bent cap. After the new series of piers/caps are constructed, a new 32-foot-wide truss (similar to the existing) is placed on top of the new columns. This will allow the existing traffic to be switched over to the new half-width bridge. After switching traffic, the existing bridge would be demolished, salvaging the existing truss superstructure. The existing truss would be moved off site, cleaned, repainted, and placed adjacent to the new half-width bridge. The two trusses would then be joined to complete the full roadway. The span that replaces the existing moveable span and increases the shipping channel clearance is conceptualized as a 680-foot, tied-arch span. Span arrangement for the re-profiled, retrofitted bridge is 9 spans at 210 feet, 1 span at 680 feet, and 7 spans at 210 feet; for a total length of 4,040 feet.

East Alignment

Girder Segmental with Wedge Piers

This bridge is conceptualized as a 7-span, steel girder superstructure and wedge (downstream elevation of pier smaller than up stream elevation) piers for substructure. Span arrangement is estimated at 1 span at 480 feet, 5 spans at 500 feet, and 1 span at 230 feet, for a total length of 3,210 feet. Connection with I-84 is estimated as a new interchange, and access to SR-14 is via a new tunnel under BNSF tracks with an at-grade connection with SR-14 (including the Cedar Street Improvement Project). The 10-foot-wide pedestrian path has an additional cost associated with continuing the trail in Oregon along I-84 back to Hood River.

Arch with Girder Segmental Approach and Wedge Piers

This bridge is conceptualized as a 10-span, tied-arch with concrete girder with composite concrete deck superstructure. Substructure is wedge piers, which are single-column piers where the downstream pier elevation is a smaller width than the upstream side. Span arrangement is estimated, from south to north as 1 span at 190 feet, 4 spans at 300 feet, 1 span at 600 feet, and 4 spans at 300 feet, for a total length of 3,190 feet. The main tied-arch span is centered over the navigation channel. Connection with SR-14 is at-grade and includes the Cedar Street Improvement Project of tunneling under the BNSF track. The connection with I-84 requires a new interchanges.

Hybrids to East Alignments

Hybrids to the East Alignments listed above, include building a new car-only crossing and retrofitting the existing bridge for pedestrians and bikes. This will remove 10 feet of new bridge width and add the cost of retrofitting the existing to each alternative. The cost savings of eliminating 10 feet of walkway for either alternative is approximately $10 million, and the added cost of retrofitting the existing is approximating $60 million; as this is likely to increase the cost of either east alterative by $50 million, a more in-depth cost analysis was not performed.

Roadway Width Alternatives

65-Foot Roadway Section

The 65-foot roadway section consists of a 10-foot pedestrian and bike path, with two 8-foot shoulders and three 12-foot travel lanes along the downstream side of any alternative.

45-Foot Roadway Section

The 45-foot roadway section consists of a 10-foot pedestrian and bike path, with two 4-foot shoulders and two 12-foot travel lanes along the downstream side of any alternative. This option is conceptualized to accommodate a future 5-foot pedestrian and bike-only widening. This will provide the necessary added width to restripe the lanes to a 10-foot pedestrian and bike path, two 2-foot shoulders, and three 11-foot travel lanes.

Short-Term Alternative Descriptions

Existing Alignment

The short-term alternative provides for traffic improvements, on the Oregon side at the I-84 interchange and along the approach road to the existing bridge. Four short-term projects have been identified to remedy the currant traffic issues, they are:

- Construct a roundabout at the eastbound on- and off-ramps with I-84;
- Construct a signalized intersection at the westbound on- and off-ramps at I-84;
- Close the driveway access just north of the Texaco gas station; and
- Reconstruct the tollbooth. Upgrade includes:
    - Automated toll collection capabilities; and
    - One-way toll collection (southbound).

Summary of Cost

See cost spread sheets.

Plan and Elevation of Alternatives

See conceptual plan sheets.

Short- and Mid-Term Improvements

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
PROJECT NO.: 13884
DATE: 5/14/2014
ESTIMATOR: R. HARBUCK

CONCEPTUAL COST ESTIMATE
Summary of Alignments - Short Term Options
(2002 Dollars in Millions)

Major Construction Item	Existing Corridor Add Roadway and Toll Facility Improvements
RETROFIT TOLL FACILITY*	$0.10
ROUNDABOUT AT EASTBOUND RAMPS	$0.27
SUBTOTAL CONSTRUCTION COST	**$0.37**
ENGINEERING: 10%	$0.04
CONSTRUCTION MANAGEMENT: 15%	$0.06
CONTINGENCIES: 30%	$0.11
TOTAL PROJECT COST	**$0.57**

NOTE:
Cost above do not include any allowance for right-of-way acquisition or environmental mitigation.
* For a cost of $100,000, the existing toll booth could be retrofited for one-way toll collection without automated toll collection.

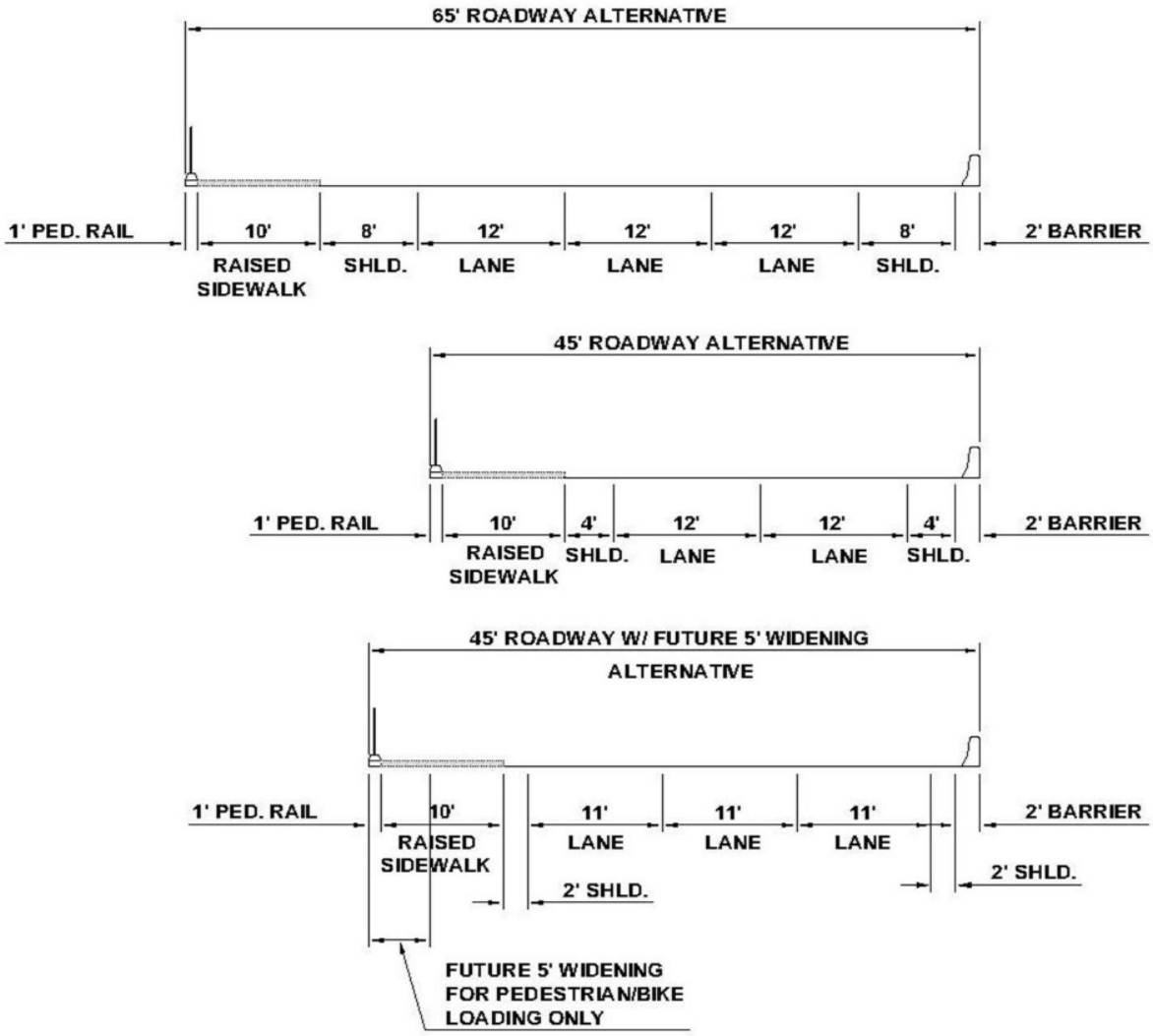
PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
PROJECT NO.: 13884
DATE: 5/14/2014
ESTIMATOR: R. HARBUCK

CONCEPTUAL COST ESTIMATE
Summary of Alignments - Mid Term Options
(2002 Dollars in Millions)

Major Construction Item	Existing Corridor Add Roadway and Toll Facility Improvements
SIGNALIZE WESTBOUND RAMPS	$0.16
ROUNABOUT AT E MARINA WAY	$0.27
MODIFY DRIVEWAY	$0.02
RECONSTRUCT TOLL FACILITY	$0.75
SIGNALIZE SR 14 INTERSECTION	$0.16
SUBTOTAL CONSTRUCTION COST	**$1.36**
ENGINEERING: 10%	$0.14
CONSTRUCTION MANAGEMENT: 15%	$0.20
CONTINGENCIES: 30%	$0.41
TOTAL PROJECT COST	**$2.11**

NOTE:
Cost above do not include any allowance for right-of-way acquisition or environmental mitigation.

Long-Term Alternatives


65' ROADWAY ALTERNATIVE
1' PED. RAIL
10'
RAISED SIDEWALK
8'
SHLD.
12'
LANE
12'
LANE
12'
LANE
8'
SHLD.
2' BARRIER
45' ROADWAY ALTERNATIVE
1' PED. RAIL
10'
RAISED SIDEWALK
4'
SHLD.
12'
LANE
12'
LANE
4'
SHLD.
2' BARRIER
45' ROADWAY W/ FUTURE 5' WIDENING ALTERNATIVE
1' PED. RAIL
10'
RAISED SIDEWALK
11'
LANE
11'
LANE
11'
LANE
2' BARRIER
2' SHLD.
2' SHLD.
FUTURE 5' WIDENING FOR PEDESTRIAN/BIKE LOADING ONLY

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
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DATE: 5/14/2014
ESTIMATOR: R. HARBUCK

CONCEPTUAL COST ESTIMATE
Summary of Alignments - Existing Coridor
(2002 Dollars in Millions)

Major Construction Item	Existing Corridor		
	Girder Segmental with Wedge Piers	Girder Segmental with Delta Piers	Retrofit of Existing Bridge
DEMOLISH EXISTING BRIDGE	$9.8	$9.8	$2.6
EMBANKMENT	$1.7	$1.5	$0.8
ABUTMENT	$2.3	$2.3	$2.3
BRIDGE STRUCTURE	$68.8	$60.2	$89.9
SYSTEMS (TOLLS, SIGNAGE, ETC.)	$10.0	$10.0	$10.0
SR35 / I-84 IMPROVEMENTS	$5.0	$5.0	$5.0
SUBTOTAL CONSTRUCTION COST	**$97.6**	**$88.8**	**$110.6**
ENGINEERING: 10%	$9.8	$8.9	$11.1
CONSTRUCTION MANAGEMENT: 15%	$14.6	$13.3	$16.6
CONTINGENCIES: 30%	$29.3	$26.6	$33.2
TOTAL PROJECT COST - 65-feet	**$151.3**	**$137.6**	**$171.5**
TOTAL PROJECT COST - 45-feet	**$121.0**	**$110.1**	**$137.2**

NOTES:
1) Cost above do not include any allowance for right-of-way acquisition or environmental mitigation.
2) Estimate based on roadway width of 65 feet (3 lanes at 12', 2-8' shoulders, 1- 10' walkway, and barriers)
3) For a narrower roadway width, 45' (2 lanes at 12', 2-4' shoulders, 1-10' walkway, and barriers) apply 20% cost reduction to values shown above
4) 45' roadway section can be modified in the future by widening 5 feet and re-stripe for 3 lane, see Roadway Width Alternatives
5) Retrofit exsitng alterntive is based on an ultimate roadway width of 50 feet.

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
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DATE: 5/14/2014
ESTIMATOR: R. HARBUCK

CONCEPTUAL COST ESTIMATE
Summary of Alignments - East Corridor
(2002 Dollars in Millions)

Major Construction Item	East Corridor	
	Girder Segmental with Wedge Piers	Arch with Girder Segmental Approach and Wedge Piers
DEMOLISH EXISTING BRIDGE	$9.8	$9.8
INTERCHANGE (w/ I-84)	$20.0	$20.0
CEDAR STREET TUNNEL BNSF	$10.5	$10.5
EMBANKMENT	$1.2	$1.2
ABUTMENT	$2.3	$2.3
BRIDGE STRUCTURE	$48.8	$59.7
PED/BIKEWAY TO CITY CENTER	$1.4	$1.4
SYSTEMS (TOLLS, SIGNAGE, ETC.)	$10.0	$10.0
SUBTOTAL CONSTRUCTION COST	**$103.9**	**$114.9**
ENGINEERING: 10%	$10.4	$11.5
CONSTRUCTION MANAGEMENT: 15%	$15.6	$17.2
CONTINGENCIES: 30%	$31.2	$34.5
TOTAL PROJECT COST - 65-feet	**$161.1**	**$178.1**
TOTAL PROJECT COST - 45-feet	**$128.9**	**$142.4**

NOTES:
1) Cost above do not include any allowance for right-of-way acquisition or environmental mitigation.
2) Estimate based on roadway width of 65 feet (3 lanes at 12', 2-8' shoulders, 1- 10' walkway, and barriers)
3) For a narrower roadway width, 45' (2 lanes at 12', 2-4' shoulders, 1-10' walkway, and barriers) apply 20% cost reduction to values shown above
4) 45' roadway section can be modified in the future by widening 5 feet and re-stripe for 3 lane, see Roadway Width Alternatives
5) Retrofit exsitng alterntive is based on an ultimate roadway width of 50 feet.

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
PROJECT NO.: 13884
DATE: 5/14/2014
ESTIMATOR: R. HARBUCK

CONCEPTUAL COST ESTIMATE
Summary of Alignments - City Center Corridor
(2002 Dollars in Millions)

Major Construction Item	City Center Corridor			
	Girder Segmental with Tapered Piers	Haunched Girder Segmental with Tapered Piers	Arch with Girder Segmental Approach and Wedge Piers	Cable Stayed with Girder Segmental Approach and Delta Piers
DEMOLISH EXISTING BRIDGE	$9.8	$9.8	$9.8	$9.8
EMBANKMENT	$1.7	$1.5	$1.7	$1.5
ABUTMENT	$2.3	$2.3	$2.3	$2.3
BRIDGE STRUCTURE	$64.2	$67.3	$61.4	$67.5
SYSTEMS (TOLLS, SIGNAGE, ETC.)	$10.0	$10.0	$10.0	$10.0
SUBTOTAL CONSTRUCTION COST	**$88.0**	**$90.9**	**$85.2**	**$91.1**
ENGINEERING: 10%	$8.8	$9.1	$8.5	$9.1
CONSTRUCTION MANAGEMENT: 15%	$13.2	$13.6	$12.8	$13.7
CONTINGENCIES: 30%	$26.4	$27.3	$25.6	$27.3
TOTAL PROJECT COST - 65-feet	**$136.3**	**$141.0**	**$132.1**	**$141.1**
TOTAL PROJECT COST - 45-feet	**$109.1**	**$112.8**	**$105.7**	**$112.9**

NOTES:
1) Cost above do not include any allowance for right-of-way acquisition or environmental mitigation.
2) Estimate based on roadway width of 65 feet (3 lanes at 12', 2-8' shoulders, 1- 10' walkway, and barriers)
3) For a narrower roadway width, 45' (2 lanes at 12', 2-4' shoulders, 1-10' walkway, and barriers) apply 20% cost reduction to values shown above
4) 45' roadway section can be modified in the future by widening 5 feet and re-stripe for 3 lane, see Roadway Width Alternatives
5) Retrofit exsitng alterntive is based on an ultimate roadway width of 50 feet.

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
PROJECT NO.: 13884
DATE: 5/14/2014
ESTIMATOR: R. HARBUCK

EXISTING CORRIDOR
Girder Segmental with Wedge Piers

ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
DEMOLISH EXISTING BRIDGE	271,960	SF	$36	$9,799,000
EMBANKMENT	290	LF	$2,401	$696,389
ABUTMENT	1	EA	$1,148,615	$1,148,615
CONCRETE SEGMENTAL BRIDGE	266,250	SF	$258	$68,755,615
ABUTMENT	1	EA	$1,148,615	$1,148,615
EMBANKMENT	430	LF	$2,401	$1,032,576
SYSTEMS (TOLLS, SIGNAGE, ETC.)	1	LS	$10,000,000	$10,000,000
TOTAL CONSTRUCTION COST				$92,580,809

EXISTING CORRIDOR
Girder Segmental with Delta Piers

ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
DEMOLISH EXISTING BRIDGE	271,960	SF	$36	$9,799,000
EMBANKMENT	290	LF	$2,401	$696,389
ABUTMENT	1	EA	$1,148,615	$1,148,615
CONCRETE SEGMENTAL BRIDGE	273,125	SF	$221	$60,237,794
ABUTMENT	1	EA	$1,148,615	$1,148,615
EMBANKMENT	320	LF	$2,401	$768,429
SYSTEMS (TOLLS, SIGNAGE, ETC.)	1	LS	$10,000,000	$10,000,000
TOTAL CONSTRUCTION COST				$83,798,841

Parsons Brinckerhoff Construction Services

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
PROJECT NO.: 13884
DATE: 5/14/2014
ESTIMATOR: R. HARBUCK

EXISTING CORRIDOR
Retrofit of Existing Bridge

ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
DEMOLISH EXISTING BRIDGE SUBSTRUCTURE	1	LS	$2,615,000	$2,615,000
ABUTMENT	1	EA	$1,148,615	$1,148,615
NEW STEEL TRUSS BRIDGE (REUSE EX. BRIDGE)	297,700	SF	$302	$89,907,184
ABUTMENT	1	EA	$1,148,615	$1,148,615
EMBANKMENT	340	LF	$2,401	$816,456
SYSTEMS (TOLLS, SIGNAGE, ETC.)	1	LS	$10,000,000	$10,000,000
TOTAL CONSTRUCTION COST				$105,635,870

Parsons Brinckerhoff Construction Services

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
PROJECT NO.: 13884
DATE: 5/14/2014
ESTIMATOR: R. HARBUCK

Girder Segmental with Wedge Piers

ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
DEMOLISH EXISTING BRIDGE	271,960	SF	$36	$9,799,000
NO ACCESS INTERCHANGE	1	LS	$20,000,000	$20,000,000
ABUTMENT	1	LS	$1,148,615	$1,148,615
STEEL BOX BRIDGE	200,000	SF	$244	$48,776,937
ABUTMENT	1	LS	$1,148,615	$1,148,615
EMBANKMENT	500	LF	$2,401	$1,200,670
PED/BIKEWAY TO CITY CENTER	5,280	LF	$256	$1,354,242
SYSTEMS (TOLLS, SIGNAGE, ETC.)	1	LS	$10,000,000	$10,000,000
TOTAL CONSTRUCTION COST				$93,428,079

Arch with Girder Segmental Approach and Wedge Piers

ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
DEMOLISH EXISTING BRIDGE	271,960	SF	$36	$9,799,000
NO ACCESS INTERCHANGE	1	LS	$20,000,000	$20,000,000
ABUTMENT	1	LS	$1,148,615	$1,148,615
STEEL ARCH BRIDGE W/ CONC. SEG. APPROACHS	203,000	SF	$294	$59,720,317
ABUTMENT	1	LS	$1,148,615	$1,148,615
EMBANKMENT	500	LF	$2,401	$1,200,670
PED/BIKEWAY TO CITY CENTER	5,280	LF	$256	$1,354,242
SYSTEMS (TOLLS, SIGNAGE, ETC.)	1	LS	$10,000,000	$10,000,000
TOTAL CONSTRUCTION COST				$104,371,459

Parsons Brinckerhoff Construction Services

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
PROJECT NO.: 13884
DATE: 5/14/2014
ESTIMATOR: R. HARBUCK

Girder Segmental with Tapered Piers

ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
DEMOLISH EXISTING BRIDGE	271,960	SF	$36	$9,799,000
EMBANKMENT	700	LF	$2,401	$1,680,938
ABUTMENT	1	EA	$1,148,615	$1,148,615
STEEL BOX BRIDGE	259,063	SF	$248	$64,179,454
ABUTMENT	1	EA	$1,148,615	$1,148,615
SYSTEMS (TOLLS, SIGNAGE, ETC.)	1	LS	$10,000,000	$10,000,000
TOTAL CONSTRUCTION COST				$87,956,622

Haunched Girder Segmental with Tapered Piers

ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
DEMOLISH EXISTING BRIDGE	271,960	SF	$36	$9,799,000
EMBANKMENT	625	LF	$2,401	$1,500,838
ABUTMENT	1	EA	$1,148,615	$1,148,615
CONCRETE SEGMENTAL BRIDGE	266,875	SF	$252	$67,339,592
ABUTMENT	1	EA	$1,148,615	$1,148,615
SYSTEMS (TOLLS, SIGNAGE, ETC.)	1	LS	$10,000,000	$10,000,000
TOTAL CONSTRUCTION COST				$90,936,659

Parsons Brinckerhoff Construction Services

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
PROJECT NO.: 13884
DATE: 5/14/2014
ESTIMATOR: R. HARBUCK

Arch with Girder Segmental Approach and Wedge Piers

ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
DEMOLISH EXISTING BRIDGE	271,960	SF	$36	$9,799,000
EMBANKMENT	700	LF	$2,401	$1,680,938
ABUTMENT	1	EA	$1,148,615	$1,148,615
STEEL ARCH BRIDGE W/ STEEL BOX APPROACHS	256,250	SF	$240	$61,444,416
ABUTMENT	1	EA	$1,148,615	$1,148,615
SYSTEMS (TOLLS, SIGNAGE, ETC.)	1	LS	$10,000,000	$10,000,000
TOTAL CONSTRUCTION COST				$85,221,583

Cable Stayed with Girder Segmental Approach and Delta Piers

ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
DEMOLISH EXISTING BRIDGE	271,960	SF	$36	$9,799,000
EMBANKMENT	625	LF	$2,401	$1,500,838
ABUTMENT	1	EA	$1,148,615	$1,148,615
CABLE STAYED BRIDGE W/ STEEL BOX APPROACHS	262,500	SF	$257	$67,458,530
ABUTMENT	1	EA	$1,148,615	$1,148,615
SYSTEMS (TOLLS, SIGNAGE, ETC.)	1	LS	$10,000,000	$10,000,000
TOTAL CONSTRUCTION COST				$91,055,597

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
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DATE: 5/15/2014
ESTIMATOR: R. HARBUCK

DEMOLISH EXISTING BRIDGE, COMPLETE

ITEM NO.	ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
1	SAFETY AND ENVIROMENTAL	1	LS	$750,000	$750,000
2	DEMOLISH BRIDGE	271,960	SF	$25	$6,799,000
3	BARGEING	1	LS	$1,000,000	$1,000,000
4	LEAD PAINT REMOVAL	1	LS	$1,250,000	$1,250,000
	TOTAL CONSTRUCTION COST	271,960	SF		$9,799,000
	TOTAL UNIT COST	1	SF		$36

DEMOLISH EXISTING BRIDGE, SUBSTRUCTURE ONLY

ITEM NO.	ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
1	SAFETY AND ENVIROMENTAL	1	LS	$500,000	$500,000
2	DEMOLISH BRIDGE SUBSTRUCTURE	21	EA	$65,000	$1,365,000
3	BARGEING	1	LS	$750,000	$750,000
	TOTAL CONSTRUCTION COST	271,960	SF		$2,615,000
	TOTAL UNIT COST	1	SF		$10

Parsons Brinckerhoff Construction Services

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
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DATE: 5/15/2014
ESTIMATOR: R. HARBUCK

EMBANKMENT

ITEM NO.	ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
1	TRAFFIC CONTROL	1,000	LF	$60.00	$60,000
2	CLEARING & GRUBBING	8,444	SY	$1.00	$8,444
3	ROUGH GRADING	76,000	SF	$0.40	$30,096
4	FINISH GRADING	72,000	SF	$0.60	$43,200
5	STRUCTURAL EXCAVATION	800	CY	$16.00	$12,800
6	STRUCTURAL BACKFILL	40,000	CY	$20.00	$800,000
7	MSE RETAINING WALL	32,160	SF	$30.00	$964,800
8	GEOTEXTILE FABRIC	8,000	SY	$1.50	$12,000
9	EROSION CONTROL	1,000	LF	$22.00	$22,000
10	UNDERDRAINS	2,000	LF	$18.00	$36,000
11	ROADWAY DRAINAGE	1,000	LF	$40.00	$40,000
12	ROADWAY PAVING	72,000	SF	$5.00	$360,000
13	ROADWAY SIGNAGE	1,000	LF	$12.00	$12,000
	TOTAL CONSTRUCTION COST	1,000	LF		$2,401,340
	TOTAL UNIT COST	1	LF		$2,401

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
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ESTIMATOR: R. HARBUCK

ABUTMENT

ITEM NO.	ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
1	TRAFFIC CONTROL	50	LF	$60.00	$3,000
2	CLEARING & GRUBBING	400	SY	$1.00	$400
3	EXCAVATION SUPPORT	4,500	SF	$45.00	$202,500
4	ROUGH GRADING	3,800	SF	$0.40	$1,505
5	FINISH GRADING	3,600	SF	$0.60	$2,160
6	STRUCTURAL EXCAVATION	1,350	CY	$16.00	$21,600
7	STRUCTURAL BACKFILL	1,180	CY	$20.00	$23,600
8	INSTALL PILING	9,600	LF	$60.00	$576,000
9	REINFORCING STEEL	97,500	LB	$0.60	$58,500
10	CIPC, FOOTINGS	165	CY	$250.00	$41,250
11	CIPC, WALLS	485	CY	$400.00	$194,000
12	GEOTEXTILE FABRIC	400	SY	$1.50	$600
13	EROSION CONTROL	50	LF	$22.00	$1,100
14	UNDERDRAINS	100	LF	$18.00	$1,800
15	ROADWAY DRAINAGE	50	LF	$40.00	$2,000
16	ROADWAY PAVING	3,600	SF	$5.00	$18,000
17	ROADWAY SIGNAGE	50	LF	$12.00	$600
	TOTAL CONSTRUCTION COST	1	EA		$1,148,615

Parsons Brinckerhoff Construction Services

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
PROJECT NO.: 13884
DATE: 5/15/2014
ESTIMATOR: R. HARBUCK

PED/BIKE WAY ALONG EXISTING ROADWAY

ITEM NO.	ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
1	TRAFFIC CONTROL	5,280	LF	$60.00	$316,800
2	CLEARING & GRUBBING	7,040	SY	$1.00	$7,040
3	ROUGH GRADING	63,360	SF	$0.40	$25,090
4	FINISH GRADING	63,360	SF	$0.60	$38,016
5	STRUCTURAL EXCAVATION	4,224	CY	$16.00	$67,584
6	STRUCTURAL BACKFILL	1,690	CY	$20.00	$33,792
7	BARRIER WALL	5,280	LF	$45.00	$237,600
8	GEOTEXTILE FABRIC	7,040	SY	$1.50	$10,560
9	EROSION CONTROL	5,280	LF	$5.00	$26,400
10	UNDERDRAINS	5,280	LF	$15.00	$79,200
11	DRAINAGE	5,280	LF	$35.00	$184,800
12	PAVING	52,800	SF	$5.00	$264,000
13	SIGNAGE	5,280	LF	$12.00	$63,360
	TOTAL CONSTRUCTION COST	5,280	LF		$1,354,242
	TOTAL UNIT COST	1	LF		$256

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
PROJECT NO.: 13884
DATE: 5/14/2002
ESTIMATOR: R. HARBUCK

EC CONCRETE SEGMENTAL BRIDGE WITH WEDGE PIERS
(Typical Span of 300')

ITEM NO.	ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
1	SITE PREPARATION	1	LS	$500,000	$500,000
2	DRILLED SHAFT/ CONCRETE PILES	15,400	VF	$2,089.00	$32,170,600
3	PILE CAP CONCRETE	2,257	CY	$482.00	$1,087,874
4	PIER CONCRETE	11,507	CY	$733.00	$8,434,387
5	SEGMENTAL BOX CONCRETE	17,466	CY	$998.00	$17,431,068
6	LATEX MODIFIED CONCRETE OVERLAY, 1.5"	29,583	SY	$39.00	$1,153,750
7	POST-TENSIONING	913	TN	$6,266.00	$5,722,346
8	POT BEARINGS	28	EA	$24,400.00	$683,200
9	WOODEN FENDER	14	SET	$13,725.00	$192,150
10	AESTHETIC & WALKWAY LIGHTING	4,260	LF	$146.00	$621,960
11	NAVIGATIONAL LIGHTING	4,260	LF	$31.00	$132,060
12	BRIDGE FENCE AND BARRIERS	12,780	LF	$49.00	$626,220
	TOTAL CONSTRUCTION COST	266,250	SF		$68,755,615
	TOTAL UNIT COST	1	SF		$258

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
PROJECT NO.: 13884
DATE: 5/14/2002
ESTIMATOR: R. HARBUCK

EC CONCRETE SEGMENTAL BRIDGE WITH DELTA PIERS
(Typical Span of 300')

ITEM NO.	ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
1	SITE PREPARATION	1	LS	$500,000	$500,000
2	DRILLED SHAFT/ CONCRETE PILES	11,400	VF	$2,089.00	$23,814,600
3	PILE CAP CONCRETE	1,934	CY	$482.00	$932,188
4	PIER CONCRETE	10,764	CY	$733.00	$7,890,012
5	SEGMENTAL BOX CONCRETE	17,917	CY	$998.00	$17,881,166
6	LATEX MODIFIED CONCRETE OVERLAY, 1.5"	30,347	SY	$39.00	$1,183,542
7	POST-TENSIONING	937	TN	$6,266.00	$5,870,106
8	POT BEARINGS	24	EA	$24,400.00	$585,600
9	WOODEN FENDER	12	SET	$13,725.00	$164,700
10	AESTHETIC & WALKWAY LIGHTING	4,370	LF	$146.00	$638,020
11	NAVIGATIONAL LIGHTING	4,370	LF	$31.00	$135,470
12	BRIDGE FENCE AND BARRIERS	13,110	LF	$49.00	$642,390
	TOTAL CONSTRUCTION COST	266,250	SF		$60,237,794
	TOTAL UNIT COST	1	SF		$221

Parsons Brinckerhoff Construction Services

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
PROJECT NO.: 13884
DATE: 5/14/2002
ESTIMATOR: R. HARBUCK

EA STEEL ARCH WITH CONCRETE SEGMENTAL APPROACHES AND WEDGE PIERS (Typical Span of 300')

ITEM NO.	ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
1	SITE PREPARATION	1	LS	$500,000	$500,000
2	DRILLED SHAFT/ CONCRETE PILES	12,100	VF	$2,089.00	$25,276,900
3	PILE CAP CONCRETE	1,773	CY	$482.00	$854,586
4	PIER CONCRETE	11,618	CY	$733.00	$8,515,994
5	SEGMENTAL BOX CONCRETE	10,660	CY	$998.00	$10,638,680
6	DECK CONCRETE	1125	CY	$814.00	$915,750
7	STRUCTURAL STEEL, ARCH	1,904	TN	$3,701.00	$7,046,704
8	LATEX MODIFIED CONCRETE OVERLAY, 1.5"	22,556	SY	$39.00	$879,667
9	POST-TENSIONING	557	TN	$6,266.00	$3,492,512
10	POT BEARINGS	18	EA	$24,400.00	$439,200
11	WOODEN FENDER	9	SET	$13,725.00	$123,525
12	AESTHETIC & WALKWAY LIGHTING	3,200	LF	$146.00	$467,200
13	NAVIGATIONAL LIGHTING	3,200	LF	$31.00	$99,200
14	BRIDGE FENCE AND BARRIERS	9,600	LF	$49.00	$470,400
	TOTAL CONSTRUCTION COST	203,000	SF		$59,720,317
	TOTAL UNIT COST	1	SF		$294

Parsons Brinckerhoff Construction Services

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
PROJECT NO.: 13884
DATE: 5/15/2014
ESTIMATOR: R. HARBUCK

CC HAUNCHED CONCRETE SEGMENTAL BRIDGE WITH TAPERED PIERS
(Typical Span of 450')

ITEM NO.	ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
1	SITE PREPARATION	1	LS	$500,000	$500,000
2	DRILLED SHAFT/ CONCRETE PILES	13,050	VF	$2,089.00	$27,261,450
3	PILE CAP CONCRETE	2,176	CY	$482.00	$1,048,832
4	PIER CONCRETE	11,244	CY	$733.00	$8,241,852
5	SEGMENTAL BOX CONCRETE	21,492	CY	$998.00	$21,449,016
6	LATEX MODIFIED CONCRETE OVERLAY, 1.5"	29,653	SY	$39.00	$1,156,458
7	POST-TENSIONING	915	TN	$6,266.00	$5,735,779
8	POT BEARINGS	18	EA	$24,400.00	$439,200
9	WOODEN FENDER	9	SET	$13,725.00	$123,525
10	AESTHETIC LIGHTING	4,270	LF	$146.00	$623,420
11	NAVIGATIONAL LIGHTING	4,270	LF	$31.00	$132,370
12	BRIDGE FENCE AND BARRIERS	12,810	LF	$49.00	$627,690
	TOTAL CONSTRUCTION COST	266,875	SF		$67,339,592
	TOTAL UNIT COST	1	SF		$252

Parsons Brinckerhoff Construction Services

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
PROJECT NO.: 13884
DATE: 5/15/2014
ESTIMATOR: R. HARBUCK

EC RETROFIT OF EXISTING BRIDGE WITH NEW STEEL TRUSS
(Typical Span of 300')

ITEM NO.	ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
1	SITE PREPARATION	1	LS	$500,000	$500,000
2	DRILLED SHAFT/ CONCRETE PILES	15,600	VF	$2,089.00	$32,588,400
3	PILE CAP CONCRETE	1,934	CY	$482.00	$932,188
4	PIER CONCRETE	4,930	CY	$733.00	$3,613,690
5	DECK CONCRETE	8,269	CY	$814.00	$6,730,966
6	STRUCTURAL STEEL, NEW SPANS	9,931	TN	$3,050.00	$36,754,631
7	RELOCATE EXISTING BRIDGE TO NEW PIERS	4,061	TN	$1,296.00	$5,263,056
8	LATEX MODIFIED CONCRETE OVERLAY, 1.5"	33,078	SY	$39.00	$1,290,033
9	BEARINGS	24	EA	$24,400.00	$585,600
10	WOODEN FENDER	12	SET	$13,725.00	$164,700
11	AESTHETIC & WALKWAY LIGHTING	4,580	LF	$146.00	$668,680
12	NAVIGATIONAL LIGHTING	4,580	LF	$31.00	$141,980
13	BRIDGE FENCE AND BARRIERS	13,740	LF	$49.00	$673,260
	TOTAL CONSTRUCTION COST	297,700	SF		$89,907,184
	TOTAL UNIT COST	1	SF		$302

Parsons Brinckerhoff Construction Services

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
PROJECT NO.: 13884
DATE: 5/15/2014
ESTIMATOR: R. HARBUCK

EA STEEL SEGMENTAL BRIDGE WITH WEDGE PIERS
(Typical Span of 500')

ITEM NO.	ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
1	SITE PREPARATION	1	LS	$500,000	$500,000
2	DRILLED SHAFT/ CONCRETE PILES	9,000	VF	$2,089.00	$18,801,000
3	PILE CAP CONCRETE	1,330	CY	$482.00	$641,060
4	PIER CONCRETE	7,640	CY	$733.00	$5,600,120
5	DECK CONCRETE	7,010	CY	$814.00	$5,706,140
6	STRUCTURAL STEEL, BOX GIRDER	5,000	TN	$3,050.00	$15,250,000
7	LATEX MODIFIED CONCRETE OVERLAY, 1.5"	22,222	SY	$39.00	$866,667
8	BEARINGS	12	EA	$24,400.00	$292,800
9	WOODEN FENDER	6	SET	$13,725.00	$82,350
10	AESTHETIC & WALKWAY LIGHTING	3,200	LF	$146.00	$467,200
11	NAVIGATIONAL LIGHTING	3,200	LF	$31.00	$99,200
12	BRIDGE FENCE AND BARRIERS	9,600	LF	$49.00	$470,400
	TOTAL CONSTRUCTION COST	200,000	SF		$48,776,937
	TOTAL UNIT COST	1	SF		$244

Parsons Brinckerhoff Construction Services

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
PROJECT NO.: 13884
DATE: 5/15/2014
ESTIMATOR: R. HARBUCK

CC STEEL SEGMENTAL BRIDGE WITH TAPERED PIERS
(Typical Span of 500')

ITEM NO.	ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
1	SITE PREPARATION	1	LS	$500,000	$500,000
2	DRILLED SHAFT/ CONCRETE PILES	11,600	VF	$2,089.00	$24,232,400
3	PILE CAP CONCRETE	1,934	CY	$482.00	$932,188
4	PIER CONCRETE	11,464	CY	$733.00	$8,403,112
5	DECK CONCRETE	9,080	CY	$814.00	$7,391,120
6	STRUCTURAL STEEL, BOX GIRDER	6,477	TN	$3,050.00	$19,754,850
7	LATEX MODIFIED CONCRETE OVERLAY, 1.5"	28,785	SY	$39.00	$1,122,604
8	BEARINGS	16	EA	$24,400.00	$390,400
9	WOODEN FENDER	8	SET	$13,725.00	$109,800
10	AESTHETIC & WALKWAY LIGHTING	4,145	LF	$146.00	$605,170
11	NAVIGATIONAL LIGHTING	4,145	LF	$31.00	$128,495
12	BRIDGE FENCE AND BARRIERS	12,435	LF	$49.00	$609,315
	TOTAL CONSTRUCTION COST	259,063	SF		$64,179,454
	TOTAL UNIT COST	1	SF		$248

Parsons Brinckerhoff Construction Services

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
PROJECT NO.: 13884
DATE: 5/15/2014
ESTIMATOR: R. HARBUCK

CC STEEL ARCH WITH STEEL SEGMENTAL APPROACHES AND WEDGE PIERS
(Typical Span of 500')

ITEM NO.	ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
1	SITE PREPARATION	1	LS	$500,000	$500,000
2	DRILLED SHAFT/ CONCRETE PILES	9,900	VF	$2,089.00	$20,681,100
3	PILE CAP CONCRETE	1,451	CY	$482.00	$699,382
4	PIER CONCRETE	7,590	CY	$733.00	$5,563,470
5	DECK CONCRETE	9,087	CY	$814.00	$7,396,818
6	STRUCTURAL STEEL, BOX GIRDER	5,469	TN	$3,050.00	$16,680,450
7	LATEX MODIFIED CONCRETE OVERLAY, 1.5"	28,472	SY	$39.00	$7,046,704
8	BEARINGS	14	EA	$24,400.00	$1,110,417
9	WOODEN FENDER	7	SET	$13,725.00	$96,075
10	AESTHETIC & WALKWAY LIGHTING	4,100	LF	$146.00	$598,600
11	NAVIGATIONAL LIGHTING	4,100	LF	$31.00	$127,100
12	BRIDGE FENCE AND BARRIERS	12,300	LF	$49.00	$602,700
	TOTAL CONSTRUCTION COST	256,250	SF		$61,444,416
	TOTAL UNIT COST	1	SF		$240

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
PROJECT NO.: 13884
DATE: 5/15/2014
ESTIMATOR: R. HARBUCK

CC CABLE STAYED WITH STEEL SEGMENTAL APPROACH AND DELTA PIERS (Typical Span of 500')

ITEM NO.	ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
1	SITE PREPARATION	1	LS	$500,000	$500,000
2	DRILLED SHAFT/ CONCRETE PILES	4,750	VF	$2,089.00	$9,922,750
3	PILE CAP CONCRETE	806	CY	$482.00	$388,492
4	PIER CONCRETE	3,911	CY	$733.00	$2,866,763
5	PYLON CONCRETE	16,470	CY	$915.00	$15,070,050
6	DECK CONCRETE	9,200	CY	$814.00	$7,488,800
7	STRUCTURAL STEEL, BOX GIRDER	6,563	TN	$3,050.00	$20,017,150
8	ERECT AND TENSION CABLE STAYS	860	TN	$9,760.00	$8,393,600
9	LATEX MODIFIED CONCRETE OVERLAY, 1.5"	29,167	SY	$39.00	$1,137,500
10	BEARINGS	10	EA	$24,400.00	$244,000
11	WOODEN FENDER	5	SET	$13,725.00	$68,625
12	AESTHETIC & WALKWAY LIGHTING	4,200	LF	$146.00	$613,200
13	NAVIGATIONAL LIGHTING	4,200	LF	$31.00	$130,200
14	BRIDGE FENCE AND BARRIERS	12,600	LF	$49.00	$617,400
	TOTAL CONSTRUCTION COST	262,500	SF		$67,458,530
	TOTAL UNIT COST	1	SF		$257

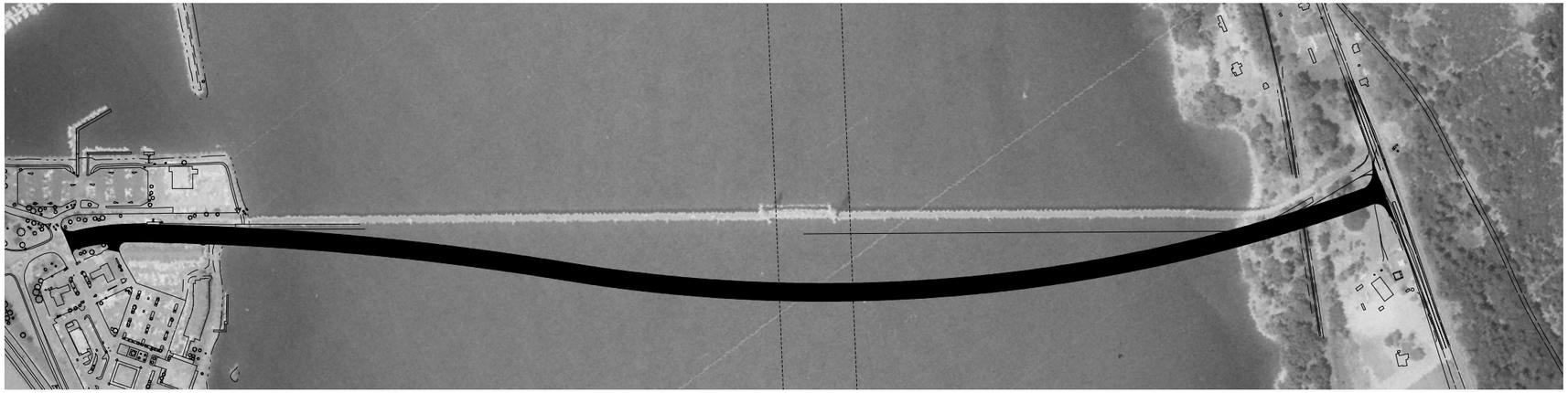
Parsons Brinckerhoff Construction Services

PROJECT NAME: SR 35 - COLUMBIA RIVER CROSSING
PROJECT NO.: 13884
DATE: 5/15/2014
ESTIMATOR: R. HARBUCK

CC STEEL SEGMENTAL BRIDGE WITH TAPERED PIERS
(Typical Span of 500')

ITEM NO.	ITEM DESCRIPTION	EST. QTY.	UNIT	UNIT COST	TOTAL COST
1	SITE PREPARATION	1	LS	$500,000	$500,000
2	DRILLED SHAFT/ CONCRETE PILES	8,400	VF	$2,089.00	$17,547,600
3	PILE CAP CONCRETE	1,365	CY	$482.00	$657,930
4	PIER CONCRETE	8,407	CY	$733.00	$6,162,331
5	DECK CONCRETE	6,102	CY	$814.00	$4,967,028
6	STRUCTURAL STEEL, BOX GIRDER	4,352	TN	$3,050.00	$13,273,600
7	LATEX MODIFIED CONCRETE OVERLAY, 1.5"	19,343	SY	$39.00	$754,390
8	BEARINGS	16	EA	$24,400.00	$390,400
9	WOODEN FENDER	8	SET	$13,725.00	$109,800
10	AESTHETIC & WALKWAY LIGHTING	4,145	LF	$146.00	$605,170
11	NAVIGATIONAL LIGHTING	4,145	LF	$31.00	$128,495
12	BRIDGE FENCE AND BARRIERS	12,435	LF	$49.00	$609,315
	TOTAL CONSTRUCTION COST	174,090	SF		$45,706,059
	TOTAL UNIT COST	1	SF		$263

Conceptual Bridge Types



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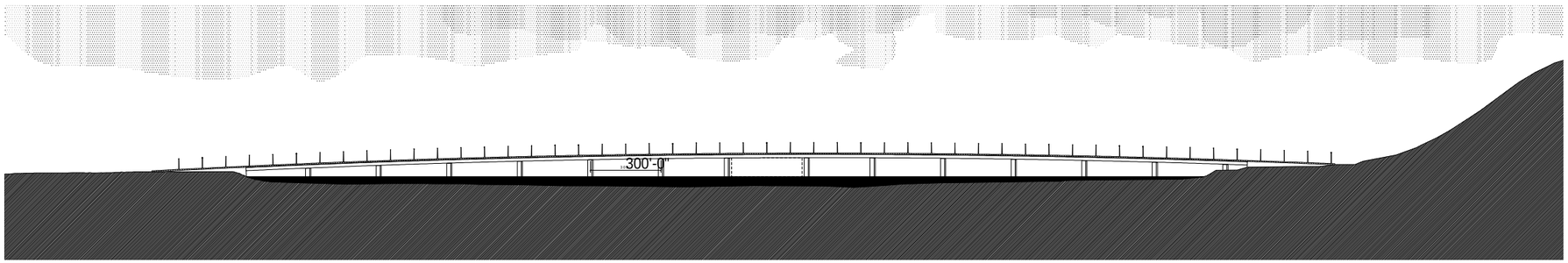

ELEVATION - 1" = 100'-0"
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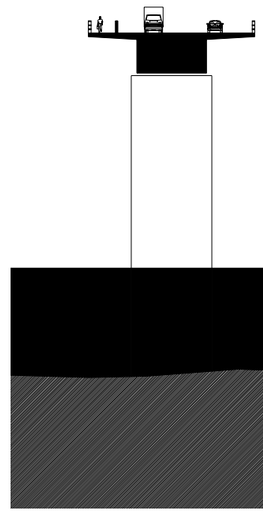

SECTION THROUGH GIRDER 1" = 10'-0"
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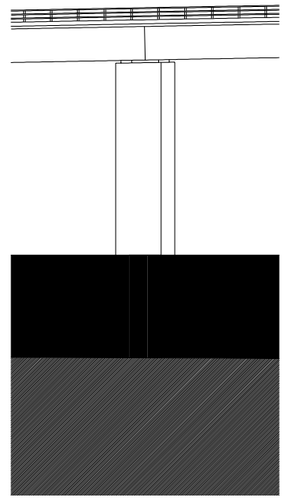

PARTIAL ELEVATION @ PIER 1" = 10'-0"
0 5' 10' 20'

PARTIAL PLAN @ PIER 1" = 10'-0"
0 5' 10' 20'

EXISTING CORRIDOR - GIRDER SEGMENTAL WITH WEDGE PIERS

SR-35/COLUMBIA RIVER CROSSING STUDY
WSDOT - RTC - ODOT

FEBRUARY 28, 2002
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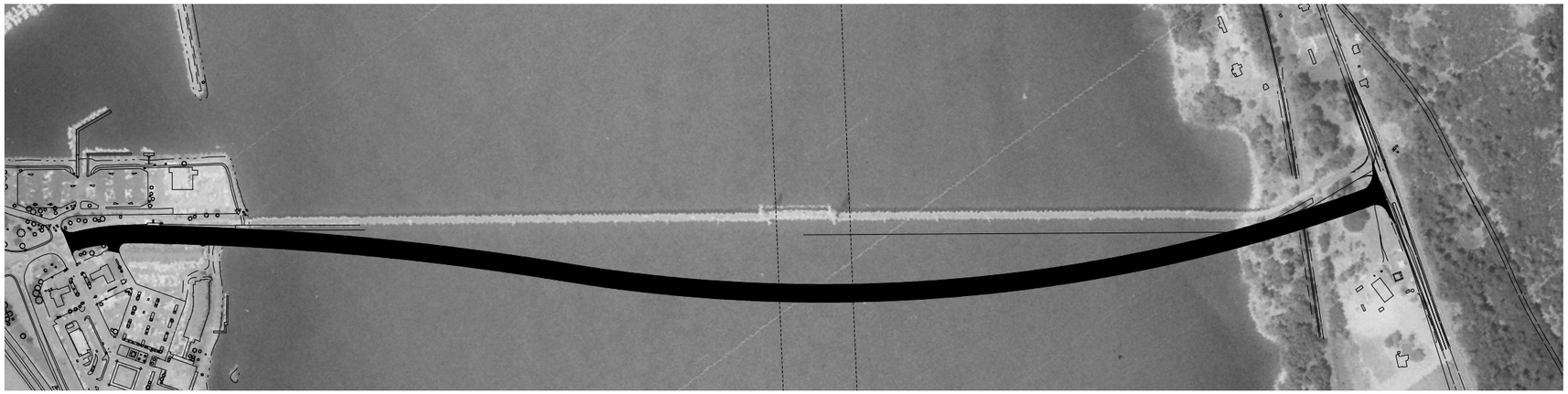
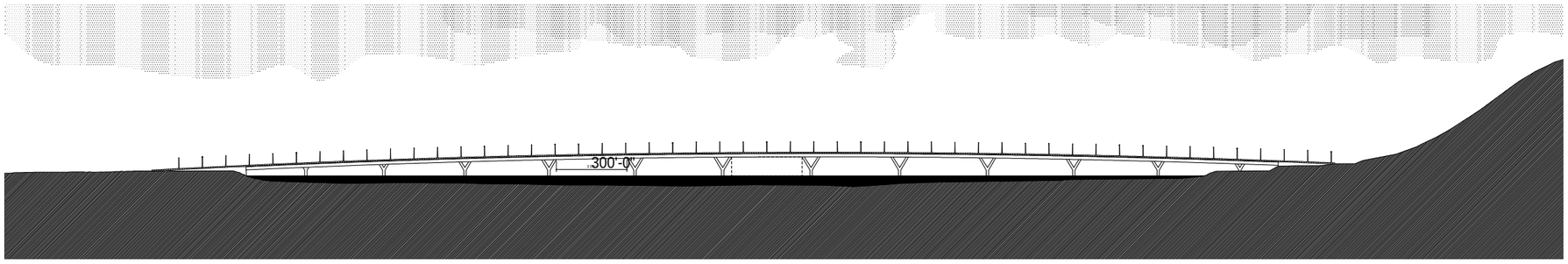
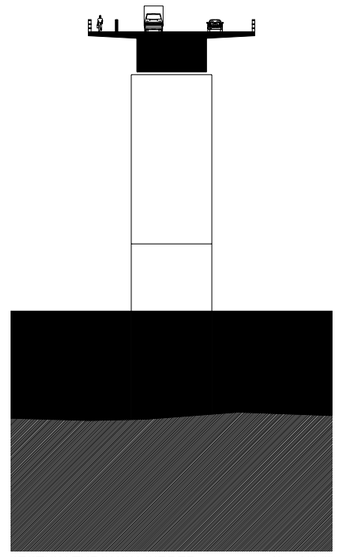


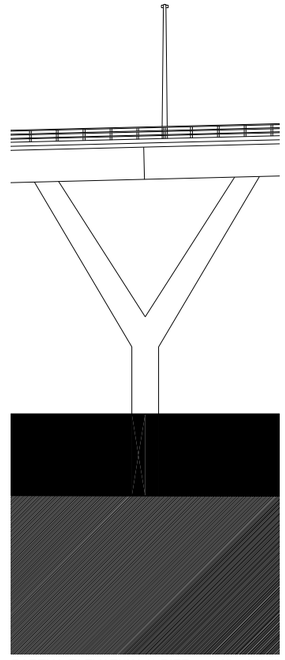
PLAN VIEW - 1" = 100'-0"
0 50' 100' 200'



ELEVATION - 1" = 100'-0"
0 50' 100' 200'



SECTION THROUGH GIRDER 1" = 10'-0"
0 5' 10' 20'



PARTIAL ELEVATION @ PIER 1" = 10'-0"
0 5' 10' 20'

EXISTING CORRIDOR - GIRDER SEGMENTAL WITH DELTA PIERS

SR-35/COLUMBIA RIVER CROSSING STUDY
WSDOT - RTC - ODOT

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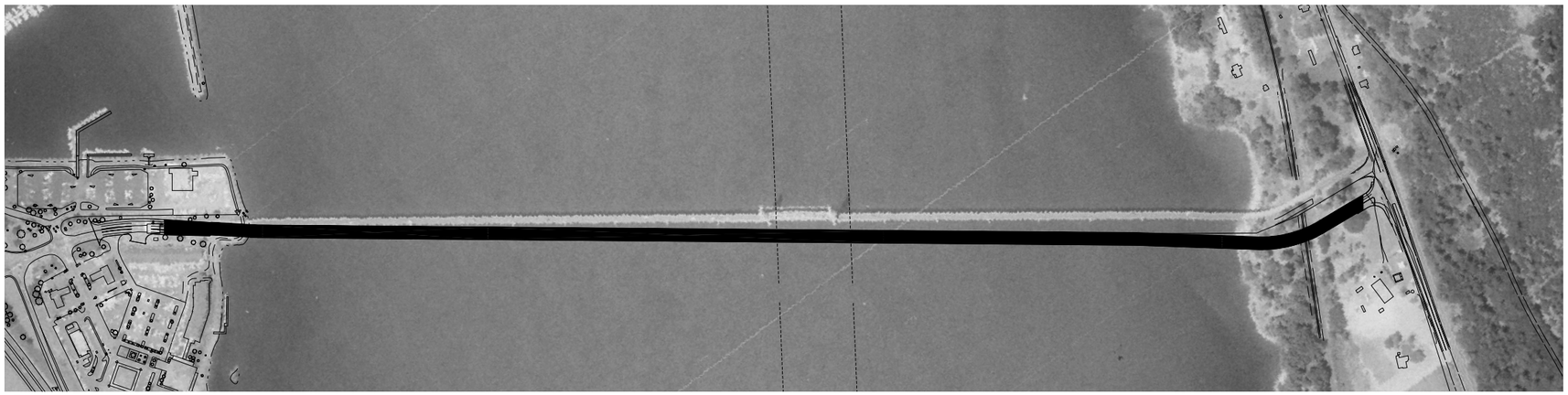
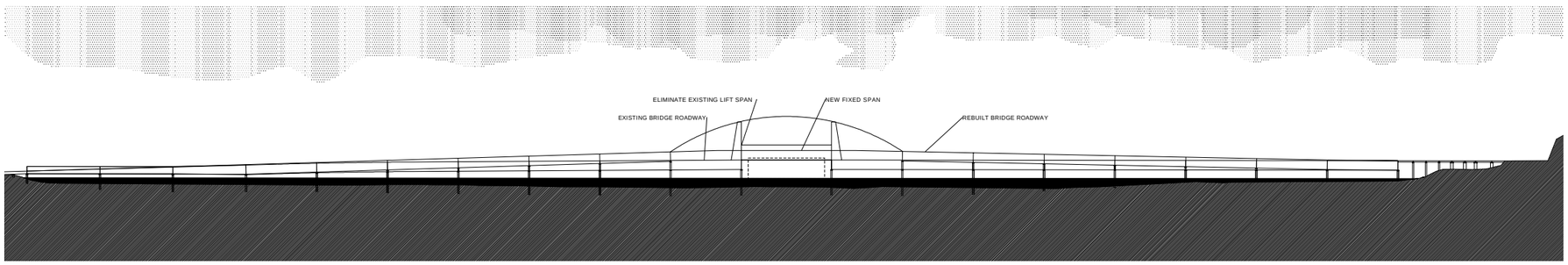


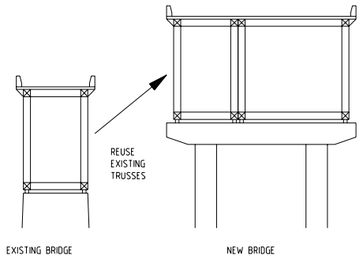
PLAN VIEW - 1" = 100'-0"

0 50' 100' 200'



ELEVATION - 1" = 100'-0"

0 50' 100' 200'



SECTION THROUGH GIRDER 1" = 10'-0"

0 5' 10' 20'

EXISTING CORRIDOR - RETROFIT OF EXISTING BRIDGE

SR-35/COLUMBIA RIVER CROSSING STUDY
WSDOT - RTC - ODOT

FEBRUARY 28, 2002
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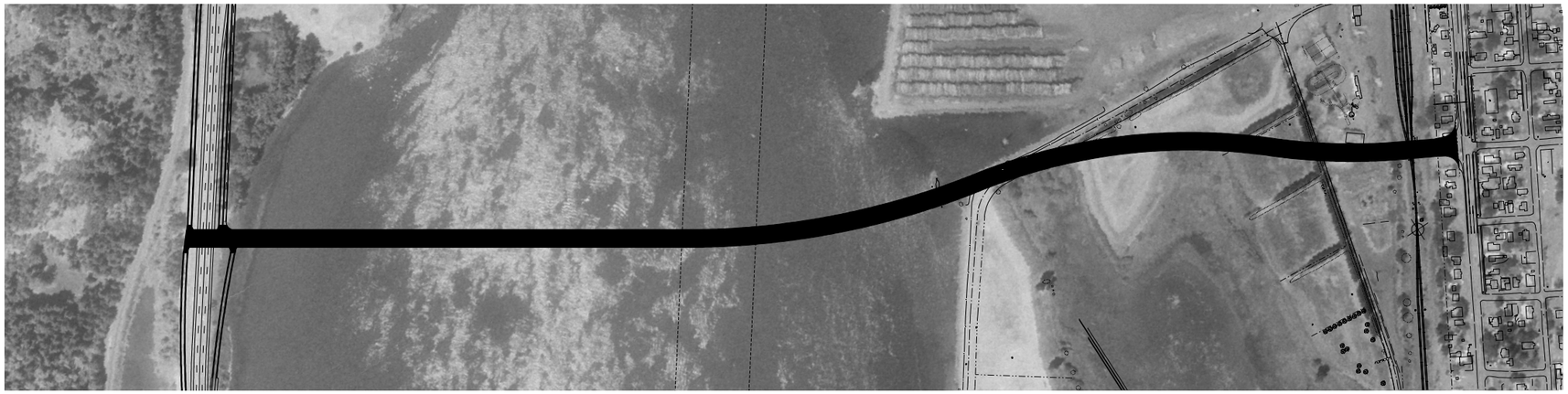
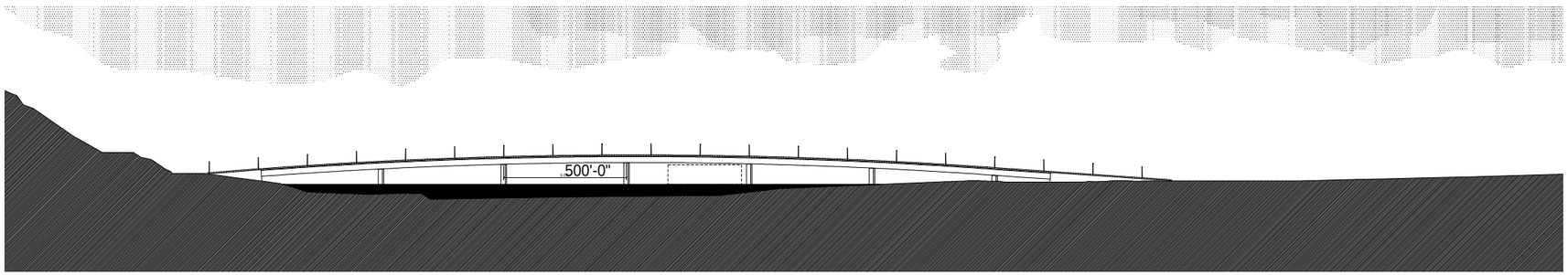
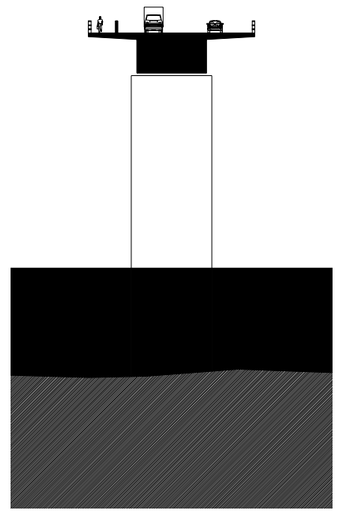


PLAN VIEW - 1" = 100'-0"
0 50' 100' 200'

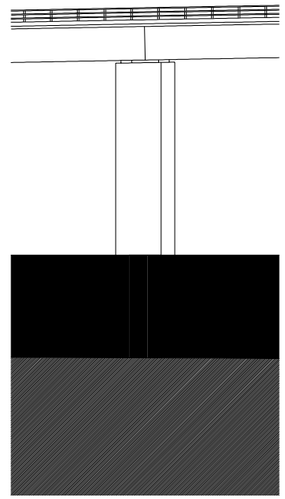


ELEVATION - 1" = 100'-0"
0 50' 100' 200'

PARTIAL PLAN @ PIER 1" = 10'-0"
0 5' 10' 20'



SECTION THROUGH GIRDER 1" = 10'-0"
0 5' 10' 20'

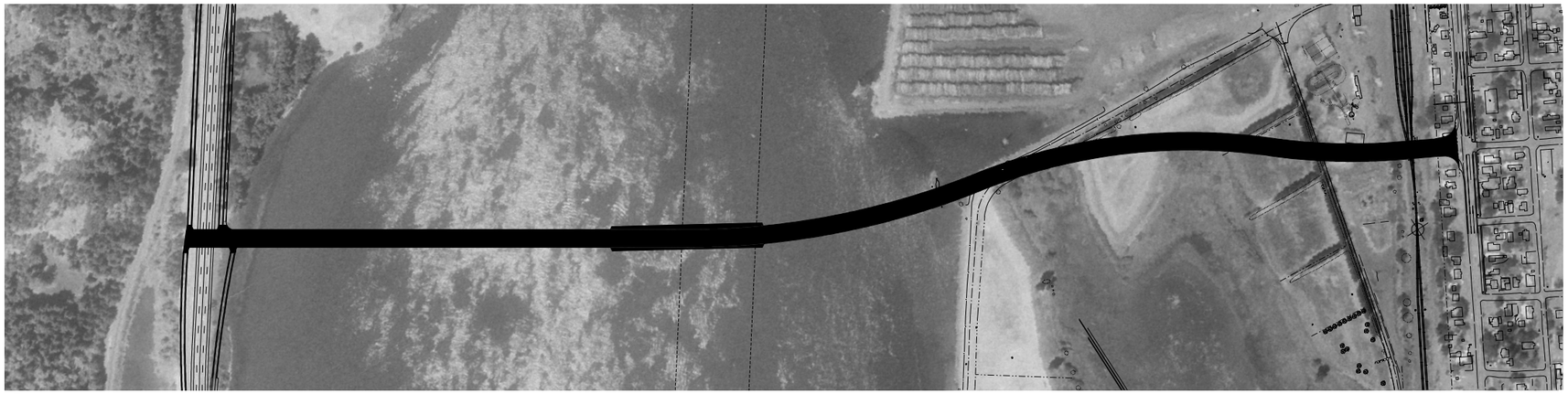


PARTIAL ELEVATION @ PIER 1" = 10'-0"
0 5' 10' 20'

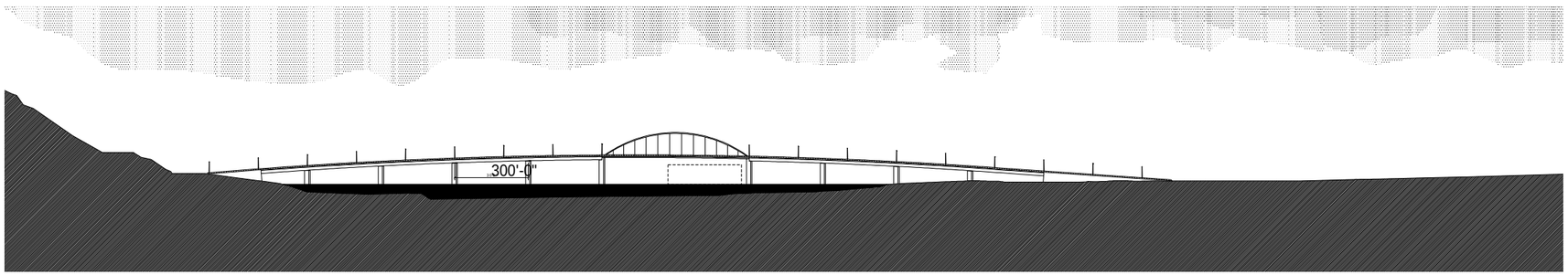
EAST A CORRIDOR - GIRDER SEGMENTAL WITH WEDGE PIERS

SR-35/COLUMBIA RIVER CROSSING STUDY
WSDOT - RTC - ODOT

FEBRUARY 28, 2002
PB - ZGF - COC



PLAN VIEW - 1" = 100'-0"
0 50' 100' 200'



ELEVATION - 1" = 100'-0"
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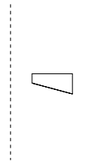

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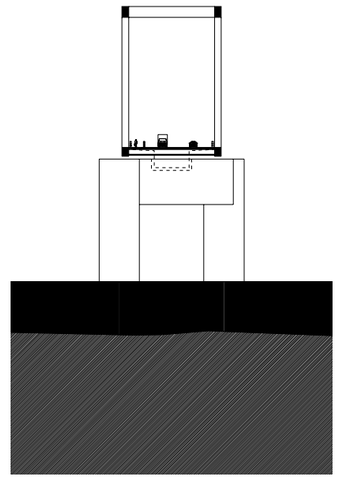


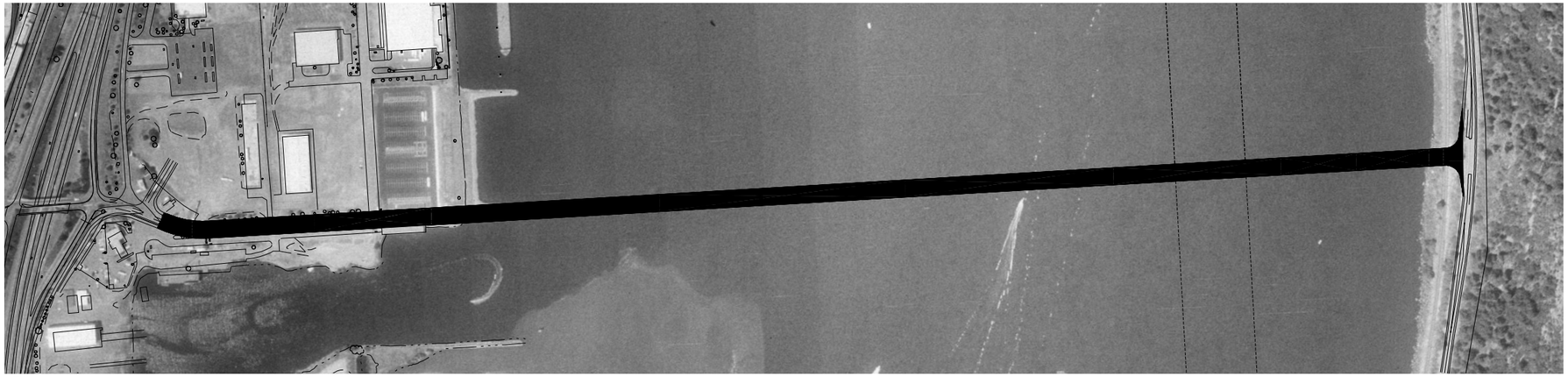
SECTION THROUGH TIED ARCH 1" = 20'-0"
0 10' 20' 40'

SECTION THROUGH GIRDER 1" = 20'-0"
0 10' 20' 40'

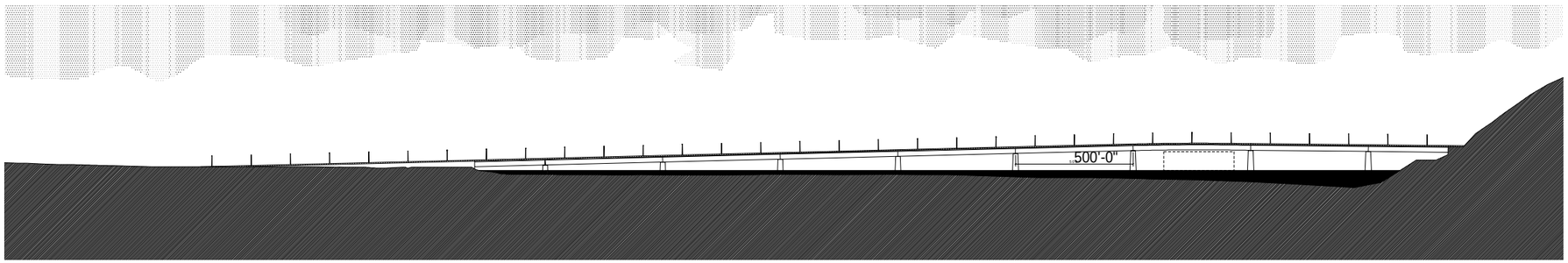
EAST A CORRIDOR - ARCH WITH GIRDER SEGMENTAL AND WEDGE PIERS

SR-35/COLUMBIA RIVER CROSSING STUDY
WSDOT - RTC - ODOT

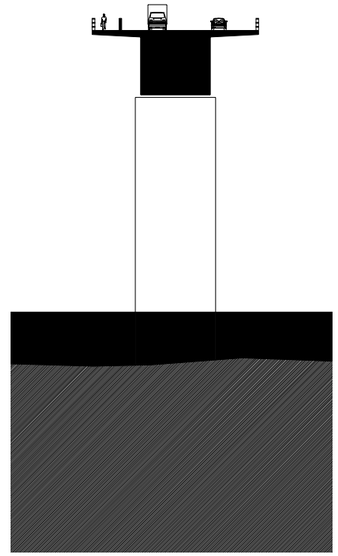
FEBRUARY 28, 2002
PB - ZGF - COC



PLAN VIEW - 1" = 100'-0"
0 50' 100' 200'



ELEVATION - 1" = 100'-0"
0 50' 100' 200'



SECTION THROUGH GIRDER 1" = 10'-0"
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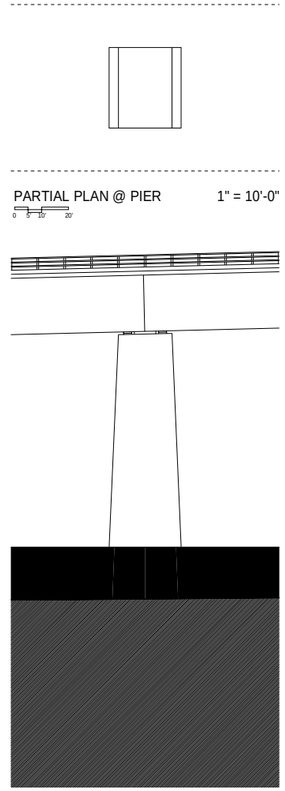


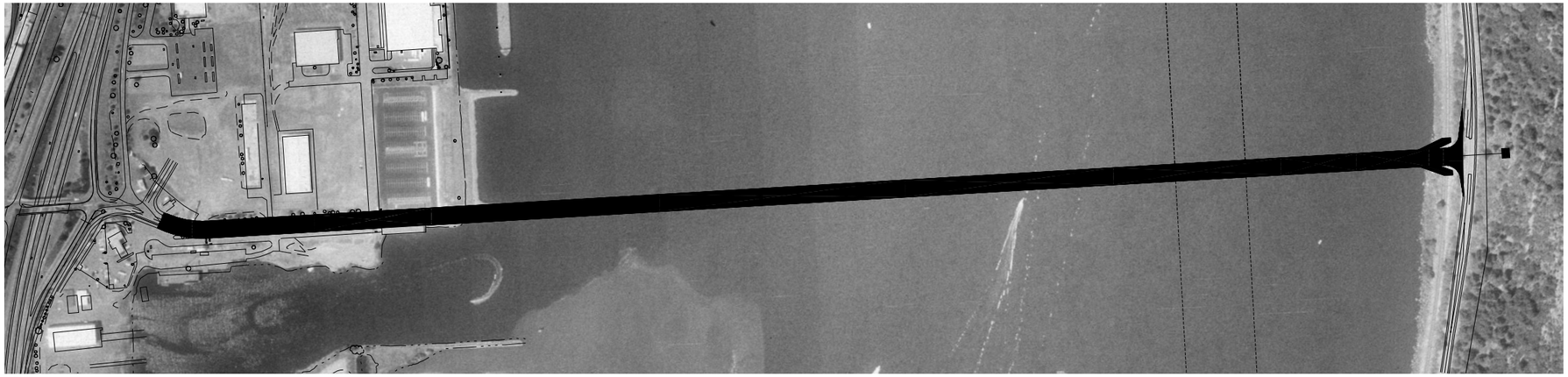
PARTIAL PLAN @ PIER 1" = 10'-0"
0 5' 10' 20'

PARTIAL ELEVATION @ PIER 1" = 10'-0"
0 5' 10' 20'

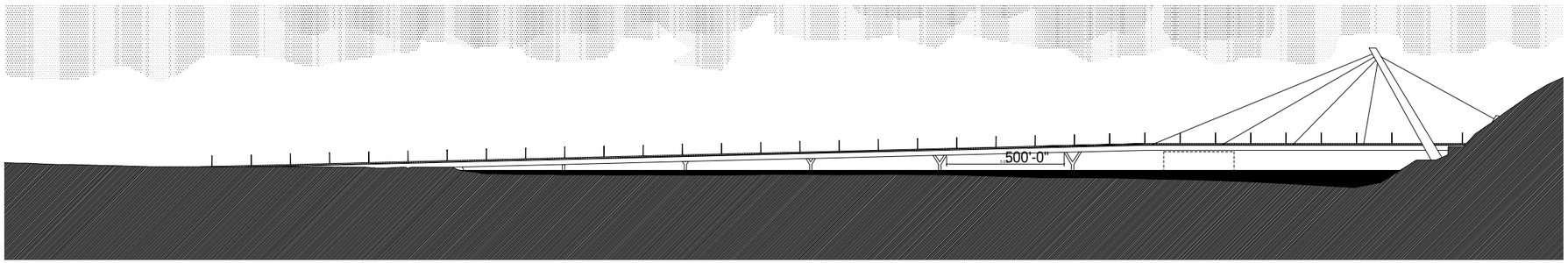
CITY CENTER CORRIDOR - GIRDER SEGMENTAL WITH TAPERED PIERS

SR-35/COLUMBIA RIVER CROSSING STUDY
WSDOT - RTC - ODOT

FEBRUARY 28, 2002
PB - ZGF - COC



PLAN VIEW - 1" = 100'-0"
0 50' 100' 200'



ELEVATION - 1" = 100'-0"
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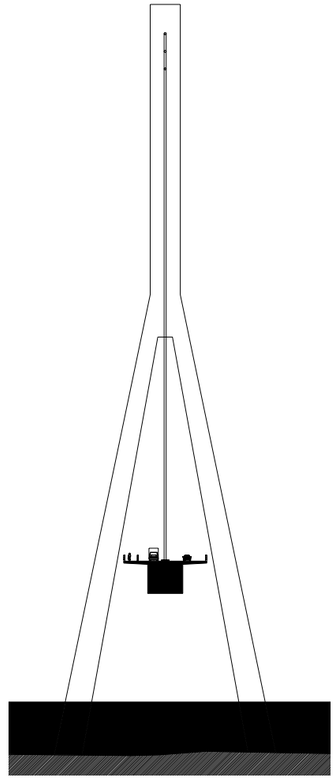

SECTION THROUGH CABLE STAYED SPAN 1" = 20'-0"
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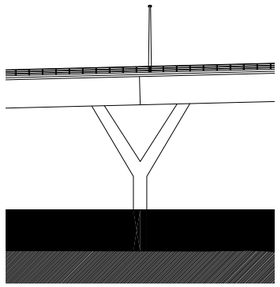

PARTIAL ELEV. @ PIER 1" = 20'-0"
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CITY CENTER CORRIDOR - CABLE STAYED WITH GIRDER SEGMENTAL APPROACH AND DELTA PIERS

SR-35/COLUMBIA RIVER CROSSING STUDY
WSDOT - RTC - ODOT

FEBRUARY 28, 2002
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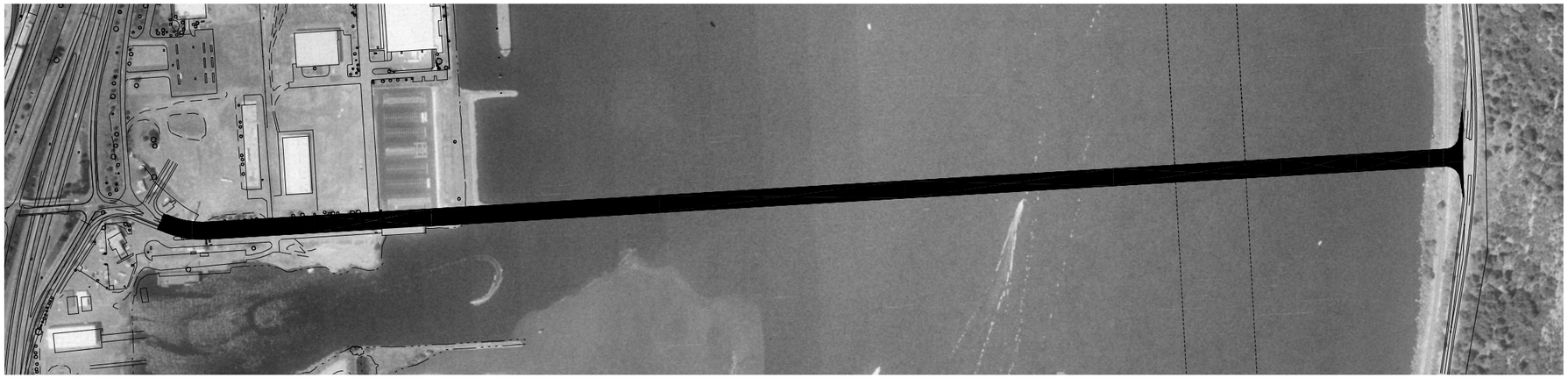
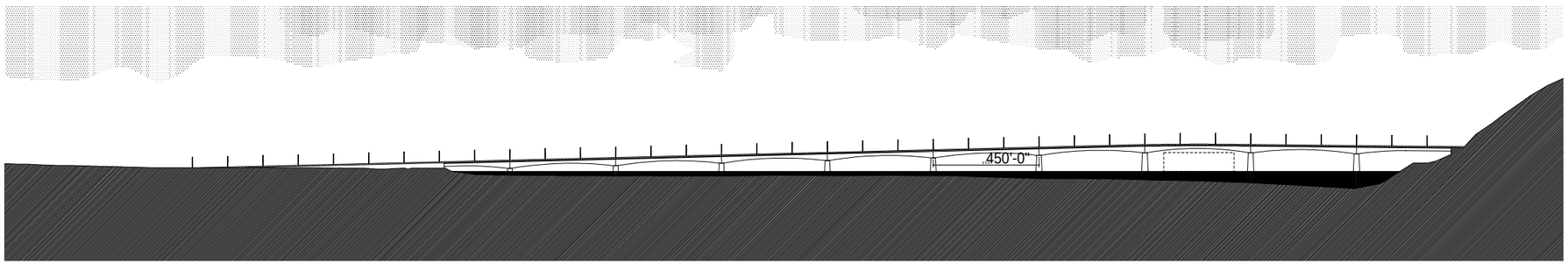


PLAN VIEW - 1" = 100'-0"
0 50' 100' 200'



ELEVATION - 1" = 100'-0"
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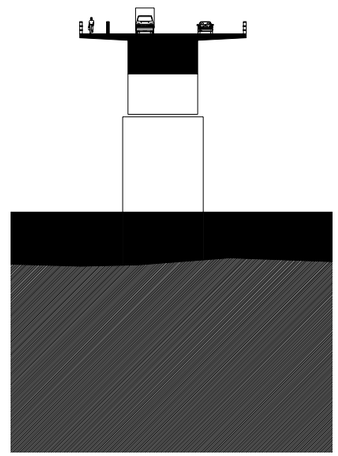

SECTION THROUGH HAUNCHED GIRDER 1" = 10'-0"
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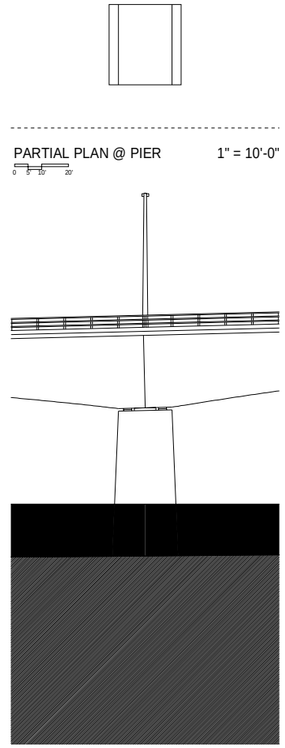

PARTIAL ELEVATION @ PIER 1" = 10'-0"
0 5' 10' 20'

PARTIAL PLAN @ PIER 1" = 10'-0"
0 5' 10' 20'

CITY CENTER CORRIDOR - HAUNCHED GIRDER SEGMENTAL WITH TAPERED PIERS

SR-35/COLUMBIA RIVER CROSSING STUDY
WSDOT - RTC - ODOT

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Appendix C – Financial Feasibility

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Toll Revenue Potential

Introduction

The State Route 35 Columbia River Crossing Feasibility Study began in late 2000 as a multi-tier effort to consider replacement alternatives to an aging movable span bridge. Completed in 1924, the existing "Hood River" bridge has a narrow two lane deck and no pedestrian facilities. It is owned by the Port of Hood River and operated as a toll bridge with a 75¢ toll each way. The bridge connects the south central Washington State communities of Bingen and White Salmon with Hood River on the Oregon side of the Columbia River.

As part of Tier II of the study, public opinion surveys were conducted in October 2001. This consisted of a randomly sampled telephone survey of 400 local residents and an intercept survey of bridge users on a Sunday and Monday. Key objectives of both surveys were to gather information about bridge user travel patterns, gauge interest in a new crossing, and identify their willingness to pay higher tolls — the latter being a key source of financing for a new facility.

The study team employed the survey results regarding willingness to pay tolls along with traffic demand projections to assess the potential range of annual revenue that could be available to help finance a new crossing. A simple financial model was prepared to consider project funding sources and uses of funds. Results from the model can then be used to consider the financial feasibility of various funding scenarios.

Traffic Projections

Building on previous Tier I work, more detailed traffic projections were produced in Tier II to support the financial feasibility analysis. This involved the development of an econometric regression model to "explain" traffic as a function of various economic and demographic variables, which can then be used to forecast future traffic trends based upon projections for these variables. At the same time, a time-series model was fit to historic traffic data to project future seasonality. Results from the two models were then combined to provide both the underlying growth trend and the seasonal variation in future traffic. For purposes of financing a new bridge crossing, it is necessary to project traffic and revenue for at least the first few years of operation. A 20 year time horizon was identified for the traffic forecasts, to allow for normal EIS, design and build procedures, and potential schedule delays.

Several available data sources were tested for their explanatory power as independent variables for the econometric traffic model. Explanatory variables

were limited to those that had available quarterly projections for the forecast horizon year or to those that could be readily estimated from the projection of a similar, highly correlated data series. Also, statistical validity of the results prevented the use of two or more variables that were highly correlated (very similar) to each other. Finally, since the potential independent variables were either seasonally adjusted or did not exhibit seasonality, it was necessary to seasonally smooth quarterly traffic, the dependent variable.[1] The following model was estimated to predict future bridge traffic, using quarterly data dating back to 1990:

$$QTRAFSA_t = -344{,}991 + (0.440 \times QTRAFSA_{t-1}) + (59.25 \times HREMP_t) - (26.07 \times HREMP_{t-1}) + \left(2{,}476{,}592 \times \frac{KLEMP_t}{KLPOP_t}\right) - \left(1{,}089{,}700 \times \frac{KLEMP_{t-1}}{KLPOP_{t-1}}\right)$$

where $QTRAFSA_t$ = Quarterly seasonally adjusted traffic volume at time t
$HREMP_t$ = Hood River County Employment at time t
$KLEMP_t$ = Klickitat County Employment at time t
$KLPOP_t$ = Klickitat County Population at time t

The intercept survey data indicated that more than 75% of monthly bridge traffic is generated by Washington residents, and that 44% of monthly traffic is for commute or business purposes. Hood River County employment proved to have good positively correlated explanatory power for this result — both in terms of the county being an economic center attracting Washington residents as employees, and as an indicator of Washington residents' demand for Oregon retail goods and services, which is driven by Oregon's lack of sales tax.[2] The Klickitat County Employment Share of Population also proved to have good explanatory power. Here, the share of the population that is employed is a proxy for the county's personal income and overall economic activity. The higher the percentage of the population employed, the more likely it is that some Bingen and White Salmon residents will work in Hood River and/or will have more disposable income to spend in sales-tax free Oregon, attracted by shopping opportunities such as Wal-Mart not available on the Washington side. Overall, the econometric traffic model explains 81% of the historical variation in bridge traffic.

In addition, a monthly time-series model was developed to fit historical bridge traffic in order to forecast future monthly seasonality. Time series models isolate growth trends from cyclical effects to fit a model that produces forecasts based solely on the historical data. They tend to do an excellent job of short-range forecasting and are superior to simple growth trend forecasts; however, long-range time series forecast accuracy can be subject to debate because they do not consider possible changes in the causes of traffic demand or other outside influences. In this case, the time-series model was used to provide monthly seasonal traffic detail which was then applied to the quarterly econometric model

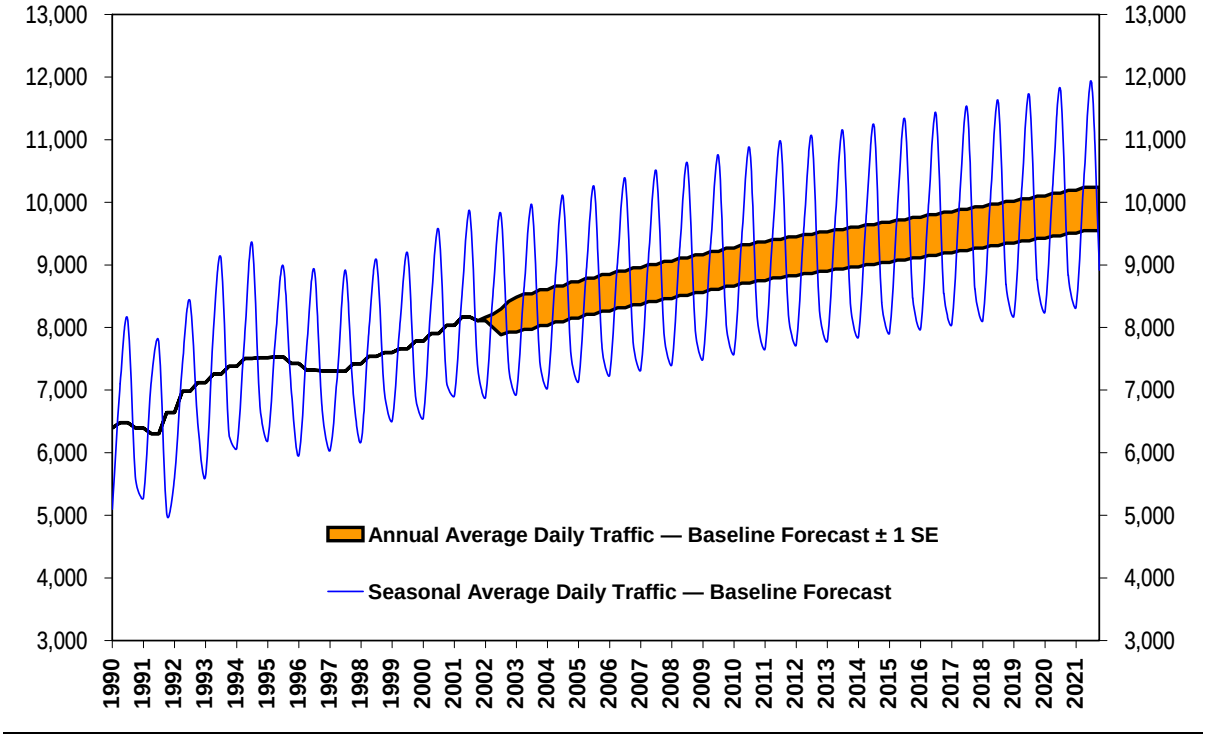
[1] Census X-11 procedures were used to create multiplicative seasonal adjustment factors.

[2] "Good explanatory power" means a statistically significant model coefficient at the 95% confidence level.

traffic forecasts. It is worth noting that both forecasts were within 3% of each other when projecting the 20 year demand forecasts.

Figure 1 presents the historical and 20-year baseline forecast for Hood River Bridge use, expressed in annual average daily traffic (AADT) volumes. Note that the historical trend line becomes a band as it enters the forecast horizon. This band represents a ±1 standard error interval for the forecast, which encompasses a 70% confidence interval. In addition, the monthly seasonality of the mean forecast (band center) is superimposed over the forecast trend.

Figure 1
History and Baseline Forecast of
Hood River Bridge Average Daily Traffic



It should be noted that the toll rate, expressed in real or constant dollars, was tested as a model explanatory variable, but was not found to be significant. Despite a lack of toll increases, and thus, a declining real toll for nearly all of the bridge history, the real toll did increased slightly between 1990 and 2001, due to a nominal toll increase of 25¢ in late 1994. As such, the assumption for the baseline forecast horizon is that the real toll remains approximately constant. In other words, the baseline forecast assumes that periodic adjustments to the nominal toll are only intended to compensate for inflation.

Survey Toll Opinions and Elasticity Concepts

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

Toll Elasticity of Demand

The concept of demand sensitivity to changes in tolls is referred to as the elasticity of demand. The elasticity coefficient is simply the percentage change in traffic divided by the percentage change in toll. Although the elasticity coefficient is a negative number, since demand decreases for a toll increase, it is usually discussed in absolute value terms. If the absolute value of the coefficient is less than 1.0, demand is said to be inelastic. Therefore, a marginal toll increase causes a relatively small decline in demand such that overall revenue increases.

However, the elasticity of demand is not constant across different toll rates. As bridge tolls rise to consume a larger share of a user's budget, the user becomes increasingly sensitive to further increases, and thus more likely to travel less in order to limit total expenditures. Demand is said to become less inelastic (or more elastic) as the real toll-rate increases. When the absolute value of the elasticity coefficient exceeds 1.0, demand becomes elastic. Therefore, a given percentage increase in the toll would cause a larger percentage reduction in demand, such that overall revenue actually declines. At the cross-over point of 1.0, demand is said to be unit elastic, and revenue is maximized. This relationship implies that there are limits to how much revenue can be generated by tolls.

The elasticity of demand may also rise over time, if the real toll is sufficiently high that existing travelers are induced to seek alternatives, form carpools, or combine trips together. The long term nature of demand to become more elastic, can be partly offset by overall growth in travel demand, due to a rising population base.

Analysis of Survey Results

Participants in both the phone survey and the motorist intercept survey were asked a series of questions regarding their willingness to pay tolls for their current or most recent trip across the bridge. The results of these responses were used to gauge potential travel behavior with higher toll rates, and thus, estimate demand elasticity. Elasticity estimates were then paired with the traffic forecasts to consider the possible range of revenue. While the methods provide a preliminary gauge of potential toll revenue, they are not considered "investment grade" toll traffic and revenue forecasts from which an owner would seek market financing. The latter would require considerable resources, time and market research involving in-depth stated-preference surveys, that were beyond the scope of this study.

The survey analysis and results indicate that bridge traffic demand is generally inelastic, such that there is a range of toll increases that will generate more revenue. For tolls between $0.75 and $2.00 per one-way trip, overall elasticity of demand ranges between –0.25 and –1.00, albeit with variation between different market segments (i.e., trip purpose, frequency of use, user demographics, etc.) Using these outcomes, a series of matrices were developed that identify the revenue maximizing toll-rate for different market segments. Table 1 presents the matrix of maximum revenue toll-rates and percentage shares of overall travel, for market segments identified from the intercept survey.

Table 1
Intercept Survey Revenue Maximizing Toll by Market Segment

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

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

As shown in Table 1, the overall maximizing toll rate is $2.00. Demand for most of the market segments did not fall off sufficiently fast to lower total revenue at tolls between the current 75¢ and $2.00. Only two market segments had a revenue maximizing toll of less than $1.50. The demand characteristics of moderately infrequent users (2-4 round-trips per week) that were either Oregon residents or surveyed on a weekend yielded a revenue maximizing toll of $1.00. Combined, these two groups represent only 10% of existing monthly bridge use.

Table 2 presents the matrix of maximum revenue toll rates and percentage shares of overall travel for various phone survey market segments. Note that the phone survey responses to willingness to pay tolls may not be as robust as the intercept survey, because although respondents were asked to consider their most recent trip across the bridge, there is a tendency to answer such survey questions considering an "average" or "usual" trip, which tends to blur the true variability in travel behavior.[3] Nonetheless, the overall revenue maximizing toll rate was also $2.00 for

[3] Only those phone respondents who had used the bridge in the past week were asked the toll questions.

the phone survey respondents. However, in this case, demand appears to be stratified into subgroups with different revenue maximizing tolls. For one group, comprised of the two age extremes (young adults and senior citizens) and/or the lower income category, revenue is maximized at a $1.00 toll and demand falls off rapidly above that. For the other group, comprised of respondents age 25 to 65 and/or mid-to-high incomes, demand falls off rather slowly to at least $2.00, suggesting that this dollar value would be the revenue maximizing toll.

Overall, the predicted level of revenue at $2.00 is insignificantly greater than the revenue projected at $1.00, though both exceed the revenue projected at $1.50. The advantage of analyzing the phone survey data is the ability to see how factors such as age and income affect willingness to pay tolls, questions which would have made the intercept survey too long. However, there are shortcomings to this approach as well — namely that the phone survey results cannot be expanded to approximate monthly bridge use and correctly weight the responses according to actual travel patterns by day of week, state of residence, or other relevant demographic stratification.

Table 2
Phone Survey Revenue Maximizing Toll by Market Segment

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

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

Proposed Toll Policy and Financing Options

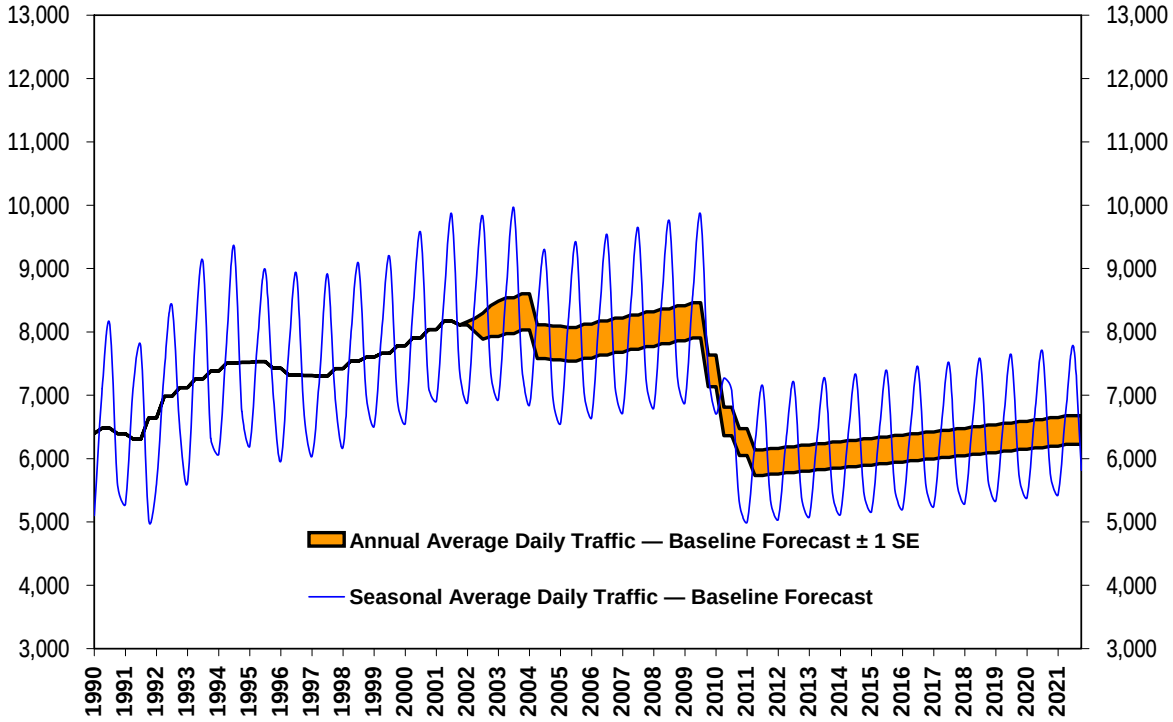
The following presents a proposed toll policy for a new crossing and considers the toll revenue and bond financing capacity of this toll structure.

Revenue Maximizing Toll Rate and Traffic Forecast

The survey results indicate that the revenue maximizing toll is upwards of $2.00. Considering that demand may become elastic over time, and to err on the side of favoring greater mobility, the revenue maximizing toll was conservatively estimated at $1.50 in year 2001 dollars. This is equivalent to $1.75 in 2010 dollars, the year in which a new crossing would realistically open. Until then, it may be politically unacceptable to implement the full increase in the real toll from the existing 75¢; however, the financial feasibility will be improved by implementing a portion of the toll increase as soon as possible and dedicating the additional revenues to replacement costs.

The assumption of this financial analysis, which will be explained in more detail later herein, is that the nominal toll would be bumped to $1.00 in 2004 and to $1.75 in 2010. Using the estimated elasticities, this yields a new, lower traffic projection, as shown in Figure 2.

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



Toll Policy Considerations

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

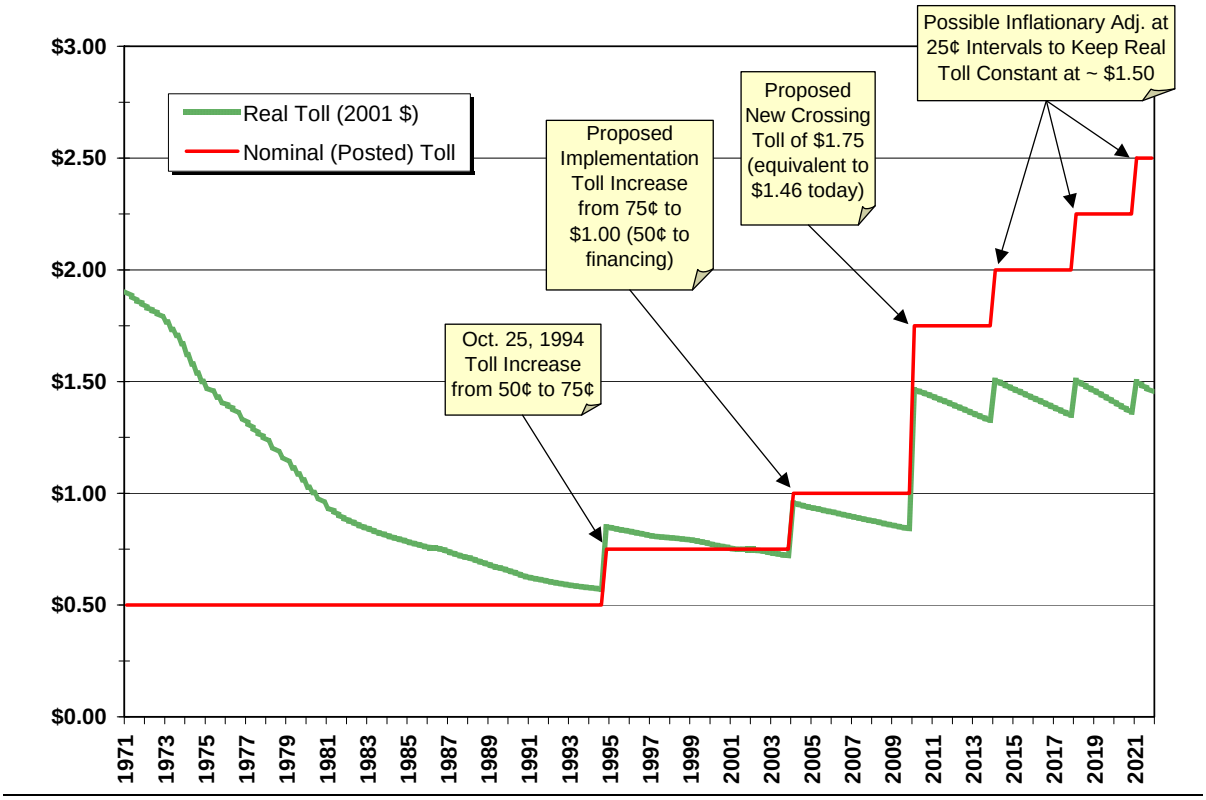
A major re-decking of the existing bridge will be necessary in the next several years. This re-decking will be particularly important if there are no bridge replacement plans under consideration. The Port recognizes that this $7-8 million project is looming, and will likely need to sell bonds to finance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

Assuming that the State of Oregon (or Washington) decides to form a toll bridge authority to implement a state-owned replacement crossing, there may be an opportunity to forge an agreement with the Port of Hood River. The agreement with the Port could be to both raise the existing toll during design and construction, and capture part of this revenue to help finance the cost of the new crossing. This might be done in exchange for the state agreeing to retire the existing bridge as part of the overall project cost. Such an agreement would require the passing of a resolution by the Port Commissioners.

For purposes of this financial analysis, it was assumed that commencement of a state-directed replacement project could eliminate the need to do a full re-decking of the existing bridge. If this were the case, lower cost and shorter-term repairs and maintenance could be undertaken in the interim. It was further assumed that the Port could complete interim maintenance and other necessary repair activities on the existing bridge and continue normal operations through 2010, with a 2003 year-end projected R&R fund balance of $2.7 million and an ongoing 50¢ from each standard vehicle toll.

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 would increase to $1.75 (equivalent to $1.50 in 2001 dollars), with periodic inflationary increases at 25¢ intervals to keep the real toll approximately constant. The existing oversize vehicle toll multipliers and frequent user discount policies via prepaid toll coupons are assumed to remain in place. Figure 3 depicts a history of the nominal and real toll rates since 1971, as well as the proposed nominal toll increases and resulting real tolls forecasted out to 2021. Note that at no time is the proposed toll rate higher in real terms than the 50¢ toll was in 1975.

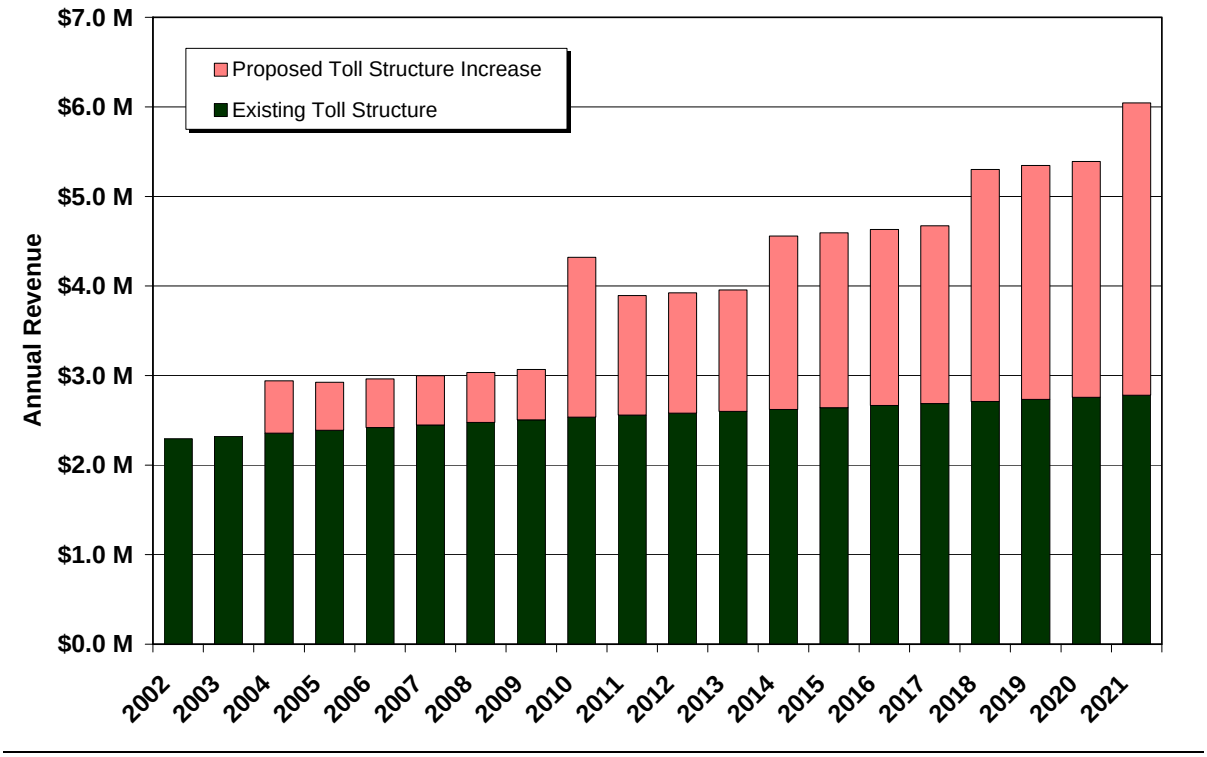
Figure 3
Historical and Proposed Nominal and Real Toll Rates



Revenue under Proposed Toll Structure

Figure 4 shows the projected revenue under the current toll structure and the additional revenue that would be generated with the proposed toll policy. The dark bars indicate the revenue generated from the baseline traffic forecast, whereas the lighter bars show the net additional revenue from the higher tolls (and their corresponding lower annual traffic projections). The 2004 toll increase to $1.00, the 2010 increase to $1.75, and periodic inflationary increases thereafter are reflected in Figure 4 as well. Given that the 2010 increase is relatively substantial at 75%, the projected decrease in demand is assumed to lag behind the toll increase, with the full effect not taking place until mid 2010. As such, the revenue expected in the first year of operation for the new crossing will likely be higher than in the immediately successive years. No ramp-up period is expected, since tolls are not new to this crossing.

Figure 4
Projected Revenue for Existing and Proposed Toll Rates



Toll Revenue Financing Capacity

Figure 4 indicates that when the new crossing opens in 2010 the annual toll revenue potential is approximately $4 million. Considering the forecast traffic volume range indicated in Figure 2, the proposed $1.75 toll in 2010 is expected to yield between $3.5 and $4.5 million per year.

Nominal revenue would be expected to eventually increase with traffic growth and inflation; however, the financial markets would tend to consider only initial revenues to be available as leverage in borrowing for capital investment.

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

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

The latter assumption regarding debt service coverage ratio means that the cash flow available for debt service — toll revenues less any costs that must be paid out of toll revenues — must exceed the annual principal and interest payments on the bonds by 20%. This is a typical requirement of the bond holders and financial markets, which must be met in order for the borrower (the state or toll authority) to achieve/maintain a good credit rating and receive an interest rate and other credit terms commensurate with that credit rating.

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

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

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

Assuming construction occurs over three years from 2007 through 2009, construction cost estimates in today's dollars should be escalated by at least a factor of 15% to account for projected inflation.

Finally, it should be kept in mind that the $1.50 estimated revenue maximizing toll is equivalent to a toll of $1.75 in 2010, rounded to the nearest quarter. And 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% more revenue net of its demand impacts.

Annual Revenue Required to Solely Finance a $150 Million Project

Assuming a project cost of $150 million in today's dollars, the question may be asked as to what is the equivalent one-way toll, assuming the current traffic volumes, needed to finance this level of investment. While it is unrealistic to assume that the resulting toll would not cause traffic demand to decrease considerably, such a measure can nevertheless help establish perspective and convey the message that tolls alone cannot finance a project with these characteristics.

Put another way, what annual revenue stream, regardless source, would be needed to finance a $150 million project cost with no up-front funding or grants? For this analysis, the revenue impacts of higher tolls paid by trucks, RVs, and trailers, as well as the discounts given to frequent users who purchase prepaid toll coupons have been ignored.

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

Summary of Findings

- Construction of a new crossing would not likely begin before 2007, with a projected opening date at the beginning of 2010. As such, any cost estimates in today's dollars should be escalated by at least 15% for interim inflation.

- 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. If implemented, annual traffic demand would likely drop by approximately 30-35% relative to the current nominal toll of 75¢, which is 63¢ in 2010 dollars.

- In 2010, this toll is expected to generate between $3.5 and $4.5 million in gross revenues before O&M costs. O&M costs are estimated at approximately $0.5 million per year in today's dollars.

- 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 (the borrowing of additional funds to make loan payments during construction).

- Under the proposed toll structure with an increase to $1.00 in 2004 and to $1.75 in 2010, combined with 50¢ of each toll set aside for capital costs between 2004 and 2010, toll revenues appear capable of financing upwards of $50 million in project costs.

Other Local Revenue Potential

Funding Needs

For the purposes of this analysis, it was assumed that approximately $1 to $2 million annually would need to be raised from local funding sources over the next 20 years. It is assumed that the bridge will be funded 50% by state and federal sources, and 50% by local sources (either toll revenues or another local revenue source).

Equitable cost distribution

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

Inter-State Cost Distribution

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

However, there are two issues that modify this initial assumption. One is that Oregon residents benefit from Washington residents' trips to Oregon, through access to a wider labor pool and a larger consumer market 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. Klickitat and Skamania Counties are mostly rural, and the small municipalities in the immediate study area (White Salmon and Bingen) are much smaller than the city of Hood River—both in terms of population and in commercial and industrial activity. Assuming a given tax rate, revenues from property taxes, sales taxes, gas taxes, and other taxes on the population and employment base will raise less revenue in White Salmon and Bingen than in Hood River.[4]

[4] Note: Oregon does not currently have a sales tax.

Intra-State Cost Distribution

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.

Table 3
Intercept Survey Washington Bridge Users
by Zip Code of Residence

Zip Code	% of WA Users
White Salmon	36.8%
Bingen	13.7%
Underwood	7.7%
Trout Lake	6.6%
Carson	6.0%
Lyle	4.4%
Glenwood	2.2%
Husum	1.6%
Stevenson	1.6%
Vancouver	7.1%
Other WA	12.1%
Total	100.0%

Considering the Washington side. White Salmon residents made up 37% of WA respondents to the motorist intercept survey, and Bingen residents composed 14% of WA respondents.[5] About 27% of WA respondents were from unincorporated areas in Western Klickitat County (Lyle, Trout Lake, Glenwood and Husum) and Eastern Skamania County (Carson and Underwood). Together, these communities were the home of 78% of Washington respondents. Because of the availability of other bridges to the west and east (Bridge of the Gods from Skamania County and the U.S. 97 and 197 bridges from Klickitat County), the current SR-35 crossing does not attract many users from beyond these communities. In fact, more of the remaining 22% of Washington respondents were from Vancouver rather than elsewhere within Klickitat or Skamania Counties. Central and Eastern Klickitat Counties were not represented in the motorist intercept survey; no respondents reported their home location as Goldendale. The same was true of Western Skamania County, with only 1.6% of Washington respondents coming from Stevenson.

The data above show that most of each County's population in Washington is probably beyond the immediate benefit area of the SR-35 crossing. For this reason, countywide funding sources from Klickitat or Skamania County are not recommended as the primary source of revenue. At the same time, it is important to keep in mind that White Salmon and Bingen residents may compose only half of the Washington users, so that taxes within those cities would be subsidizing users

[5] Note that residency within the city's zip code probably extends beyond the current city limits. This is likely to overstate the number of users who live within the city limits of Bingen and White Salmon, but not the number of users in that general area of southwestern Klickitat County.

from elsewhere in Washington. In short, relying only on countywide taxes would tax too many non-users, while relying only on city taxes in White Salmon and Bingen would not adequately tax all users, in comparison to a strict user-pays system like tolls. One option to address this would be a two-tiered system, consisting of a basic countywide tax, supplemented by a city tax within the municipalities of White Salmon and Bingen, residents of which would benefit more than other county residents due to their proximity to the bridge.

Table 4
Intercept Survey Oregon Bridge Users
by Zip Code of Residence

Zip Code	% of OR Users
Hood River	39.7%
The Dalles	8.8%
Mosier	8.8%
Cascade Locks	1.5%
Portland	17.6%
Other OR	23.5%
Total	100.0%

Considering the Oregon side, there are relatively few users from Wasco County, essentially ruling out a countywide tax source. Especially considering that Wasco County has the U.S. 97 and 197 bridges within its jurisdiction. Hood River County, in contrast, has less land area than either Skamania or Klickitat County, and the bridge's benefits may extend countywide in addition to being concentrated to the city of Hood River. Survey data do not reveal how many bridge users are from within the city limits of Hood River versus the unincorporated areas near Odell, Dee, and Parkdale, but they do show that few users are from Cascade Locks in the western part of the County. A conclusion is that a countywide tax would be more equitable here than for the Washington counties; it would still include many residents who may not be frequent bridge users, but a tax within only the city of Hood River would probably miss too many bridge users from elsewhere in the County. In this case, as with Washington, it might be possible to have a two-tiered taxing system that combines a countywide tax with a citywide tax within Hood River, so that everyone in the county pays some amount of tax toward a new bridge crossing, but those living in the city of Hood River pay an additional amount because of the higher benefits they receive from their proximity to the bridge.

Other Considerations: Revenue Potential and Administrative Ease

The assignment of costs to users is not the only factor to consider. Whether a funding source can generate enough revenue, within the relevant political and legal constraints, to justify the administrative effort necessary to collect and administer the revenue stream is also very important. For this reason sources that would generate very little revenue while requiring special legal authorization or complicated new administrative systems would not be recommended. The local

revenue source that seems to fare the best under the criteria of revenue potential and administrative ease is the local property tax. It has a large base, and administration procedures are already in place.

Local sources: Washington

For the purposes of this analysis, it is assumed that roughly half of the $1 million to $2 million needed from non-toll local sources will come from Washington, and the other half will come from Oregon. Therefore, local sources with approximately $500,000 to $1 million in revenue were reviewed.

Property Tax

Countywide

Washington counties are limited to a tax rate of $1.80 per $1000 of assessed value (AV) for the county's General Fund, and $2.25 per $1000 AV for the county's Road Fund. Klickitat County's rates are less than this maximum, at $1.46 for non-Road Fund activities and $1.93 for the Road Fund. Therefore, there is potential for up to a 23% increase in non-Road Fund tax rates and 16% increase in Road Fund tax rates. The Road Fund levy is not applied in the incorporated cities of Goldendale, White Salmon, or Bingen.

Referendum 47, passed in 1997, limits the annual increase in the tax levy (the combination of the tax rate and the assessed valuation of existing construction) to inflation or 6%, whichever is less. Voters can, however, increase taxes for "special" levies that support bonds for capital construction. The requirement is at least 60% approval by at least 40% of the number of voters who participated in the previous general election. The tax rate must still be below the maximum amount stated in the previous paragraph.

Table 5
Revenue Potential from Klickitat County Property Tax Increase

	Additional Road Fund Rate (per $1000 AV)			
Additional General Fund Rate (per $1000 AV)	$0.00	$0.07	$0.17	$0.31
$0.00	$0	$66,812	$162,258	$295,882
$0.14	$174,754	$241,567	$337,012	$470,636
$0.34	$424,404	$491,216	$586,662	$720,286

Source: ECONorthwest based on Klickitat County Assessor's Data

Citywide

Washington cities are limited to $3.60 per $1000 AV, with up to $0.50 of that for library districts and up to $1.50 for fire districts. Neither Bingen nor White Salmon have fire districts, but they do belong to the county library district, which levies a

$0.50 rate, leaving a $3.10 rate available for each city. Bingen is currently at its maximum levy of $3.10, while White Salmon's permanent rate is $1.89, plus a special bond levy of $0.62. At present, therefore, White Salmon has approximately $0.59 per $1000 AV available in taxing capacity, which would represent a 24% increase over the current tax rate. As with the county tax, voters would need to approve such an increase with at least a 60% majority. State law limits the annual tax levy increase for cities with populations less than 10,000 to 6% (those with populations greater than 10,000 are limited to 6% or inflation, whichever is less).

As shown in the table below, raising the property tax rate in White Salmon to the maximum level would raise less than $70,000 annually.

Table 6
Revenue Potential from City of White Salmon
Property Tax Increase

Additional Tax Rate per $1000 AV	Additional Revenue
$0.15	$17,435
$0.30	$34,870
$0.45	$52,306
$0.59	$68,578

Source: ECONorthwest based on Klickitat County Assessor's Data

Port District

Port Districts in Washington are allowed to levy up to 45¢ per $1000 AV and can use the revenue for transportation projects within the district. The Port of Klickitat currently levies $0.23 per $1000 AV, collecting $151,500 in 2002. Raising the levy to the maximum amount would only raise an additional $145,000 annually.

Table 7
Revenue Potential from Port of Klickitat Property Tax Increase

Additional Tax Rate per $1000 AV	Additional Revenue
$0.10	$66,011
$0.15	$99,016
$0.22	$145,224

Source: ECONorthwest based on Klickitat County Assessor's Data

Local Sales & Use Tax

Countywide

Counties in Washington are allowed to levy a 0.5% sales and use tax, and all counties presently have this measure in place. Counties are also allowed to levy an optional, additional 0.5% sales and use tax that is subject to voter referendum. Klickitat and Skamania Counties are two of the three counties that do not levy this

additional tax, presumably due to the negative effect it would have on sales within the counties given the proximity of tax-free shopping opportunities available in Oregon. Counties receive 15% of the revenues from cities within the county, as long as the county rate is at the city rate. Because White Salmon and Bingen's city sales tax rates are 0.5%, Klickitat County currently gets 15% of the sales tax revenue from those two cities. If Klickitat County chose to impose the additional 0.5% tax, it would receive the entire additional amount in those two cities, unless either of the cities also decided to impose the additional tax, in which case the County would get its standard 15% of city revenue. By raising its sales tax to the level of Goldendale, the County would also get 15% of Goldendale's sales tax revenue.

As shown in the table below, a sales tax increase of 0.5% in Klickitat County would generate just over $870,000 annually if White Salmon and Bingen did not impose the additional tax, assuming that sales remained at 2001 levels. In reality, the sales tax increase might lead to a decrease in local purchases and more purchases in nearby Skamania County (with a lower tax rate) or, more likely, across the river in Oregon. If this occurs, the loss in revenue faced by local business owners could very well outweigh the fiscal benefits to the County, especially in the cities along the river like White Salmon and Bingen.

Table 8
Revenue from a 0.5% Sales and Use Tax in Klickitat County

	% Decline in Sales		
	0	-1%	-5%
Without City increase	$871,675	$862,958	$828,091
With City increase	$623,491	$617,256	$592,317

Source: ECONorthwest based on 2001 WA Dept. of Revenue data

White Salmon and Bingen

Cities in Washington, like counties, all impose a 0.5% sales and use tax, with an optional additional 0.5% tax subject to voter referendum. White Salmon and Bingen are among several cities on the border with Oregon that do not levy the full amount. If they did, and Klickitat County stayed at 0.5%, these two cities would get all the taxes resulting from the additional revenue. If Klickitat County followed suit, 15% of the revenues would go to the County. Again, price elasticity of demand is an important issue. Given the tax-free shopping available Oregon, an additional sales tax would probably decrease sales volume in Bingen and White Salmon, and the loss of revenue to local business owners might not justify the small increase in sales tax revenues to the city governments.

Table 9
Revenue Increase from a 0.5% Sales and Use Tax in White Salmon and Bingen

	% Decline in Sales		
	0	-5%	-10%
Without County increase	$166,368	$158,050	$149,731
White Salmon	$110,341	$104,824	$99,307
Bingen	$56,027	$53,226	$50,424
With County increase	$141,413	$134,342	$127,272
White Salmon	$93,790	$89,100	$84,411
Bingen	$47,623	$45,242	$42,861

Source: ECONorthwest based on 2001 WA Dept. of Revenue data

Local Option Vehicle License Fee

Washington State law allows counties to levy up to $15 annually per vehicle license issued. The revenues are shared with the cities in the county on the basis of population, but with the unincorporated population of the county weighted 1.5 times (as with the local option gas tax). Voter approval is not required, but the fee is subject to repeal through voter referendum. Cowlitz County implemented this fee, but it was subsequently repealed by voters. At present, only King, Snohomish, Pierce, and Douglas Counties impose this $15 fee.

Elasticity of demand is not a huge issue with this fee, as most people will still choose to have a licensed vehicle, and they do not have any legal options for licensing it outside their county of residence. Based on 2001 data, it is estimated that a $15 fee would raise about $218,000 annually for Klickitat County, assuming vehicle registration numbers remained constant.[6] White Salmon's and Bingen's shares of the revenue would be quite small.

Table 10
Revenue Potential of Local Option Vehicle License Fees within Klickitat County

	$5	$10	$15
Klickitat County (unincorp.)	$72,773	$145,547	$218,320
White Salmon	$8,485	$16,970	$25,455
Bingen	$2,586	$5,171	$7,757
Goldendale	$14,346	$28,692	$43,038
Total Countywide	$98,190	$196,380	$294,570

Source: ECONorthwest based on April 2002 data from WA Department of Licensing

[6] This includes not only passenger vehicles, but also trucks less than 6000 pounds, which currently pay the combined licensing fee (CLF).

In March 2002, the Washington legislature authorized an annual vehicle registration fee of up to $100 for counties who present the option to voters along with a list of the projects the fee would fund. Cities within the county would get 15% of the revenues, the county would get 15% of the revenues, and the rest would be allocated through the state for projects identified in transportation improvement plans. State or local roads would be eligible. It is more likely that a $15 fee would be approved by Klickitat County voters than a $100 fee.

Local Option Gas Tax

State law allows counties to enact a local option gas tax of up to 10% of the state rate, which would be 2.3¢ per gallon at today's state rate of 23¢ per gallon. Countywide voter approval is required. The revenue would be shared on a per capita basis with the cities within a county, but the unincorporated population would be weighted 1.5 times. At present, no counties have implemented this local option gas tax.

No data is available on how much gas is purchased within Klickitat County, but if we assume that it is roughly proportional to population, we can assume that roughly 0.323% of the state's annual 2.7 billion gallons of gasoline consumed annually would be purchased in Klickitat County.[7] At 2.3¢ per gallon, this would raise approximately $194,000 annually for the County and its cities. In fact, the amount of revenue raised might be less due to elasticity issues. More drivers might purchase their gas in Skamania County or Hood River County if this tax were implemented.

Table 11
Revenue from a Klickitat County Local Option Gas Tax

	% Decline in Gas Sales		
	0	-5%	-10%
1-cent increase	$86,068	$81,765	$77,461
County (unincorporated)	$63,789	$60,600	$57,410
White Salmon	$7,437	$7,066	$6,694
Bingen	$2,266	$2,153	$2,040
Goldendale	$12,575	$11,946	$11,317
2.3-cent increase	$197,957	$188,059	$178,161
County (unincorporated)	$146,715	$139,380	$132,044
White Salmon	$17,106	$16,251	$15,396
Bingen	$5,213	$4,952	$4,692
Goldendale	$28,922	$27,476	$26,030

Source: ECONorthwest based on U.S. Dept. of Energy data on state gas consumption and 2001 population figures from WA Office of Financial Management (OFM).

[7] In 1999, 7.3 million gallons of gasoline per day were consumed in Washington. Source: web site of Energy Information Administration, U.S. Department of Energy. Population figures from 2001 estimates by Washington Office of Financial Management (OFM).

Local Real Estate Excise Tax

Cities and counties may each levy a 0.25% real estate excise tax on the value of real estate transactions within their jurisdiction, and the proceeds can be used for any local capital improvements, including bridges. If both a city and its county levy the tax, the revenue goes to the city. Klickitat County and all three incorporated cities (Goldendale, White Salmon, and Bingen) levy this 0.25% tax.

Counties and cities that are not imposing the optional 0.5% sales tax allowed by law can levy an additional 0.5% real estate excise tax. Klickitat County and its cities would be eligible for this tax increase. The dampening effect on real estate sales would probably be less than the effect of a sales tax increase, since demand is not as transferable to neighboring areas, but it is still possible that demand could have some elasticity. No counties and only two cities in Washington currently impose this optional real estate excise tax.

Table 12
Revenue from an Additional 0.5%
Real Estate Excise Tax in Klickitat County

	% Decline in Value of Real Estate Transactions		
	0	-0.5%	-2%
Klickitat County (unincorporated)	$793,694	$789,726	$773,931
White Salmon	$44,536	$44,313	$43,427
Bingen	$8,998	$8,953	$8,774
Goldendale	$23,138	$23,022	$22,562
Countywide Total	$870,366	$866,014	$848,694

Source: ECONorthwest based on data from Klickitat County Treasurer's Office

Local Improvement Districts

Local improvement districts (LIDs) are allowed by state law in both Washington and Oregon. They are generally small and pay for improvements that are deemed to be of uniquely local benefit to certain property owners, who then pay an assessment over time that covers the cost of the improvement. In both states a LID can be formed by a petition of the property owners who own a majority of the affected property, or by the County Board or City Council.

LIDs are probably not an appropriate funding mechanism for the SR-35 crossing, because the benefit of the bridge cannot be easily aligned with a select group of property owners, as would typical LID projects like sidewalk construction and local street improvement. The SR-35 crossing would have a benefit extending at least within the city limits of White Salmon, Bingen, and Hood River. In addition, LIDs are difficult to set up and administer. They are also meant to be based on an increase in property values occasioned by the local improvement, and the SR-35 crossing would probably not result in a clear increase in property values as it is, in part, a replacement of an existing facility.

Tax Increment Financing

Tax increment financing (TIF) is based on a similar principle as LIDs—that a local public improvement will create a rise in adjacent property values, and the benefiting property owners can therefore pay for the improvement. In this case, though, property owners do not pay an additional amount beyond their normal tax rate; rather, the costs are paid by an increase in tax revenue that results from the increase in property values beyond a baseline amount. As with LIDs, a TIF program is probably not appropriate for the SR-35 crossing because the benefits are too diffuse, and the new bridge may not clearly increase property values. Moreover, in Washington there have been legal problems with authorizing the use of TIF; most forms were ruled unconstitutional by the State Supreme Court in 1995 and would likely require a change to the state Constitution to implement.

Local Sources: Oregon

Property Tax

Countywide

Oregon property taxes are limited to a tax rate of $10 per $1000 of real market value (RMV) for non-school expenditures. All areas of Hood River County are below this limit at present; the highest rate within the County is about $5.60 in the City of Hood River. This translates to a rate just over $7 per $1000 of assessed value (AV, which is less than RMV), consisting of $1.69 from the County, $3.16 from the City of Hood River, and the rest from other districts like the park district, the port district, the transit district, and the community college district.[8] The County could therefore raise its taxes by nearly $4 per $1000 RMV without exceeding this Measure 5 cap, assuming other taxing districts within the County did not raise rates.

As a result of Measure 50, passed in the late 1990s, property tax rates in Oregon are frozen, and any increase to the tax rate can only be temporary for short-term operating expenses or the repayment of bonds for capital construction. The increases must be approved by voters with a "double-majority" where at least 50% of registered voters vote, and a majority of those approve the measure.

A property tax increase to support bonds related to construction of a new SR-35 crossing has large revenue potential.

[8] Source: Oregon Department of Revenue web site; figures for 2000-01.

Table 13
Revenue from Property Tax Increase in Hood River County

Additional Tax Rate per $1000 AV	Additional Revenue
$0.10	$111,040
$0.25	$277,599
$0.50	$555,198
$1.00	$1,110,396
$2.00	$2,220,792

Source: ECONorthwest based on Hood River County Assessor's data

Citywide

Oregon cities are subject to the same property tax limitations as described above with respect to counties. Any increase to the property tax rate would have to be approved by voters, and the combined increase of the county, the city, and other taxing districts could not exceed the approximately $4 per $1000 RMV that remains under the Measure 5 cap.

Because the assessed valuation within the City of Hood River is little more than one-third that of the entire county, a larger tax rate increase is necessary to generate comparable revenues.

Table 14
Revenue from Property Tax Increase in the City of Hood River

Additional Tax Rate per $1000 AV	Additional Revenue
$0.25	$86,681
$0.50	$173,362
$1.00	$346,724
$2.00	$693,449
$3.00	$1,040,173

Source: ECONorthwest based on Hood River County Assessor's data

Port District

Port Districts in Oregon are allowed to levy up to $2.50 per $1000 RMV. The Port of Hood River currently levies only $0.0332 per $1000 AV; the amount per RMV is probably even less. The collections are only about $40,000 per year, making up only about 1% of the Port's annual budget. An increase in the tax rate could generate substantial revenue if the rate approached the maximum allowable. However, use of this mechanism would likely assume that the Port is at minimum a partner, and most likely, remains the owner/operator of the SR-35 bridge.

Table 15
Revenue from Property Tax Increase by the Port of Hood River

Additional Tax Rate per $1000 AV	Additional Revenue
$0.25	$259,245
$0.50	$518,490
$1.00	$1,036,981
$1.50	$1,555,471
$2.00	$2,073,961

Source: ECONorthwest based on Hood River County Assessor's data

Local Option Vehicle Registration Fee

Oregon counties are authorized to impose a $15 annual fee on vehicle licenses within the County, if voters approve. Agreement must also be reached among the cities and the county on how the revenue will be spent. No counties currently impose this fee, though several have tried unsuccessfully to win voter approval. Multnomah, Clackamas, Marion, Umatilla, Washington, and Yamhill Counties all tried unsuccessfully in 1997; as recently as March 2002 a measure in Benton County failed in all 20 precincts with an overall 75% rejection rate.

If Hood River County were successful in convincing voters to pass the $15 vehicle registration fee, nearly $400,000 annually could be raised, assuming vehicle registration numbers remained constant.

Table 16
Revenue from Local Option Vehicle Registration Fees within Hood River County

	$5	$10	$15
Hood River County	$130,925	$261,850	$392,775

Source: ECONorthwest based on 2001 vehicle registration data from Oregon Dept. of Transportation, Financial Services Division.

Local Gas Tax

State law allows Oregon counties and cities to impose a gas tax of up to 3¢ per gallon, subject to voter approval. Most attempts at securing voter approval have failed, but the cities of Woodburn, Tillamook, The Dalles, and Pendleton all have a local gas tax, as do Multnomah and Washington Counties. Revenues must be shared on a per capita basis among the cities and the unincorporated county.

No data is available on gas consumption within each county or city in Oregon, but if we assume that the 1.64 billion gallons of gasoline consumed annually in Oregon were distributed by population, a gas tax within Hood River County could raise significant revenue. A tax within the city itself would raise less revenue because there are gas stations in nearby unincorporated parts of the County that would probably increase their share of sales if gas prices were higher within the city limits.

If a countywide gas tax were passed instead, elasticity and substitution of demand would probably not be a large issue, unless people drove to nearby Mosier in Wasco County to save a few pennies per gallon.

Table 17
Revenue from Local Option Gas Tax in Hood River County

	Local Gas Tax		
	1¢	2¢	3¢
Countywide receipts	$97,313	$194,625	$291,938
County (unincorporated)	$63,537	$127,073	$190,610
City of Hood River	$28,438	$56,876	$85,314
Cascade Locks	$5,338	$10,676	$16,014

Source: ECONorthwest based on Oregon Dept. of Transportation data on statewide fuel consumption and 2001 population data from Portland State University's Population Research Center (PRC).

State Sources: Washington

Gas Tax Distribution

State gas tax revenues from the 23¢ per gallon surcharge are distributed to cities and counties according to a complicated formula that includes population, needs, costs, and a baseline allocation.

The state is proposing a 9¢ per gallon increase in the gas tax, which will be on the ballot this November. A 5¢ increase would occur at the beginning of 2003, and the additional 4¢ would be added in 2004. The statewide financing plan also includes a proposal for a 1% surtax on car sales and a 30% increase in trucking fees. The legislature recently produced a $7.7 billion list of transportation projects that is intended to give voters an idea of what the new fees would pay for.

The gas tax increase would represent a 39% increase over the current statewide gas tax. If Klickitat County received the same share of the increase as it did of total gas tax revenue in FY 2001, nearly $1 million annually in new revenue could come to the County. Revenues to White Salmon and Bingen would be much less. The new revenue, however, may not actually be distributed according to the current formula; it will probably be tied to a specific list of projects (which currently does not include a SR-35 crossing).

Other Funds

Washington has several state grant programs available, but most of them would not be applicable to the SR-35 crossing. The County Road Administration Board (CRAB) administers the Rural Arterial Program (RAP) and the County Arterial Preservation Program (CAPP), but these are limited to county roads. The Transportation Improvement Board (TIB) administers programs that are limited to urban areas.

State Sources: Oregon

Gas Tax Distribution

Oregon's state gas tax revenue is combined with weight-mile tax revenue and revenue from registration fees in the State Highway Fund. About 16% of the State Highway Fund revenue is apportioned to cities on the basis of population, and just over 24% is apportioned to counties on the basis of registered vehicle numbers. Hood River County received $1,078,009 from its State Highway Fund apportionment in FY 2000-01, and the City of Hood River received $231,496. Most cities and counties use these funds for maintenance rather than new capital expenditures. A proposed 5¢ increase to the state gas tax failed at the ballot in May 2000, and no proposed increase is currently on the legislative agenda.

Oregon Transportation Infrastructure Act (OTIA)

The Oregon Transportation Infrastructure Act of 2001 generated $400 million in financing for Oregon road and bridge projects through bonds backed by increased truck fees and auto title fees. Just over $35 million went towards 38 city and county bridge projects. State bridge projects were limited to I-84 and I-5, where the greatest need was deemed to exist.

Though the OTIA 2001 funds have already been awarded, the Governor is proposing a similar OTIA for 2002 that would devote over $750 million towards road and bridge improvements. The plan would be backed by a $15 increase in the annual auto registration fee and an increase to the weight-mile tax on trucks. In addition, some of the state's annual $70 million commitment for bridge repair and construction would be used to back $400 million bonds to meet critical bridge repair needs.

Summary of Findings

- As indicated in the Toll Revenue section, 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.

- The amount of $1 million in annual tax revenue in Washington is the equivalent of $134 per household in Klickitat County. If we limit the revenue requirement to White Salmon and Bingen, we need $853 per household 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.

- Using a tax that charges businesses as well as households, like a property tax, would decrease the household contribution for most households. Raising $1 million annually through a property tax requires $0.80 per $1000 AV in Klickitat

County, or $80 for a house with an assessed value of $100,000. Alternately, it requires $8.60 per $1000 AV in White Salmon. On the Oregon side, raising $1 million annually requires $0.90 per $1000 AV in Hood River County, or $90 for a house with an assessed value of $100,000. It requires $2.88 per $1000 AV in the City of Hood River, or $288 for a house with an assessed value of $100,000.

- The key issue is how the costs will be distributed — will the cost be spread over the greatest number of people so as to avoid excessive burdens on any one, or will the user-pays principle be followed by targeting costs to the municipalities closest to the bridge? Recognizing that all the options in this memo are second-best solutions compared to tolls, in terms of tying costs to benefits received, it may be best to consider exploring a mix of countywide and city-based taxes.

Washington

$1 million in annual tax revenue is attainable from some combination of countywide taxes:

- A property tax increase to maximum limits would raise $296,000 through the Road Fund only or $720,000 if the General Fund tax rate were raised too.
- A 0.5% real estate excise tax increase would raise up to $794,000.
- A 2.3¢ per gallon local option gas tax would raise up to $198,000.
- A vehicle license fee of $15 would raise up to $295,000.
- A 0.5% sales tax increase would raise between $592,000 and $872,000.

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

But if we limit ourselves to the cities of White Salmon and Bingen only, it is impossible to raise $1 million annually, because of the small economic bases of these small towns.

- White Salmon could generate $44,000 from a 0.5% real estate excise tax increase; Bingen could only generate $9,000.
- White Salmon could generate between $84,000 and $110,000 from a 0.5% sales tax increase; Bingen could generate between $43,000 and $56,000.
- White Salmon could generate up to $69,000 from a property tax increase to the maximum rate allowable; the Port district could generate about $145,000; Bingen is already at the maximum rate.

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 use a combination of the following:

- Property tax increases up to the maximum level could generate up to $2.2 million.
- A local option license fee of $15 could raise $393,000.
- A 3¢ gas tax could generate $292,000 annually.

The maximum property tax increase alone would be too hefty an increase, but using all three sources could also be politically problematic.

A property tax increase in the City of Hood River could generate up to $1 million annually, but the rate required would also probably be too burdensome for city residents. A property tax increase by the Port of Hood River (which includes most of the county in its taxing district) could raise up to $2.1 million, similar to Hood River County, but that would go against its traditional minimization of property tax collections.

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

Appendix D – Environmental Review and Coordination

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Tables

Attachments

SR-35 Tier II Technical Memorandum
Environmental Review

Background

During Tier I of the Columbia River Crossing study, baseline environmental data was gathered to describe the natural and built environment of the project study area. Six corridors and a No Action alternative were screened during Tier I, which resulted in carrying forward three corridors (City Center, Existing Low, and East A) and the No Action alternative for further evaluation in Tier II.

During Tier II, alternatives with specific locations identified were developed for the three corridors carried forward from Tier I. More detailed environmental information was developed to assist in the evaluation of these alternatives to determine which alternatives should be recommended for detailed evaluation in the DEIS.

To screen alternatives, environmental criteria were developed to address impacts to: species and habitat, light and glare, noise, plans and policy consistency, geology, water quality/quantity, environmental justice, flood prone areas, indirect and cumulative effects, recreation, and cultural resources. Environmental criteria were developed with input received from resource and regulatory agencies and from the Oregon Collaborative Environmental and Transportation Agreement to Streamline (CETAS) and Washington Merger streamlining committees. Details on the alternative screening, including an analysis of environmental impacts are provided in Appendix F, *Alternatives Screening*.

To support the alternatives screening process, additional surveys and agency coordination was conducted. These activities and results are summarized in this technical memorandum.

Sensitive Plants

Several sensitive plant species were identified during preparation of the Baseline Conditions Report (Parsons Brinckerhoff et al. 2001) as potentially occurring within the study corridors. None of the sensitive plant species identified are currently listed on federal lists of endangered or threatened species. Table 2 in the Baseline Conditions Report shows three federal species of concern – Oregon or Columbia gorge daisy (*Erigeron oreganus)*, white meconella (*Meconella oregana*), and Barrett's penstemon (*Penstemon barrettiae*). Each of these is identified as a candidate for state listing by the Oregon Natural Heritage Program (ONHP). Barrett's penstemon is threatened in Washington.

Documentation received from the ONHP identified each of these species in the vicinity of Hood River. The white meconella was identified on Stanley Rock and about 1.5 miles east of Stanley Rock. Barrett's penstemon was identified about 1.5 miles east of Stanley Rock and 1.5 miles west of the West Hood River Interchange. The Oregon daisy was identified about 1.5 miles east of Stanley Rock.

Documentation in the Master Plan, Columbia Gorge Management Unit, published by the Oregon Parks and Recreation Department (1994) shows locations of white meconella on Stanley Rock and east of that location about 1 to 1.5 miles, which corresponds to the information provided by the ONHP. The Master Plan shows Barrett's penstemon and the Oregon daisy at several locations about 1.5 miles east of Stanley Rock in a portion of Koberg State Park referred to as Upper Koberg. Upper Koberg is south of I-84. Several locations of Barrett's penstemon were identified relatively close to the south side of I-84. None of these species was identified in portions of Koberg Beach State Park closer to Stanley Rock on the river side and upland side of I-84 closer to where a new East Corridor crossing would be located.

The white meconella tends to grow in open areas, such as the top of Stanley Rock, where the ground is wet in spring (Hitchcock and Cronquist 1978). A project biologist in late February 2002 at Stanley Rock did not find any flowering white meconella, although narcissus shooting star (*Dodecatheon poeticum*) was prominently in bloom at that time. Flowering time is short for the white meconella lasting only about one week, typically in late March – early April. The timing of the field visit was probably too early to observe the plant in bloom.

Suitable habitat for the white meconella is not present on the Washington side of the East Corridor and the Oregon side of the Existing and City Center corridors because of existing development. The habitats on the Washington side of the existing corridor tend to be disturbed and wooded, and do not appear to be suitable for the plant. None were observed flowering in late February 2002 by a project biologist. Although there are no known observations of the white meconella on the Oregon side of the East Corridor at the potential location of an interchange, an additional survey would need to be conducted of the preliminary footprint for an interchange, if that option were advanced for further design. Preliminary observations at a potential interchange site do not suggest that suitable habitat is present. Habitats include road embankment, railroad embankment, and wetlands, depending on where the interchange would be located.

Barrett's penstemon has relatively long-lasting flowers between late April and early June. It generally grows in crevices along basalt cliff faces, on ledges of rock outcrops, on open talus and occasionally along well-drained roadsides. Potentially suitable habitat exists in the East Corridor on the Oregon side adjacent to I-84. Further observation will be needed at the location of a potential interchange if the East Corridor is advanced. Observations should be made also at the Washington side of the City Center crossing if that corridor is advanced.

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

Cultural Resource Surveys

Archaeological Investigations Northwest, Inc. (AINW) conducted a cultural resource analysis of the three corridors (AINW, 2002). Six build alternatives are proposed, two in each of the three corridors. This cultural resource analysis describes cultural resources within the three corridors and provides recommendations on additional cultural resource work that might be needed for each build alternative based on cultural resource survey work previously done for other projects in the same area and based on the types of resources present. These recommendations can be used to evaluate the relative impacts to cultural resources and costs for additional cultural resource studies as a means of comparing the possible corridors and build alternatives.

The cultural resource analysis includes the results of archival research, literature review, and reconnaissance-level field inspection. This analysis builds on the AINW cultural resource report prepared for the Tier I phase of the feasibility study (Fagan and Willingham 2000). It also provides recommendations for cultural resource survey and evaluation work that may be needed in the concluding Tier III phase of the feasibility study intended to select a preferred alternative, develop an implementation plan, and complete a draft environmental impact statement.

Methods

This Tier II cultural resource analysis incorporates cultural resource data gathered by AINW in Tier I (Fagan and Willingham 2000). Furthermore, the areas under consideration have been more narrowly defined to include only the three corridors and six build alternatives. The Area of Potential Effect (APE) for each alternative has been more narrowly identified during the Tier II study. This has reduced the number of cultural resources identified in the study area compared to the Tier I data. AINW has also studied more historic-period maps and photographs including those available at the Portland District office of the U.S. Army Corps of Engineers and at the Port of Hood River and the Port of Klickitat.

In addition to the research of records and archives, a field inspection of the proposed corridor and alternative locations was conducted on January 8 and 9, 2002. The field inspection does not substitute for a cultural resource survey as the areas were not systematically covered by pedestrian transects and no subsurface work was conducted. The field inspection does, however, provide information on existing field conditions in locations that represent high-probability areas where archaeological deposits representing prehistoric or historic-period activities may exist.

Results

The existing Hood River Bridge over the Columbia River is one of the cultural resources identified by the project and is affected by all of the action alternatives for the project. Some of the historic-period cultural resources described in this report are linear transportation structures that cross within or near the APE for all of the corridors and build alternatives. These include railroads and highways on both sides of the Columbia River. All of the recorded cultural resources and those unrecorded cultural resources that could be verified as physically extant within the proposed corridors are listed in Table D-1.

Table D-1. Potential Effects on Cultural Resources within the Corridors

CORRIDOR	CITY CENTER		EXISTING		EAST A	
BUILD ALTERNATIVE	NEW BRIDGE	TUNNEL	NEW BRIDGE	RETROFIT OLD BRIDGE	NEW BRIDGE (remove old bridge)	NEW BRIDGE (and retrofit old bridge)
CULTURAL RESOURCES	Hood River Bridge	Hood River Bridge	Hood River Bridge	Hood River Bridge	Hood River Bridge	Hood River Bridge
	Evergreen Highway	Evergreen Highway	Evergreen Highway	Evergreen Highway	Evergreen Highway	Evergreen Highway
	BNSF Railway	BNSF Railway	BNSF Railway	BNSF Railway	BNSF Railway	BNSF Railway
	UPRR	UPRR	45KL688		Treaty Fishing Site	Treaty Fishing Site
	HCRH	HCRH			Houses on E. Steuben	Houses on E. Steuben
		Fan Rock				

BNSF = Burlington Northern Santa Fe; HCRH = Historic Columbia River Highway; UPRR = Union Pacific Railroad.

Recommendations

The current study indicates that rich and abundant archaeological and historical resources are present in the vicinity of the proposed SR-35 Columbia River Crossing corridors. However, only a few previously recorded resources are subject to possible effects of any of the build alternatives. In addition to considering the effects of the build alternatives on previously recorded resources, AINW recommends additional cultural resource work in the corridor recommended for Tier III study. The type and amount of cultural resource work recommended varies between the corridors and according to the build alternative selected. Every build alternative impacts the existing Hood River Bridge and AINW recommends re-evaluation of its eligibility for listing in the National Register of Historic Places (NRHP).

In the City Center Corridor, both the new bridge alternative and the tunnel alternative may impact the Evergreen Highway, the Historic Columbia River Highway, the Burlington Northern Santa Fe Railway, and the Union Pacific Railroad. None of these impacts are likely to be adverse, although the resources would need to be evaluated for significance, and determinations of effect would need to be completed. If roadway improvements are needed at the intersection of the Historic Columbia River Highway and 2nd Street in Hood River, they should conform with the master plan for the highway. If the tunnel alternative is selected, an ethnographic study of Fan Rock is

recommended. Historic-period archaeological materials are likely to be present under dredge fill deposits in the Port of Hood River location. Augering in advance of the construction and monitoring during construction is recommended to avoid impacts to unrecorded archaeological deposits that may exist in this area on the Oregon side of the Columbia River.

In the Existing Corridor, retrofitting the existing bridge would likely affect the historic qualities of the bridge. The possible effects to the historic features, however, would depend on the retrofit design and procedures used in the retrofit construction. Construction of a new bridge parallel and upstream from the existing bridge may also affect the Burlington Northern Santa Fe Railway, the Evergreen Highway, and archaeological site 45KL688. Impacts to the railway and highway would need to be evaluated and effects determined. Archaeological site 45KL688 may be more sensitive to construction disturbances and evaluation of the site's eligibility for listing in the NRHP is recommended if the new bridge alternative is selected. Archaeological field survey work is also recommended for both shores of the corridor if either alternative in the existing corridor is selected because of the evidence for extensive prehistoric and historic-period activity along this portion of the Columbia River.

In the East A Corridor, both new bridge alternatives may impact the Stanley Rock Treaty Fishing Access Site on the Oregon shore, and the Evergreen Highway, the Burlington Northern Santa Fe Railway, and historic-period houses on East Steuben Street on the Washington Shore. These resources would need to be evaluated for NRHP significance and the project impacts would need to be assessed. In addition, an archaeological field survey of the Washington shore in the area between the levee road and the Burlington Northern Santa Fe Railway is recommended for either of the build alternatives in this corridor.

The relative impacts to cultural resources vary between the corridors and build alternatives proposed for the project (Table D-1). The existing Hood River Bridge, the Evergreen Highway, and the Burlington Northern Santa Fe Railway may be impacted by all of the build alternatives. In addition to these impacts, both City Center alternatives may impact the Historic Columbia River Highway, and the Tunnel alternative may also impact Fan Rock.

Archaeological site 45KL688 lies within the impact area for the new bridge alternative along the Existing Corridor. The Stanley Rock Treaty Fishing Access Site on the Oregon shore may be impacted by both of the build alternatives for the East A Corridor, while the houses on E. Steuben Street in Bingen may also be impacted by both of these build alternatives.

Despite the evidence for intensive historic-period and prehistoric activity in the general area, very limited previous field survey work has occurred within the proposed corridors and few cultural resources have been inventoried and recorded. Based on historical data reflecting intensive activity, the highest potential for undiscovered archaeological resources appears to be in the existing corridor, although archaeological deposits in this area may be largely inundated by the waters of the Bonneville reservoir.

Tribal Coordination

Four Native American tribes may have an interest in the SR-35 project: the Yakama Indian Nation, the Confederated Tribes of the Warm Springs of Oregon, the Confederated Tribes of the Umatilla Indian Reservation, and the Nez Perce of Idaho. Several actions have been taken by the Management Team to gain input and involve the tribes in decisions about the project development. These actions include:

- Project Newsletters have been sent to tribal chairpersons;
- Formal consultation letters were sent by FHWA to tribal chairpersons, cultural resource managers, and natural resource managers to initiate consultation for section 106 of the National Historic Preservation Act;
- Management Team representatives met with a WSDOT tribal coordinator at the project site to introduce the project and answer questions;
- The WSDOT tribal coordinator has submitted project materials to, and discussed the project with Yakama Indian Nation representatives; and
- An ODOT tribal coordinator is working to discuss the project with the Confederated Tribes of the Warm Springs of Oregon, the Confederated Tribes of the Umatilla Indian Reservation, and the Nez Perce of Idaho.

Objectives for involving the tribes' participation will be to obtain each tribe's input on the project, identify issues of importance that the tribes may have, and to define the area of potential effect for cultural resources. No comments have been received from any tribe during Tier II.

Critical Issues

The following summarizes environmental issues associated with each of the crossing corridors. The environmental issues that have been considered in evaluating alternatives are reflected in the environmental criteria in the summary and detailed alternatives screening tables (See Appendix F). This summary provides additional discussion concerning the environmental issues by crossing corridor.

City Center Corridor

Oregon Approach

- The approach identified in the Port of Hood River master plan would alter and would remove some area from future port development. However, positive benefits may result from providing access in the port area.
- The approach would require altering the access to the event site wind surfing parking and cruise ship dock.

Washington Approach

- Construction of the touchdown and approach would involve substantial slope impacts to provide an intersection with SR-14 and to widen SR-14 eastward toward Bingen.
- Issues related to unstable steep slopes and boulders potentially falling on railroad tracks would make construction difficult.
- The touchdown would have visual impacts due to substantial slope excavation and retaining walls needed to widen SR-14 at the intersection and to the east.

Bridge

- The bridge would negatively affect existing boardsailing and kite boarding uses from the Port of Hood River event site and near the mouth of Hood River. The bridge could affect wind patterns, and the piers and superstructure would be an obstruction for boardsailing and kite boarding.
- There could be economic effects due to actual or perceived changes in wind conditions.
- In-water construction would temporarily affect a variety of listed and resident fish species through noise, vibration and water quality impacts. A tunnel crossing option would have substantially less effect on salmonid species and resident fish than a bridge crossing.

Existing Corridor

Oregon Approach

- The approach could have right-of-way impacts on adjacent business properties. The affected properties would depend on the location upstream or downstream of the existing approach and bridge.

Washington Approach

- Probably need to remove a large oak, a large ponderosa pine tree (if upstream bridge location), and some other riparian vegetation (appears to be historically disturbed vegetation community).
- The downstream side is closer to in lieu fishing site and has a small wetland area near SR-14. Also, the downstream side has a natural gas pipeline.
- A potential archaeological site is located near intersection with SR-14. Site boundaries and eligibility have not been determined. If the site were determined to be significant (eligible for the National Register), the site would be considered a Section 4(f) resource, and would need to be avoided unless there is no prudent and feasible alternative.

Bridge

- In-water construction would temporarily affect a variety of listed and resident fish species through noise, vibration and water quality impacts.

East Corridor

Oregon Approach

- Interchange would be inconsistent with four statewide planning goals. The critical environmental issue for the East Corridor is the location of an interchange outside of the urban growth boundary (UGB) of Hood River. Four statewide planning goals would require goal exceptions before the East Corridor alternative could be advanced as a viable alternative. Exceptions would be needed for the following goals:
    - Goal 3: Agricultural Lands
    - Goal 4: Forest Lands
    - Goal 11: Public Facilities and Services
    - Goal 14: Urbanization

  Findings and analysis must be presented that demonstrate that alternatives not requiring a goal exception cannot reasonably meet the identified transportation needs.

  This issue may be considered a fatal flaw criterion if one of the other crossing alternatives can be reasonably assured of meeting the transportation needs without requiring a goal exception. Analysis to date suggests that a crossing at the existing corridor would not require a goal exception and could meet the identified transportation needs.

- An interchange would be located outside the urban exempt area under the Columbia River Gorge Management Plan.
- An interchange would likely encroach on the wetland located between I-84 and the railroad tracks, and possibly into the Columbia River. A bike and pedestrian trail connection to Hood River would also probably encroach on wetlands and/or the river because of the relatively narrow I-84 corridor.
- An interchange and connecting bike and pedestrian trail may encroach on state park land raising Section 4(f) issues. Section 4(f) prohibits use of such resources unless there is no prudent and feasible alternative.
- An interchange would be built in close proximity to cliff habitat used by peregrine falcons for nesting.

Washington Approach

- The approach would pass adjacent to Bingen Lake, which has been identified by Washington Department of Fish and Wildlife (WDFW) and others as a sensitive open water wetland used by numerous waterfowl, shorebirds, and predatory birds. The crossing adjacent to Bingen Lake would introduce light and noise, and general disturbance that may affect species using the habitat for breeding and wintering. The close presence of the crossing would also disrupt bird watching activities, according to WDFW.

- Several residential displacements may be needed on Steuben Avenue at SR-14 to accommodate a new intersection and undercrossing of the railroad tracks.
- The approach and bridge would remove some land area from future port development. However, the location would provide positive port access benefits.

Bridge

- In-water construction would temporarily affect a variety of listed and resident fish species through noise, vibration and water quality impacts. These effects would be similar for each of the crossing corridor locations.
- New piers would introduce shaded refuge locations for predator fish, such as squawfish, which prey on migrating juvenile salmonid fish. Removal of the existing bridge with its greater number of piers would offset this impact to a great extent.

Environmental Streamlining Concurrence Process

As a bi-state transportation project, the SR-35 Columbia River Crossing project invokes both the Washington NEPA/SEPA/404 Merger and the Oregon CETAS environmental streamlining processes. Both processes have formal concurrence points, or points for informal review during the NEPA project development stages:

- Purpose and Need Statement and Role of All Agencies
- Criteria for Alternatives Selection
- Alternatives to be Evaluated in the Draft Environmental Impact Statement (DEIS)
- Preliminary Preferred Alternative (if known)
- Final Environmental Impact Statement (FEIS)
- Preferred Alternative
- Detailed Mitigation Plan

Concurrence on the first two points has been requested for this project during Tier II. Copies of the Purpose and Need Statement and Criteria for Alternatives Selection that were submitted for concurrence are provided in Attachment D-1 and D-2. Attachment D-3 summarizes the responses that were received from the agencies and includes the Management Team's responses to these comments.

The ODOT staff that coordinates the Oregon CETAS process is working with agencies that have not responded to concurrence requests. ODOT plans to formally close the extended comment period and waive the non-responding agencies' participation in the CETAS process for any projects that have not actively commented. Thus, several agencies may not participate in future SR-35 project concurrence requests unless they request to re-enter this project's concurrence process.

As the SR-35 project transitions into Tier III, the Management Team will need to confer with ODOT CETAS and WSDOT Merger representatives to determine how comments should be incorporated into the Purpose and Need/Role of All Agencies and Criteria for Alternatives Selection. The next concurrence point, Alternatives to be Evaluated in the DEIS, will need to be developed and taken to Oregon CETAS and Washington Merger committees for concurrence.

References

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Attachment D-1

PURPOSE AND NEED STATEMENT

Purpose Statement

The purpose of this project is to improve multi-modal transportation of people and goods across the Columbia River between the Bingen / White Salmon, Washington and Hood River, Oregon communities.

Need for Project

The overall need for the State Route 35 (SR-35) Columbia Crossing project is to rectify current and future transportation inadequacies and deficiencies associated with the existing Hood River Bridge. Specific needs are addressed as follows.

Capacity

Local Hood River Bridge users are dissatisfied with traffic congestion on the bridge as well as congestion on the bridge approaches. Traffic on the existing bridge has increased approximately 350 percent since 1970, a growth rate of approximately 4.5 percent per year. These operational issues have prompted the need to address levels of service (LOS) associated with the existing bridge, approach roads, and major highway connections.

High levels of traffic occur at the East Hood River Interstate 84 (I-84) interchange where Oregon 35 (OR-35) / Hood River Bridge access roadway intersects with two off-ramps from I-84 and at the Button Junction / State Street / OR-35 intersection. Moderate levels of congestion (LOS D/E and LOS C respectively) are associated with these intersections. Seasonal traffic associated with peak windsurfing activities and poor weather conditions that divert traffic from I-84, State Route 14 (SR-14), US Highway 26 (US 26), or OR-35 can deteriorate congestion to an F level-of-service.

The preferred alternative must satisfy capacity needs and meet Washington State and Oregon Departments of Transportation standards regarding traffic operations and queuing and meet at least a Level-of-Service D standard for current and projected traffic, to:

- Alleviate congestion at major highway connections;
- Alleviate congestion associated with the bridge and bridge access intersections; and
- Alleviate seasonal congestion associated with peak windsurfing activities, winter recreation, and diverted traffic during poor weather conditions.

System Linkage

The existing crossing is an important system linkage between the Oregon and Washington state highway systems as well as provides a connection to the interstate system. The preferred alternative must maintain a system linkage to:

- Provide a cross-river connection between Bingen / White Salmon, Washington and Hood River, Oregon to I-84 and SR-14 via a new SR-35 corridor or the current bridge.

Transportation Demand

Projected traffic for the Year 2020 indicates an increase in cross-river transportation demand of 50 to 70 percent over the existing conditions. In conjunction with providing transportation infrastructure that meets capacity and roadway and bridge deficiencies, the preferred alternative must also:

- Accommodate cross-river transportation demand while not increasing per capita vehicle miles traveled as required by the Oregon Transportation Planning Rule; and
- Accommodate pedestrian and bicycle demand while minimizing out-of-direction travel that would substantially increase the average trip length for these modes.

Legislation

The Washington congressional delegation, with support from the Oregon congressional delegation, responded to local constituents' concerns about the functionality of the existing bridge and obtained federal funding for this high priority project as part of the Transportation Equity Act for the 21st Century (TEA-21) federal transportation-financing bill. The Washington State legislature has recognized the potential for a new Columbia River crossing and has designated an SR-35 corridor that connects from SR-14 to the Columbia River but does not specify the exact crossing location. The crossing location and facility type(s) are to be determined through alternative development and selection of a preferred alternative.

The preferred alternative must satisfy legislative needs to:

- Comply with TEA-21 programmed high priority project funding for a feasibility study to replace or improve the Columbia River Crossing along the proposed SR-35 corridor; and
- Comply with the SR-35 corridor designation by the Washington State legislature.

Social Demands and Economic Development

Economic growth and development of the local communities is tied to adequate transportation infrastructure between the two Washington cities and Hood River, Oregon and connecting the nearby Oregon and Washington major highways (SR-14 and I-84). Due to narrow lanes and a bridge load limitation, the existing bridge restricts the flow of goods and does not accommodate larger vehicles. Commuters and consumers are dissatisfied with the congestion and perceived safety hazards of the existing bridge.

Local and regional economic growth and development that is dependent on adequate transportation infrastructure would be enhanced by diversifying and expanding the use of this crossing rather than diverting prohibited traffic or dissatisfied users to other crossings approximately 20 miles east and west of the Hood River Bridge.

Many users of the existing bridge are demanding that funding for long-term operation and maintenance of a new or improved crossing be considered.

The preferred alternative must satisfy social demands and economic needs to:

- Provide transportation infrastructure for the current and projected flow of goods, labor and consumers across the Columbia River between White Salmon / Bingen and Hood River; and
- Develop financially acceptable funding strategies for long-term operation and maintenance of a new or improved crossing.

Modal Interrelationships

The substandard width of the current crossing constrains the mobility of cross-river truck traffic and prevents cross-river bicycle and pedestrian traffic. The impact on truck mobility affects the movement of goods (most notably perishable goods) from local ports to local and non-local markets. The lack of bicycle and pedestrian facilities severely limits the mobility of those who do not own nor have access to vehicles for cross-river trips. The ability to reduce per capita vehicle miles traveled through encouragement of alternative modes is restricted without appropriate facilities.

The navigation channel under the bridge has a horizontal clearance of 246 feet, which is less than the 300-foot wide navigation channel. Moreover, the current channel is not effectively aligned with westerly winds. Barges utilizing the Columbia River navigation channel typically measure 42 feet with doublewides at 84 feet. While barge lengths vary between 150 feet and 300 feet, lock sizes limit tow configurations to a total length of 650 feet. During significant winds, barges have to tack through the bridge with the winds pushing the barges sideways. This difficulty is compounded with the bridge opening being narrower than the navigation channel. Although these navigation factors are less than optimal, the existing bridge accommodates river traffic use without recording any accidents that resulted in severe damage or loss of life. Nearby bridges are better suited for navigation with wider clearances. The Bridge of the Gods at Cascade Locks and The Dalles California Highway Bridge at The Dalles are fixed span bridges (i.e., no lift spans) with horizontal clearances of 655 feet and 551 feet, respectively. However, the Interstate 5 Columbia River crossing, which has a 263-foot horizontal clearance, provides similar difficulties to river traffic as does the Hood River Bridge.

The preferred alternative must satisfy modal interrelationship needs to:

- Accommodate river navigation by providing a horizontal clearance that meets current standards if any new facility is constructed; and
- Provide adequate facilities for passenger and commercial vehicles, mass transit services, bicycles, and pedestrians.

Safety

The deficiencies of narrow lanes on the existing Hood River Bridge create vehicle driver perception of poor safety although the incidence of accidents is not high. The narrow lanes result in frequent reports of “mirror-to-mirror” collisions between wide vehicles using the bridge at the same time. These safety concerns as well as current bridge geometrics dictate that the speed limit be restricted to 25 mph.

The lack of bicycle and pedestrian facilities provides hazardous conditions for those who bicycle on the bridge and has resulted in a prohibition of pedestrian travel on the bridge. The bridge grating provides a hazardous driving surface for motorcycles.

The substandard horizontal clearance for navigation under the current bridge has contributed to minor collisions of river vessels with the bridge. Over the past seven years, the Port of Hood River recalled that two or three barges have scraped through the bridge opening but not caused any significant damage. Reports of near misses with the bridge are prevalent among river vessel pilots. However, no major collisions have been reported to the U.S. Coast Guard.

The preferred alternative must satisfy safety needs to:

- Reduce real and perceived safety hazards associated with the narrow travel lanes;
- Provide safe travel for bicycles and pedestrians;
- Provide safe travel surfaces for motorcycles; and
- Reduce hazards associated with a substandard navigation channel clearance if any new facility is constructed.

Roadway and Bridge Deficiencies

The existing bridge and bridge roadway are functionally obsolete or deficient in terms of narrow travel lanes, lack of pedestrian and bicycle facilities, low load carrying capacity, audible noise associated with the bridge deck, and vulnerability to a seismic event.

Each of the two travel lanes is 9.5 feet wide, which hinders large vehicle traffic and creates a perception of hazardous travel conditions for many users. The bridge does not have facilities for bicycle traffic, which discourages bicycle travel. Additionally, the lack of pedestrian facilities has resulted in a prohibition of pedestrians on the bridge. For a two-lane bridge, American Association of State Highway and Transportation Officials (AASHTO) guidelines recommend a preferred minimum width of 28-30 feet to accommodate travel lanes, as well as a shared bicycle / pedestrian facility at a minimum.

Several bridge inspections have been completed for the Port of Hood River on the existing bridge. Current structural conditions, however, are not clearly known due to the timing and specific focus of the previous inspections. Federally funded programs that involve improvements to the existing bridge will likely require an updated bridge inspection. Structural deficiencies identified in a future bridge inspection may need to be addressed in making improvements to the existing bridge.

Noise generated by traffic crossing the existing bridge deck is clearly audible within and outside the immediate vicinity of the bridge. In addition, the existing bridge has not been updated to meet current seismic standards.

The preferred alternative must satisfy roadway and bridge deficiency needs to:

- Increase motorized vehicle travel lane widths to at least 12 feet;
- Provide facilities for pedestrian and bicycle use;
- Reduce noise created by motorized vehicles traveling on the existing bridge deck; and
- Meet current seismic design standards.

Other Objectives

In addition to meeting the purpose of and needs for the project as stated above, the proposed action would attempt to achieve the following objectives:

- Improve cross-river multi-modal transportation of people and goods;
- Meet current standards for river navigation if any new facility is constructed;
- Avoid, minimize, or compensate for impacts to the natural, built, and aesthetic environment;
- Avoid, minimize, or compensate for impacts to recreational users and facilities;
- Be financially acceptable and support local economic development;
- Avoid, minimize, or compensate for impacts on cultural and historical resources; and
- Maintain the integrity of the interstate highway system.

Project History

The Columbia River bridge crossing, which connects White Salmon and Bingen, Washington and Hood River, Oregon (referred to locally as the Hood River Bridge) was built in 1924. A lift span was added to the bridge in 1938 to respond to raised water elevations in the pool behind Bonneville Dam. The bridge is a steel structure with a narrow roadway deck width of approximately 18 feet 9 inches and has no separated pedestrian or bicycle facilities.

The Washington congressional delegation, with support from the Oregon congressional delegation, responded to local constituents' concerns about the functionality of the existing bridge and obtained federal funding for this high priority project as part of the Transportation Equity Act for the 21st Century (TEA-21) federal transportation-financing bill. The Washington State legislature has recognized the potential for a new Columbia River crossing and has designated an SR-35 corridor that connects from SR-14 to the Columbia River but did not specify the exact crossing location. The crossing location and facility type(s) are to be determined through alternative development and selection of a preferred alternative.

The project area comprises the Columbia River and areas landward that connect White Salmon and Bingen, Washington to Hood River, Oregon. The northern end of the Hood River Bridge touches down on the southwestern edge of White Salmon. Bingen is located approximately one mile east of White Salmon. Both cities are in Klickitat County. Skamania County, Washington lies nearby to the west and is also included in the project area due to a range of alternatives being considered. The major east / west highway on the Washington side of the Columbia River is SR-14, a National Highway System route, which traverses both Washington cities.

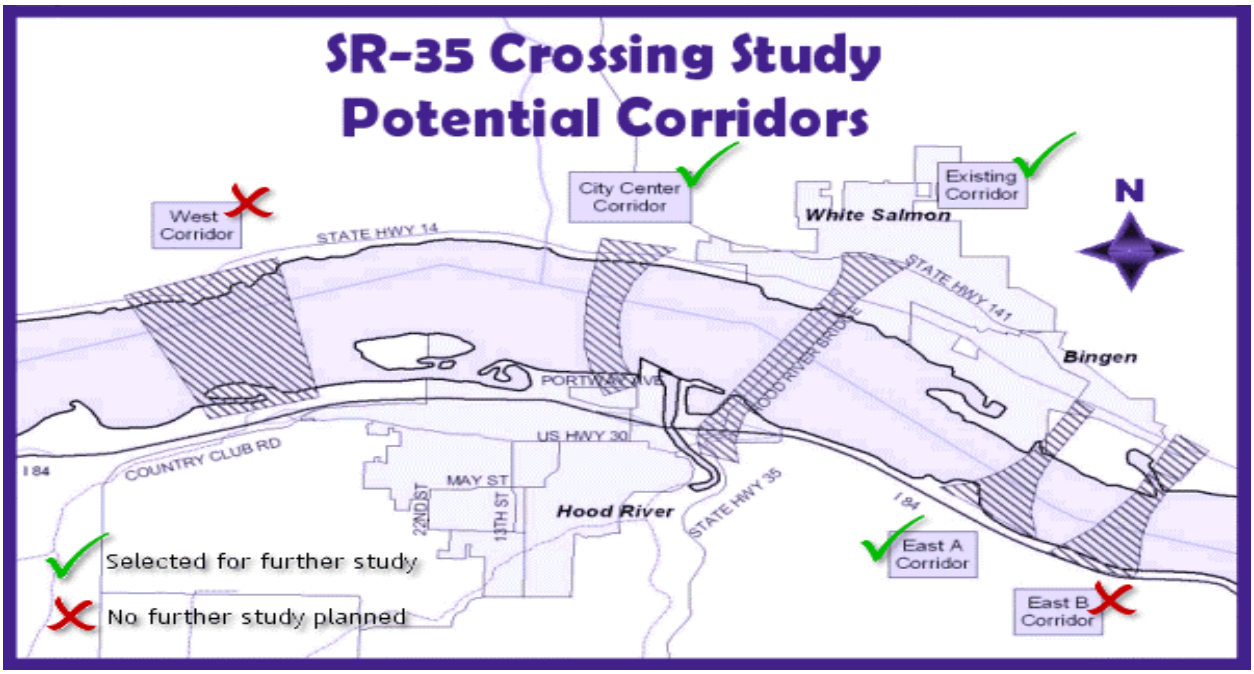
The southern end of the Hood River Bridge touches down in Hood River, Oregon (Hood River County). I-84 is the major east / west highway on the Oregon side of the Columbia River; it connects Portland, Oregon to points east, such as Pendleton, Oregon and Boise, Idaho. Another major highway in the Hood River vicinity is OR-35, which connects to US 26 (Mount Hood Highway) approximately 40 miles to the south.

Attachment D-2

CRITERIA FOR ALTERNATIVES SELECTION

BACKGROUND

The project team is developing approximately 17 action alternatives within three corridors (see vicinity map) for a new or improved crossing of the Columbia River near Hood River, Oregon and White Salmon, Washington. These alternatives may include crossing facilities such as a new fixed span, movable or floating bridge; a new tunnel; and intelligent transportation system and retrofit options for the existing bridge. New facilities are being considered with and without the use of the existing bridge for pedestrian and bicycle transportation. A No Action alternative will be considered throughout project development. The criteria listed below will be used during the selection of alternatives to be carried into the draft EIS.



MEASURES

The following quantitative measures will be applied when data is available. In other cases, qualitative measures based on an impact index will be applied, as follows:

High impact: A high level of adverse impacts is likely and mitigation measures to offset the impacts would be extensive, only partially effective, or very expensive.

Moderate impact: A moderate level of adverse impacts is likely and mitigation measures would be feasible or practical with a moderate level of expense.

Low impact: There is a low potential for adverse impacts and little or no mitigation may be necessary.

The evaluation criteria correspond to the seven objectives contained in the purpose and need statement. The criteria are categorized by project objectives and indicate the type of measure to be applied during the alternatives selection process.

CRITERIA

Objectives:

- Improve cross-river multi-modal transportation of people and goods
- Meet acceptable clearances for river navigation if any new facility is constructed

Criteria	Measure
Vehicle miles traveled (VMT)	Vehicle-miles in the study area
Travel time and delay	Vehicle-hours in the study area
Compliance with roadway geometric standards	Yes or No
Compliance with navigation channel guidelines	Yes or No
Ability to handle peak traffic episodes	Impact Index based on route levels-of-service, routes through city centers and capacity
Commercial goods mobility	Impact Index based on proximity to truck routes, proximity to truck trip generators, lane widths, VMT, routes through city centers and river navigation
Bicycle and pedestrian mobility (recreation and commuting purposes)	Impact Index based on proximity to recreation areas, bike routes, city centers and pedestrian trip generators

Objective:

- Avoid, minimize or compensate for impacts to the natural, built and aesthetic environment

Criteria	Measure
Federally listed threatened and endangered fish species and habitat	Impact Index based on the number of species that are known to or potentially occur, presence of designated critical habitat and extent of impacts to species and habitat

Criteria	Measure
Federally listed threatened and endangered wildlife and plant species and habitat	Impact Index based on the number of species that are known to or potentially occur, presence of designated critical habitat and extent of impacts to species and habitat
Other fish, wildlife and plant species and habitat, including state listed species	Impact Index based on the number of species that are known to or potentially occur and extent of impacts to species and habitat
Visual resources	Impact Index based on location, duration of view, distance of view, potential visual design factors and vegetation disturbance; consistency with Columbia River Gorge National Scenic Area Management Plan guidelines
Land use plan consistency	Impact Index based on existing, permitted, conditional and prohibited uses or on exceptions to plans that would need special approvals
Geology	Impact Index based on type and extent of impact to unstable slopes or other soils
Wetlands	Impact Index based on estimated area and quality of wetlands impacted
Environmental justice consistency	Yes, if the affected area minority and low-income populations are less than or equal to state populations (i.e., disproportionate impacts may occur); or No, if the affected area minority and low-income populations are greater than state populations (i.e., no disproportionate impacts would be likely)
Hydrology	Impact Index based on changes to water flow patterns

Objective:

- Avoid, minimize or compensate for impacts to recreational users and facilities

Criteria	Measure
Water-based recreation	Impact Index based on type, level, significance and uniqueness of use of the affected area and on access points to the river

Criteria	Measure
Land-based recreation	Impact Index based on type, level, significance and uniqueness of use of the affected area
Park lands and public recreation areas	Acres of parks or public recreation areas in the affected area; level of direct and indirect impacts

Objective:

- Avoid, minimize or compensate for impacts on cultural and historical resources

Criteria	Measure
Archaeological resources	Number of sites in area of potential effect and significance
Historic resources	Number of sites in area of potential effect and significance
In lieu fishing sites (Native American Treaty Fishing Access sites)	Number of sites in area of potential effect and significance

Objective:

- Be financially acceptable and support local economic development

Criteria	Measure
Construction cost (excludes mitigation and right-of-way costs)	Relative order of magnitude cost
Operating/maintenance costs	Relative order of magnitude cost
Impacts to business and the local economy	Impact Index based on lost, reduced or changed economic activity in the affected area
Consistency with local economic development plans and policies	Impact Index based on plans and policies regarding economic development, including comprehensive plan designations and zoning, master plans and other comprehensive planning policies
Impacts to economic development	Impact Index based on undesirable barriers or inducements to future economic development
Construction economic impacts	Impact Index based on new jobs, revenue and economic activity from construction dollars
Home/business displacements or relocations	Impact Index based on relative order of magnitude number of homes or businesses displaced or relocated

Objective:

- Maintain the integrity of the Interstate highway system

Criteria	Measure
Interchange level-of-service	Level-of-service (LOS) rating
Ramp queuing	Impact Index based on LOS and projected demand
Safety – accident reduction	Impact Index based on I-84 mainline operations, including weaving and accidents due to merging or exiting traffic

Attachment D-3

Attachment D-3. Concurrence Process Comments and Responses

Washington Merger SAC

Concurrence on Purpose and Need and the Role of All Agencies was requested; responses were due on August 15, 2001. Concurrence on Criteria for Alternatives Selection was requested; responses were due on January 25, 2002. The following is a summary of responses that were received and action items that are recommended.

Agency	Purpose and Need		Criteria for Alternatives Selection		SR-35 MT Response
	Response	Explanation of Response, if provided	Response	Explanation of Response, if provided	
Corps (Seattle District)	Declined to participate	COE will not review project under the Merger agreement process.	N/A	N/A	None required
EPA	Concurrence with comments	N/A	Concurrence with comments		• Coordinate with EPA on how the P&N should be reorganized • Add a new criteria "Indirect and Cumulative Effects"
FHWA	Concurrence (verbal)	Project proponent	N/A	Project proponent	None required
NMFS	Concurrence with comments	N/A	None yet		• Guidance was provided for developing criteria and alternatives. This will be incorporated into the next concurrence points. • NFMS will likely waive concurrence on Criteria.
USFWS	Concurrence as presented	N/A	Concurrence with comments		• Consider mitigation and right-of-way costs in criteria on financial acceptability
WDFW (WA Dept of Fish and Wildlife)	Concurrence with comments	N/A	Concurrence with comments		• Clarify mitigation sequencing in the P&N • Modify ROA to include references to wildlife consultations and non-commercial fish species • Review concern about the East A corridor • Clarify that NEPA document will be requested for adoption by SEPA • Address noise and glare in Criteria "Avoid, minimize or compensate for impacts to the natural, built and aesthetic environment"
WDOE (WA Dept of Ecology)	Concurrence	N/A	Concurrence with comments		• Reword geology & EJ criteria; add water quality and floodplain criteria; reorganize financial feasibility—or justify why comments were not incorporated.
WSDOT	N/A	Project proponent	N/A	Project proponent	None required

Oregon CETAS

Concurrence on Purpose and Need was requested; responses were due on July 30, 2001. Concurrence on Criteria for Alternatives Selection was requested; responses were due on January 14, 2002. The following is a summary of responses that were received and action items that are recommended.

Agency	Purpose and Need		Criteria for Alternatives Selection		SR-35 MT Response
	Response	Explanation (if provided)	Response	Explanation (if provided)	
Corps (Portland District)	Concur	N/A	Concur	N/A	None required
EPA	Comments only	Defers to WA EPA	Comments only	Defers to WA EPA	None required
FHWA	Concur	Defers to WA FHWA	Concur	Defers to WA FHWA	None required
NMFS	Concur	N/A	Concur with comments		• Needs further information on the qualitative and quantitative measures used for all criteria
USFWS	Non-concur	N/A	None yet		• Agency requests that specific wording on the protection of fish and wildlife and their habitats, including species listed under the ESA, be included in the P&N statement as one of the environmental objectives. • Revise the P&N statement after other concur/non-concurs are received from remaining agencies. • Resubmit for concurrence when all agencies have responded, if ODOT requires • ODOT will follow up on receiving comments to Criteria and resolving the non-concur to P&N
ODFW (OR Dept of Fish and Wildlife)	Concur	N/A	Concur		None required
DEQ (OR Dept of Environmental Quality)	Concur	N/A	Concur	N/A	None required
DLCD (OR Dept of Land Conservation and Development)	Concur with comments	N/A	None yet		• Review alternatives that are outside the Hood River UGB. These alternatives would require exceptions to four Statewide Planning Goals. For Hood River County to approve these goal exceptions, need to justify that there are no reasonable alternatives that can be used within the UGB. • ODOT will follow up on receiving comments to Criteria

Agency	Purpose and Need		Criteria for Alternatives Selection		SR-35 MT Response
	Response	Explanation (if provided)	Response	Explanation (if provided)	
DSL (OR Division of State Lands)	No response expected	No staff resources to participate in concurrence process; will answer any specific questions project direct specifically to DSL.	None yet		• ODOT will follow up on receiving comments to Criteria
ODOT	N/A	Project proponent	N/A	Project proponent	None required
SHPO	N/A	Not a CETAS member at the time of P&N concurrence request.	Concur	N/A	None required

Notes:

- No changes to the Purpose and Need Statement have been made to date. To respond to several agencies' comments, changes to this statement may need to be made prior to its inclusion in the DEIS.
- In addition to modifying the Criteria for Alternatives Selection in response to comments received from agencies, several criteria were also slightly reorganized and merged to avoid "double-scoring" impacts. The revised Criteria for Alternatives Selection were applied to the Tier II second screening of alternatives to recommend alternatives to carry forward into the DEIS.

Appendix E – Transportation Analysis

Table of Contents

Tables

SR-35 Tier II Technical Memorandum
Transportation Analysis

Background

During Tier I of the Columbia River Crossing study, 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, the corridors were developed into alternatives, with specific locations identified. More detailed transportation information was developed to assist in the evaluation of these alternatives. Transportation considerations at the alternative-level screening can be assessed with 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 Interstate (I-84) and National Highway System (SR-14) facilities.

Six "build" alternatives were carried forward into Tier II and these are evaluated in this memorandum.

Forecasts

Two separate forecasts were developed for Tier II:

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

During Tier I, using the 1991 Hood River Bridge Origin-Destination (O-D) Study (Intergovernmental Resource Center, 1991), trip tables for cross-river trips were developed for the year 2025. Origins and destinations were generally city limits or subareas identified in the O-D Study and were considered as traffic zones for this analysis. Cross-river trips were assigned to the roadway network based on the corridor location and the origin and destination traffic zone.

Vehicle Miles Traveled (VMT)

Vehicle miles traveled were calculated by multiplying each trip's length by the number of trips between traffic zones. For Tier II, the forecasts were updated to the Year 2025 and were based on a composite of the forecast Klickitat and Hood River County growth rates (an average of 1.3 percent per year) and the past 20-year Hood River Bridge traffic trends (an average of 3.9 percent per year). An average three percent annual bridge traffic growth rate resulted and was used for the evaluation, which resulted in a Year 2025 average daily traffic on the crossing of 16,200 vehicles, compared to 7,700

under existing conditions. An adjustment was made for the tunnel option on the City Center corridor, where additional travel distance is necessary due to the tunnel's profile and the transition from underwater to surface distance.

- High Conflict is a Year 2025 VMT that is 30 percent or higher than the VMT for the current bridge crossing.
- Moderate Conflict is a Year 2025 VMT between 11 and 30 percent higher than the VMT for the current bridge crossing.
- Low Conflict is a Year 2025 VMT within 10 percent of the VMT for the current bridge crossing.

The Year 2025 VMT table (daily trips) and resultant conflict levels for alternatives by corridor is shown in Table 1.

Table 1. Vehicle Miles Traveled Summary

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

Level of Service and Intersection/Toll Booth Queuing

Using Year 2025 forecasts factored to an AM and PM peak hour, level-of-service using Highway Capacity Manual techniques were developed for key intersections in the various alternatives. A traffic simulation model using Synchro/SimTraffic (Version 5, Trafficware Corporation, 2001) was used to examine impacts of queuing on I-84 and intersections along the crossing alternative. Table 2 summarizes the levels-of-service and queuing at key locations under the various alternatives.

Table 2. Level-of-Service and Queuing Summary

Alternative	I-84 Ramps	SR-14 Intersection	Toll Booth
City Center – bridge	*LOS C/D, some queuing but not onto I-84 mainline*	*LOS C/D*	*Moderate queuing*
City Center – tunnel	*LOS C/D, some queuing but not onto I-84 mainline*	*LOS C/D*	*Moderate queuing*
Existing – fixed span	*LOS C/D, some queuing but not onto I-84 mainline*	*LOS C/D*	*Moderate queuing, potential for spillback into the four-way stop at the Port/retail entrance**
Existing – retrofit	*LOS C/D, some queuing but not onto I-84 mainline*	*LOS C/D*	*Moderate queuing, potential for spillback into the four-way stop at the Port/retail entrance**
East – both fixed span alternatives	*LOS B*	*LOS B*	*Moderate queuing*
No Action	*LOS F, with queuing extending onto the I-84 mainline in both directions*	*LOS C/D*	*Potentially significant, with queues extending through the adjacent four-way stop at the Port/retail entrance**

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

Bicycle and Pedestrian

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

- High Conflict occurs if bicycle and pedestrian Year 2025 VMT is 30 percent or higher than the VMT for the current bridge crossing; if grades at crossing endpoints are steep; if bicycle and pedestrian facilities would be impractical to build; or, if there are no existing or planned facilities which would connect the alternative to Hood River or Bingen city centers.
- Moderate Conflict occurs if bicycle and pedestrian Year 2025 VMT is between 11 and 30 percent higher than the VMT for the current bridge crossing; if grades at crossing endpoints are moderate; or, if a connection to the Hood River or Bingen city centers is available but is via a shoulder along a high-speed roadway facility.

- Low Conflict occurs if bicycle and pedestrian Year 2025 VMT is within 10 percent of the VMT for the current bridge crossing and grades are relatively easy to travel, or if there are current or planned bicycle/pedestrian facilities which would connect the alternative to the Hood River or Bingen city centers with a separated facility.

Table 3 summarizes the bicycle and pedestrian evaluation.

Table 3. Bicycle and Pedestrian Evaluation Summary

Alternative	Bike/Ped Commute	Bike/Ped Other	Proximity to Existing and Planned Facilities
City Center – bridge	Vehicle VMT is 20% higher than Existing corridor, increasing the distance bicycles will need to travel across the river.	Proximity to recreational destinations (windsurfing sites) and Hood River city center may actually shorten some bike trips compared to Existing Corridor.	There are no existing nor programmed bike/ped facilities on SR-14 from the City Center touchdown point at SR-14 east to the Hood River Bridge intersection. Shoulders on SR-14 are currently narrow and somewhat hazardous for bikes and pedestrians.
City Center – tunnel	Bicycles and pedestrians would use the existing bridge, which has shorter travel distances compared to vehicles using the tunnel.	About the same travel distances as existing corridor.	Connects on the Washington side to the programmed SR-14 bike/pedestrian path. Connects near Hood River city center on the Oregon side, and a path that crosses Hood River adjacent to I-84 to access Port of Hood River and city center.
Existing – fixed span	Vehicle VMT in the Existing Corridor is the lowest of any alternatives, minimizing the distance bicycles will need to travel across the river.	This is located approximately equidistant from Washington and Oregon recreational destinations compared to City Center or East Corridors. Shorter access to Bingen and White Salmon compared to City Center corridor, and shorter access to Hood River compared to East corridor.	Connects on the Washington side to the programmed SR-14 bike/pedestrian path. Connects near Hood River city center on the Oregon side, and a path that crosses Hood River adjacent to I-84 to access Port of Hood River and city center.
Existing – retrofit	Vehicle VMT in the Existing Corridor is the lowest of any alternatives, minimizing the distance bicycles will need to travel across the river.	This is located approximately equidistant from Washington and Oregon recreational destinations compared to City Center or East Corridors. Shorter access to Bingen and White Salmon compared to City Center corridor, and shorter access to Hood River compared to East corridor.	Connects on the Washington side to the programmed SR-14 bike/pedestrian path. Connects near Hood River city center on the Oregon side, and a path that crosses Hood River adjacent to I-84 to access Port of Hood River and city center.
East – fixed span with existing bridge for bikes/peds	Vehicle VMT in the Existing Corridor is the lowest of any alternatives, minimizing the distance bicycles will need to travel across the river.	This is located approximately equidistant from Washington and Oregon recreational destinations compared to City Center or East Corridors. Shorter access to Bingen and White Salmon compared to City Center corridor, and shorter access to Hood River compared to East corridor.	Connects on the Washington side to the programmed SR-14 bike/pedestrian path. Connects near Hood River city center on the Oregon side, and a path that crosses Hood River adjacent to I-84 to access Port of Hood River and city center.
East – fixed span for all modes	Vehicle VMT is 25% higher than Existing corridor, increasing the distance bicycles will need to travel across the river. For bicycles, this increased distance is more significant compared to trips being made in vehicles.	Although it has good proximity to Bingen Pond and Koberg State Park, travel distances to non-work and other recreational destinations are higher than alternatives in other corridors.	Connects on the Washington side to central Bingen with relatively good access to SR-140 and White Salmon. Will need to have a shoulder widening along I-84 on the Oregon side to provide bike/ped. access to the state park and to Hood River.
No Action	No provision is made for a bike/pedestrian facility on the river crossing, which is a high negative impact.	No provision is made for a bike/pedestrian facility on the river crossing, which is a high negative impact.	No provision is made for a bike/pedestrian facility on the river crossing. Connects on the Washington side to the programmed SR-14 bike/pedestrian path. Connects near Hood River city center on the Oregon side, and a path that crosses Hood River adjacent to I-84 to access Port of Hood River and city center.

Commercial Goods Mobility

This is a composite measure using the VMT table (Table 1) shown above (assuming it would also apply to cross-river freight and goods trips), relative grades at the crossing endpoints (to get onto and off of the crossing), and proximity to commercial/freight origins and destinations (such as commercial/retail centers, employment centers, and port facilities). Also, commercial goods mobility is based on the lane widths of facilities supporting large loads.

- High Conflict occurs if commercial Year 2025 VMT is 30 percent or higher than the VMT for the current bridge crossing; if grades at crossing endpoints are steep; or if facilities cannot support large loads.
- Moderate Conflict occurs if commercial Year 2025 VMT is between 11 and 30 percent higher than the VMT for the current bridge crossing; if grades at crossing endpoints are moderate; or if facilities have substandard conditions for large load transport.
- Low Conflict occurs if commercial Year 2025 VMT is within 10 percent of the VMT for the current bridge crossing; grades are relatively easy to travel; or facilities readily accommodate large load transport.

Accidents and Safety

A Tier I baseline conditions inventory indicated that there were no identified high accident locations in the study area. Therefore, safety under this evaluation is more of a risk assessment and accident predictive analysis. Risk is based on the potential to increase the accident rate, using such factors as the number and frequency of traffic stopping, ramp queues, and freeway weaving between interchanges.

Generally, accidents and safety were evaluated on the following basis:

- High conflict occurs if Year 2025 peak period traffic queues are expected to extend onto the I-84 mainline, or if traffic queues are projected to extend (spill back) through adjacent intersections.
- Medium conflict occurs if Year 2025 peak period traffic queues under average traffic conditions are not expected to extend onto the I-84 mainline, but under certain peak traffic conditions there is a high likelihood that queues could extend onto the mainline or through adjacent intersections.
- Low conflict occurs if Year 2025 peak period traffic queues are not expected to extend onto the I-84 mainline or through adjacent intersections, even under peak traffic episodes.

Table 4 summarizes the safety and accident analysis for each of the alternatives.

Table 4. Accident and Safety Evaluation Summary

Alternative	Ramp Queuing	Safety/Accident Reduction
City Center – bridge	Existing traffic signals and ramp configurations should be adequate to store ramp queues without extending onto the I-84 mainline. Traffic growth in Hood River city center may result in longer queues than in other locations.	Ramp queues should not extend onto the I-84 mainline. There may be a higher level of weaving between the City Center and Oregon 35 interchanges under this alternative, creating a slightly higher potential for accidents on I-84.
City Center – tunnel	Providing traffic signals or roundabouts at the I-84 ramps, along with improvements at the four-way stop at the retail/Port intersection and toll booth operational improvement, should alleviate the potential for ramp queues to extend onto the I-84 mainline.	Ramp queues should not extend onto the I-84 mainline, with signalized (or roundabout) ramp termini. There may be a higher level of weaving between the City Center and Oregon 35 interchanges under this alternative, creating a slightly higher potential for accidents on I-84.
Existing – fixed span	Providing traffic signals or roundabouts at the I-84 ramps, along with improvements at the four-way stop at the retail/Port intersection and toll booth operational improvement, should alleviate the potential for ramp queues to extend onto the I-84 mainline.	Ramp queues should not extend onto the I-84 mainline, with signalized (or roundabout) ramp termini. There may be a higher level of weaving between the City Center and Oregon 35 interchanges under this alternative, creating a slightly higher potential for accidents on I-84.
Existing – retrofit	With interchange operating at LOS B, ramp queuing should not be an issue.	Ramp queues should not extend onto the I-84 mainline. There may be a higher level of weaving between this interchange and the Oregon 35 interchanges under this alternative, creating a slightly higher potential for accidents on I-84.
East – fixed span with existing bridge for bikes/peds	With interchange operating at LOS B, ramp queuing should not be an issue.	Ramp queues should not extend onto the I-84 mainline. There may be a higher level of weaving between this interchange and the Oregon 35 interchanges under this alternative, creating a slightly higher potential for accidents on I-84.
East – fixed span for all modes	With interchange operating at LOS B, ramp queuing should not be an issue.	Ramp queues should not extend onto the I-84 mainline. There may be a higher level of weaving between this interchange and the Oregon 35 interchanges under this alternative, creating a slightly higher potential for accidents on I-84.
No Action	Without signals or other additional traffic control at the I-84 ramps, ramp intersections are projected to operate at LOS F and ramp queues are projected to extend well onto the I-84 mainline.	Without signals or other additional traffic control at the I-84 ramps, ramp intersections are projected to operate at LOS F and ramp queues are projected to extend well onto the I-84 mainline, carrying with it significant increased accident potential.

Interstate and National Highway System Impacts

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

- High conflict occurs when cross-river VMT on I-84 and/or SR-14 is expected to be significantly higher compared to the No-Build alternative, or when ramp queues are expected to extend onto the I-84 mainline in Year 2025 peak periods
- Medium conflict occurs when cross-river VMT on I-84 and/or SR-14 is expected to be moderately higher compared to the No-Build alternative, or when ramp queues are expected to extend onto the I-84 mainline in Year 2025 during peak traffic episodes
- Low conflict occurs when cross-river VMT on I-84 and/or SR-14 is not expected to be significantly higher compared to the No-Build alternative, or when ramp queues are not expected to extend onto the I-84 mainline in Year 2025 under any peak traffic episodes.

Table 5 summarizes the Interstate and NHS impacts for each alternative.

Table 5. Interstate and National Highway System Impacts Evaluation Summary

Alternative	Ramp Queuing	VMT on Interstate or NHS Route
City Center – bridge	Existing traffic signals and ramp configurations should be adequate to store ramp queues without extending onto the I-84 mainline.	VMT on SR-14 is increased as trips on the Washington side, primarily destined for White Salmon or Bingen, must travel further on SR-14 to reach their destination compared to the Existing Corridor.
City Center – tunnel	Providing traffic signals or roundabouts at the I-84 ramps, along with improvements at the four-way stop at the retail/Port intersection and toll booth operational improvement, should alleviate the potential for ramp queues to extend onto the I-84 mainline.	As much of the cross-river traffic is between Hood River and White Salmon/Bingen, this option allows those trips to enter Hood River without having to use I-84. On the Washington side, the connection to SR-14 is at the existing bridge location, which minimizes the VMT on SR-14 to get to White Salmon or Bingen.
Existing – fixed span	Providing traffic signals or roundabouts at the I-84 ramps, along with improvements at the four-way stop at the retail/Port intersection and toll booth operational improvement, should alleviate the potential for ramp queues to extend onto the I-84 mainline.	VMT on I-84 is higher compared to the City Center alternative as cross-river traffic will likely use I-84 to get to Hood River City Center. VMT on SR-14 is lower than for City Center fixed span bridge alternative.
Existing – retrofit	With interchange operating at LOS B, ramp queuing should not be an issue.	VMT on I-84 is higher compared to the City Center alternative as cross-river traffic will likely use I-84 to get to Hood River City Center. VMT on SR-14 is lower than for City Center fixed span bridge alternative.
East – fixed span with existing bridge for bikes/peds	With interchange operating at LOS B, ramp queuing should not be an issue.	VMT on I-84 is higher compared to the City Center or Existing Corridor alternatives as cross-river traffic must use I-84 to get to Hood River City Center. VMT on SR-14 is lower than other corridor alternatives as traffic destined for Bingen may not need to use SR-14, and traffic destined for White Salmon will only use approximately 3 blocks of SR-14 before turning onto SR-140.
East – fixed span for all modes	With interchange operating at LOS B, ramp queuing should not be an issue.	VMT on I-84 is higher compared to the City Center or Existing Corridor alternatives as cross-river traffic must use I-84 to get to Hood River City Center. VMT on SR-14 is lower than other corridor alternatives as traffic destined for Bingen may not need to use SR-14, and traffic destined for White Salmon will only use approximately 3 blocks of SR-14 before turning onto SR-140.
No Action	Without signals or other additional traffic control at the I-84 ramps, ramp intersections are projected to operate at LOS F and ramp queues are projected to extend well onto the I-84 mainline.	VMT on I-84 is higher compared to the City Center alternative as cross-river traffic will likely use I-84 to get to Hood River City Center. VMT on SR-14 is lower than for City Center fixed span bridge alternative.

Appendix F – Alternatives Screening

SR-35 Tier II Technical Memorandum
Alternatives Screening

Criteria

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

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

The evaluation criteria corresponded to the seven objectives contained in the purpose and need statement. Both screenings used similar criteria. The criteria used in the second screening reflects comments received from the Oregon Collaborative Environmental and Transportation Agreement to Streamline (CETAS) and Washington Merger streamlining processes, advisory committee input, and public involvement.

Screening

Two screening processes occurred during Tier II. The first screening narrowed the 17 build alternatives to 6. The 17 build alternatives included:

- City Center Corridor
  - Floating movable bridge
  - Fixed span bridge for all modes
  - Fixed span bridge for vehicles and retrofit existing bridge for pedestrians and bicyclists
  - Movable bridge for vehicles and retrofit existing bridge for pedestrians and bicyclists
  - Movable bridge for all modes
  - Tunnel for vehicles and retrofit existing bridge for pedestrians and bicyclists
- Existing Corridor
  - Movable bridge (new) for vehicles and retrofit existing bridge for pedestrians and bicyclists
  - Movable bridge (new) for all modes

    - Fixed span bridge for vehicles and retrofit existing bridge for pedestrians and bicyclists
    - Fixed span bridge for all modes
    - Tunnel for vehicles and retrofit existing bridge for pedestrians and bicyclists
    - Tunnel for all modes
    - Intelligent transportation system (ITS)/Traffic management/Reversible lane operations
    - Retrofit of existing bridge for all modes

- East A Corridor
    - Movable bridge (new) for all modes
    - Fixed span bridge for vehicles and retrofit existing bridge for pedestrians and bicyclists
    - Fixed span bridge for all modes

The purpose of this screening process was to eliminate alternatives that did not meet the purpose and need for the project or had substantially high impacts across many of the project's goals and objectives.

The No Action alternative was also screened for comparative purposes. This alternative was automatically advanced to the next screening process.

The results of this first screening are provided in Table F-1. The six build alternatives recommended for further consideration included:

- City Center new fixed span bridge for all modes
- City Center new tunnel with existing bridge retrofit for pedestrian and bicycle use
- Existing new fixed span bridge for all modes
- Existing bridge retrofit for all modes
- East[1] new fixed span bridge with existing bridge retrofit for pedestrian and bicycle use
- East new fixed span bridge for all modes

With additional financial studies, cost estimates, environmental surveys, transportation analysis, and public input, these six alternatives went through a second screening

[1] The "East" corridor was previously called "East A" in Tier I and early stages of Tier II.

process. The results and rationale for qualitative ratings are provided in Tables F-2a and F-2b.

The second screening narrowed the alternatives from six build alternatives to one: the Existing corridor fixed span bridge for all modes. This build alternative was then differentiated into three alternative alignments with varying connections on the Washington shoreline.

The alternatives recommended for evaluation in the DEIS are:

- EC-1—West Connection to Dock Grade
- EC-2—West Alignment
- EC-3—East Alignment
- No Action

Table F-1. Tier II First Screening of Alternatives (Fall 2001)

	Alternatives																	
	City Center Corridor						Existing Corridor								East A Corridor			No Action
Criteria: Quantitative Application of Criteria where possible	Floating Movable Bridge,	Fixed Span Bridge for all modes	Fixed Span Bridge with Existing for Bikes/ Peds	Movable Bridge with Existing for Bikes/ Peds	Movable Bridge for all modes	Tunnel with Existing Bridge for Bikes/Peds	Movable Bridge, Keep Existing for Bikes/Peds	Movable Bridge, all modes	Fixed Span Bridge with existing for bikes/peds	Fixed Span Bridge for all modes	Tunnel with Existing Bridge for Bikes/peds	Tunnel for all modes	ITS/Traffic Management/ Reversible Lane Operations	Retrofit of Existing Bridge	Movable, all modes	Fixed Span Bridge with Existing for Bikes/Peds	Fixed Span Bridge for all modes	
Improve cross-river transportation of people and goods while accommodating standard-width river navigation																		
Vehicle miles traveled	M	M	M	M	M	H	L	L	L	L	M	M	L	L	M	M	M	L
Travel Time and Delay (Vehicle-hours)																		
Compliance with Roadway Geometric Standards (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Compliance with Navigation Channel Guidelines (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N
Ability to Handle Peak Traffic Episodes	H	H	H	H	H	H	L	L	L	L	L	L	M	L	L	L	L	M
Commercial Goods Mobility (proximity to truck routes, truck trip generators, river navigation) – VMT & Travel Time	M	M	M	M	M	H	L	L	L	L	M	M	M	L	M	M	M	M
Bicycle and pedestrian mobility – Tied to VMT																		
Bike Commuters	M	M	L	L	M	L	L	L	L	L	L	H	L	L	H	L	H	H
Bike Other	L	L	L	L	L	L	L	L	L	L	L	H	L	L	M	L	M	H
Impacts to the natural, built, and aesthetic environment																		
Federally listed threatened and endangered fish species and habitat	H	M	H	H	M	M	H	M	H	M	M	L/M	L	M	M	H	M	L
Federally listed threatened and endangered wildlife and plant species and habitat – Proximity to Bald Eagles	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	M	M	L
Other fish, wildlife and plant species and habitat	M	M	M	M	M	M	L	L	L	L	L	L	L	L	H	H	H	L
Visual resources	L	L	M	M	L	L	M	L	H	L	L	L	L	L	M	H	M	L
Land use plan consistency – Review Plans	M	M	M	M	M	M	L	L	L	L	L	L	L	L	H	H	H	M
Critical lands – geotechnical report	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Wetlands	L	L	L	L	L	L	M	M	M	M	L	L	L	L	M	M	M	L
Environmental Justice – Low Income and/or Minority Populations	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M?	M?	M?	M?

	Alternatives																	
	City Center Corridor						Existing Corridor								East A Corridor			No Action
Criteria: Quantitative Application of Criteria where possible	Floating Movable Bridge,	Fixed Span Bridge for all modes	Fixed Span Bridge with Existing for Bikes/ Peds	Movable Bridge with Existing for Bikes/ Peds	Movable Bridge for all modes	Tunnel with Existing Bridge for Bikes/Peds	Movable Bridge, Keep Existing for Bikes/Peds	Movable Bridge, all modes	Fixed Span Bridge with existing for bikes/peds	Fixed Span Bridge for all modes	Tunnel with Existing Bridge for Bikes/peds	Tunnel for all modes	ITS/Traffic Management/ Reversible Lane Operations	Retrofit of Existing Bridge	Movable, all modes	Fixed Span Bridge with Existing for Bikes/Peds	Fixed Span Bridge for all modes	
Impacts to Recreation																		
Water-based recreation – Windsurfing, boating	H	H	H	H	H	L	L	L	L	L	L	L	L	L	M	M	M	L
Land-based recreation – Bird watching, picnicking, concerts, etc.	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	L
Park lands	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	L
Impacts to cultural and historic resources																		
Archaeological resources impacted (number and significance)	M	M	M	M	M	M	H	H	H	H	H	H	L	H	M	M	M	L
Historic resources impacted (number and significance)	H	H	M	M	H	M	H	H	H	H	H	H	L	H	M	L	M	L
In lieu fishing sites	M	M	M	M	M	M	M	M	M	M	M	M	L	M	M	M	M	L
Financially acceptable and supports local economic development																		
Cost range without mitigation (Additional costs could include environmental mitigation, ROW acquisition, etc.)	L	L	M	H	L	H	M	L	L	L	H	H	L	L	L	L	L	N/A
Operating/Maintenance Costs	H	L	L	H	M	H	H	M	M	L	L	H	M	H	M	M	L	H
Impacts to local business and economy	H	M	M	M	M	L	L	L	L	L	L	L	L	L	L	L	L	L
Consistency with Local Plans and Policies (other than land use)	M	M	M	M	M	M	L	L	L	L	L	M	M	L	M	M	M	L
Impacts to economic development – both positive and negative	L	L	L	L	L	M	L	L	L	L	M	M	H	L	M	M	M	H
Construction Impacts	M	L	L	L	L	M	M	M	M	M	H	H	M	H	L	L	L	M
Home/business displacements	M	M	M	M	M	H	L	L	L	L	H	H	L	L	L	L	L	L
Integrity of the Interstate highway system																		
Interchange level-of-service	M	M	M	M	M	M	M	M	M	M	M	M	H	M	L	L	L	H
Ramp queuing	M	M	M	M	M	M	M	M	M	M	M	M	H	M	L	L	L	H
Safety – accident reduction	M	M	M	M	M	M	M	M	M	M	M	M	H	M	M	M	M	H

	Alternatives																	
	City Center Corridor						Existing Corridor								East A Corridor			No Action
Criteria: Quantitative Application of Criteria where possible	Floating Movable Bridge,	Fixed Span Bridge for all modes	Fixed Span Bridge with Existing for Bikes/ Peds	Movable Bridge with Existing for Bikes/ Peds	Movable Bridge for all modes	Tunnel with Existing Bridge for Bikes/Peds	Movable Bridge, Keep Existing for Bikes/Peds	Movable Bridge, all modes	Fixed Span Bridge with existing for bikes/peds	Fixed Span Bridge for all modes	Tunnel with Existing Bridge for Bikes/peds	Tunnel for all modes	ITS/Traffic Management/ Reversible Lane Operations	Retrofit of Existing Bridge	Movable, all modes	Fixed Span Bridge with Existing for Bikes/Peds	Fixed Span Bridge for all modes	
ADVANCE THIS ALTERNATIVE?																		
MT Recommendation	**No**	**Yes**	**Yes**	**No**	**No**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**Yes**	**No**	**No**	**Yes**	**Yes**
LAC Recommendation	**No**	**Yes**	**No**	**No**	**No**	**Yes***	**No**	**No**	**No**	**Yes**	**No**	**No**	**No**	**Yes***	**No**	**No**	**Yes**	**Yes**
SC Recommendation	**No**	**Yes**	**Yes+**	**No**	**No**	**Yes+***	**No**	**No**	**No**	**Yes**	**No**	**No**	**No**	**Yes+**	**No**	**Yes+**	**Yes**	**Yes**
DOT Regional Administrators' Decision	**No**	**Yes**	**No**	**No**	**No**	**Yes+***	**No**	**No**	**No**	**Yes**	**No**	**No**	**No**	**Yes**	**No**	**Yes+**	**Yes**	**Yes**

***With Reservations**

+Existing Bridge reconstructed as a fixed span bridge

Legend

H = High impact: A high level of adverse impacts is likely and mitigation measures to offset the impacts would be extensive or very expensive.

M = Moderate impact: A moderate level of adverse impacts is likely and mitigation measures and costs would be feasible or practical.

L = Low impact: There is a low potential for adverse impacts and little or no mitigation may be necessary.

Alternatives to Carry Forward

1: Fixed-Span, City Center: all modes

2: Tunnel, City Center: vehicles only, with bikes/pedestrians on existing bridge

3: Fixed-Span, Existing Corridor: for all modes

4: Retrofit of Existing Bridge

5a, b: Fixed Span, East A Corridor: either with all modes or keeping existing bridge for bikes and pedestrians

6: No-Action

Note: Where existing bridge is retained, retrofit includes a reconstruction to a fixed-span bridge.

Table F-2a. Tier II Second Screening of Alternatives (Spring 2002)

	City Center Corridor: Fixed Span Bridge for All Modes		City Center Corridor: Tunnel with Existing Bridge Retrofit for Pedestrians and Bikes		Existing Corridor: Fixed Span Bridge for All Modes		Existing Corridor: Retrofit Existing Bridge for All Modes	
Criteria	**Impact Rating**	**Explanation**	**Impact Rating**	**Explanation**	**Impact Rating**	**Explanation**	**Impact Rating**	**Explanation**
Improve cross-river transportation of people and goods while accommodating standard-width river navigation								
Vehicle miles traveled	M	70,302 daily VMT (2025), about 20% higher than the Existing Corridor.	H	86,800 daily VMT (2025), about 50% higher than the Existing Corridor.	L	58,700 daily VMT (2025); existing corridor facilities have lowest VMT of all alternatives.	L	58,700 daily VMT (2025); existing corridor facilities have lowest VMT of all alternatives.
Travel time and delay (Vehicle-hours)	M	LOS C/D at the I-84 ramps and SR-14 intersection. At I-84, non-river crossing traffic adds minor to moderate delays at the ramp intersections for river-crossing trips.	L	LOS C/D at the I-84 ramps and SR-14 intersection. At I-84, non-river crossing traffic adds minor to moderate delays at the ramp intersections for river-crossing trips. On Washington side, the intersection is approximately 1.2 miles closer to Bingen than the Fixed Span Bridge alternative, slightly lowering the travel distance and time.	M	LOS C/D at the I-84 ramps and SR-14 intersection. At I-84, non-river crossing traffic adds minor to moderate delays at the ramp intersections for river-crossing trips.	M	LOS C/D at the I-84 ramps and SR-14 intersection. At I-84, non-river crossing traffic adds minor to moderate delays at the ramp intersections for river-crossing trips.
Compliance with roadway geometric standards (Y/N)	Y	A new facility would have bicycle and pedestrian facilities, standard lane widths, and standard shoulders (for a two-lane section).	Y	A new facility would have standard lane widths, and standard shoulders (for a two-lane section). The existing bridge would be retrofitted for bike/pedestrian facilities and will comply with AASHTO design guidelines as well as ADA requirements.	Y	A new facility would have bicycle and pedestrian facilities, standard lane widths, and standard shoulders (for a two-lane section).	Y	A new facility would have bicycle and pedestrian facilities, standard lane widths, and standard shoulders (for a two-lane section).
Compliance with navigation channel guidelines (Y/N)	Y	Navigation channel width will be at least 300 feet, meeting the Army Corps and Tow Operators' recommended clearance.	Y	Not an issue for the tunnel since it is underneath the channel. Tunnel must be buried deep enough to attain at least a 43 foot depth clearance. The retrofit bridge would be brought into compliance.	Y	Navigation channel width will be at least 300 feet, meeting the Army Corps and Tow Operators' recommended clearance.	Y	Navigation channel width will be at least 300 feet, meeting the Army Corps and Tow Operators' recommended clearance.
Ability to handle peak traffic episodes	H	During partial or full road closures on US-26 east of Mount Hood, much of peak winter traffic is diverted to Oregon 35. If diverted traffic needs to cross the Columbia River, it would need to travel along I-84 to the City Center exit. It would then mix with the exisitng Hood River city center traffic, causing potentially significant traffic delays at I-84 and in Hood River's city center.	H	During partial or full road closures on US-26 east of Mount Hood, much of peak winter traffic is diverted to Oregon 35. If diverted traffic needs to cross the Columbia River, it would need to travel along I-84 to the City Center exit. It would then mix with the exisitng Hood River city center traffic, causing potentially significant traffic delays at I-84 and in Hood River's city center.	L	During partial or full road closures on US-26 east of Mount Hood, much of peak winter traffic is diverted to Oregon 35. Some of this traffic would use the Columbia River crossing, and if it is located here, it would not mix with Hood River city center traffic, reducing the potential for significant traffic delays at I-84.	L	During partial or full road closures on US-26 east of Mount Hood, much of peak winter traffic is diverted to Oregon 35. Some of this traffic would use the Columbia River crossing, and if it is located here, it would not mix with Hood River city center traffic, reducing the potential for significant traffic delays at I-84.
Commercial goods mobility (proximity to truck routes, truck trip generators, river navigation) – VMT & travel time	M	VMT of 70,302 (2025) is 20% higher than Existing corridor, increasing the distance trucks will need to travel across the river.	H	86,800 daily VMT (2025), about 50% higher than the Existing Corridor.	L	58,700 daily VMT (2025); existing corridor facilities have lowest VMT of all alternatives.	L	58,700 daily VMT (2025); existing corridor facilities have lowest VMT of all alternatives.
Bicycle and pedestrian mobility – Tied to VMT								
Bike commuters	M	Vehicle VMT is 20% higher than Existing corridor, increasing the distance bicycles will need to travel across the river.	L	Bicycles and pedestrians would use the existing bridge, which has shorter travel distances compared to vehicles using the tunnel.	L	Vehicle VMT in the Existing Corridor is the lowest of any alternatives, minimizing the distance bicycles will need to travel across the river.	L	Vehicle VMT in the Existing Corridor is the lowest of any alternatives, minimizing the distance bicycles will need to travel across the river.
Bike other	L	Proximity to recreational destinations (windsurfing sites) and Hood River city center may actually shorten some bike trips compared to Existing Corridor.	L	About the same travel distances as Existing corridor.	L	This is located approximately equidistant from Washington and Oregon recreational destinations compared to City Center or East Corridors. Shorter access to Bingen and White Salmon compared to City Center corridor, and shorter access to Hood River compared to East corridor.	L	This is located approximately equidistant from Washington and Oregon recreational destinations compared to City Center or East Corridors. Shorter access to Bingen and White Salmon compared to City Center corridor, and shorter access to Hood River compared to East corridor.
Connectivity to existing or programmed bike/pedestrian facilities	H	There are no existing or programmed bike/pedestrian facilities on SR-14 from the City Center touchdown point at SR-14 east to the Hood River Bridge intersection (where there is a programmed project to extend a bike/pedestrian path into Bingen). Shoulders on SR-14 are currently narrow and somewhat hazardous for bikes and pedestrians.	L	Connects on the Washington side to a programmed bike/pedestrian path along SR-14 from the Hood River Bridge to Bingen. Connects near Hood River city center on the Oregon side, and a path that crosses Hood River adjacent to I-84 to access Port of Hood River and city center.	L	Connects on the Washington side to a programmed bike/pedestrian path along SR-14 from the Hood River Bridge to Bingen. Connects near Hood River city center on the Oregon side, and a path that crosses Hood River adjacent to I-84 to access Port of Hood River and city center.	L	Connects on the Washington side to a programmed bike/pedestrian path along SR-14 from the Hood River Bridge to Bingen. Connects near Hood River city center on the Oregon side, and a path that crosses Hood River adjacent to I-84 to access Port of Hood River and city center.
Impacts to the natural, built, and aesthetic environment								
Federally listed threatened and endangered fish species and habitat	M	Rated like other single bridge options. Impacts from in-water construction during pier placement. Also, piers provide shaded areas from which predator fish, such as squawfish, can more effectively forage on salmon smolts.	M	Rated like other single bridge options. Impacts from in-water construction during pier placement associated with the retrofit of the existing bridge. Also, piers provide shaded areas from which predator fish, such as squawfish, can more effectively forage on salmon smolts.	M	Rated like other single bridge options. Impacts from in-water construction during pier placement. Also, piers provide shaded areas from which predator fish, such as squawfish, can more effectively forage on salmon smolts.	M	Rated like other single bridge options. Retrofit would have impacts from in-water construction during pier placement. Also, piers provide shaded areas from which predator fish, such as squawfish, can more effectively forage on salmon smolts.
Federally listed threatened and endangered wildlife species and habitat – proximity to bald eagles	L	No known impacts on federally listed wildlife species or habitat.	L	No known impacts on federally listed wildlife species or habitat.	L	No known impacts on federally listed wildlife species or habitat.	L	No known impacts on federally listed wildlife species or habitat.
Other fish, wildlife and plant species and habitat including wetlands	L	No substantial impacts identified. Impacts to non-listed fish would be minimized.	M	Rated higher than city center bridge due to portal impacts to intact forest habitat on Washington side north of SR 14, which includes potential habitat for the larch mountain salamander (a federal species of concern). Impacts to non-listed fish would be minimized.	L	No substantial impacts identified. Impacts to non-listed fish would be minimized.	L	No substantial impacts identified. Impacts to non-listed fish would be minimized.
Light and glare	M	Moves bridge lighting from existing corridor to new location.	L	Maintains the lighting associated with the existing bridge.	L	Maintains the presence of lighting along the existing bridge corridor.	L	Maintains the presence of lighting along the existing bridge corridor.
Noise	M	Moves traffic noise to new location.	L	Little operational noise impact. Overall lowest operational noise.	L	Reduced noise compared to existing open metal grate, which produces substantial noise. Similar traffic noise generation to other bridge options.	L	Reduced noise compared to existing open metal grate, which produces substantial noise.
Plans and policies consistency –								

Table F-2a. Tier II Second Screening of Alternatives (Spring 2002)

	City Center Corridor: Fixed Span Bridge for All Modes		City Center Corridor: Tunnel with Existing Bridge Retrofit for Pedestrians and Bikes		Existing Corridor: Fixed Span Bridge for All Modes		Existing Corridor: Retrofit Existing Bridge for All Modes	
Criteria	**Impact Rating**	**Explanation**	**Impact Rating**	**Explanation**	**Impact Rating**	**Explanation**	**Impact Rating**	**Explanation**
CRGNSA management plan	L	Introduces a new visual intrusion within the scenic area. Visual subordination requirement would need to be addressed for river-crossing portion of the new bridge. Both touchdown points are within urban areas that are exempt from the plan.	L	Avoids a new visual intrusion across the Columbia River in the scenic area. Maintains view of crossing at current location. Portals would be in the urban areas that are exempt from the plan.	L	Maintains the presence of a bridge in the existing corridor. Visual subordination requirement would need to be addressed for river-crossing portion of the new bridge. Both touchdown points are within urban areas that are exempt from the plan.	L	Maintains the presence of a bridge in the existing corridor. Visual subordination requirement would need to be addressed for river-crossing portion of the new bridge. Both touchdown points are within urban areas that are exempt from the plan.
Oregon statewide planning goals	L	Oregon touchdown point is within urban growth boundary. No goal exceptions required.	L	Oregon portal would be within urban growth boundaries.	L	Oregon touchdown location within urban growth boundary.	L	Oregon touchdown locations within urban growth boundaries.
Port master plans	M	Would require alteration of the Port of Hood River master plan for the event center area.	M	Would require alteration of the Port of Hood River master plan for the event center area.	L	Consistent with existing crossing location and patterns of development.	L	Consistent with existing crossing location and patterns of development.
Geology	H	Rated high because of potential seismic liquefaction on Oregon side approach and because of the steep slopes and cuts that would be required to create the Washington side touchdown and SR 14 widening, which would be needed to accommodate the increased traffic.	H	Potential seismic liquefaction in portal area on Hood River side. Substantial excavation required and portal construction on steep slope north of SR 14 near the existing bridge touchdown.	M	Potential seismic liquefaction in approach area on the Hood River side of the crossing.	M	Potential seismic liquefaction in approach area on Hood River side of crossing.
Water quality/quantity – storm water runoff, impervious surface, 303(d)	M	Potential water quality impact from in-water pier construction. Potential erosion from steep cut slope north of SR 14. Storm water run-off from bridge would be treated.	M	Although a drilled tunnel would reduce the potential for water quality impact, the retrofit of the existing bridge would involve new piers and removal of several existing piers, which would be accompanied by potential water quality impact. Storm water run-off from retrofitted bridge would be treated.	M	Potential water quality impact from in-water pier construction.	M	Potential water quality impact from in-water pier construction.
Environmental justice – low income and minority populations	L	No issues identified.	L	No issues identified.	L	No issues identified.	L	No issues identified.
Flood prone areas	L	Fewer piers in the river than with existing bridge, so no increase in flood hazards would be expected.	L	Retrofit would maintain or lessen hydraulic effects of piers within the river.	L	Fewer piers in the river than with existing bridge, so no increase in flood hazards would be expected.	L	Fewer piers in the river than with existing bridge, so no increase in flood hazards would be expected. Hydraulics would likely be improved.
Indirect and cumulative effects	M	New crossing at this location would likely facilitate planned development at the Port of Hood River site.	M	New crossing at this location would likely facilitate planned development at the Port of Hood River site.	L	Maintains support for existing development patterns.	L	Maintains support for existing development patterns.
Impacts to Recreation								
Water-based recreation – windsurfing, boating	H	Crosses area of heavy use by and prime value to windsurfers. Potential effects on windpatterns.	L	Avoids interference with existing windsurfing in the City Center Corridor.	L	No effect on existing use patterns.	L	No effect on existing use patterns.
Land-based recreation – bird watching, picnicking, concerts, etc.	M	Approaches and bridge adjacent to Port of Hood River Event Center water access area and parking.	L	Avoids proximity effects on access to the river at the Port of Hood River Event site, which is used for rigging and access to the river.	L	No effect on existing use patterns.	L	No effect on existing use patterns.
Park lands	L	No encroachment on public park lands.	L	No impact on public parks.	L	No encroachment on public parks.	L	No encroachment on public parks.
Impacts to cultural and historic resources								
Archaeological resources	L	No known sites in or near alignment.	L	One known site, Fan Rock, may be near the Washington portal.	H	One known site on Washington shore and two high probability areas (one on each shoreline).	H	One known site on Washington shore and two high probability areas (one on each shoreline).
Historic resources	H	Three historic resources, including demolition of the Hood River Bridge (likely to be eligible for listing), connection to SR-14 (Evergreen Highway), crossing of BNSF railway, and nearing the UPRR.	H	Three historic resources, including demolition of the Hood River Bridge (likely to be eligible for listing), connection to SR-14 (Evergreen Highway), crossing of BNSF railway, and nearing the UPRR.	H	Three historic resources, including demolition of the Hood River Bridge (likely to be eligible for listing), connection to SR-14 (Evergreen Highway), and crossing of BNSF railway.	H	Three historic resources, including demolition of the Hood River Bridge (likely to be eligible for listing), connection to SR-14 (Evergreen Highway), and crossing of BNSF railway.
In lieu fishing sites	L	No known sites in or near alignment.	L	No known sites in or near alignment.	M	One in lieu fishing access site on Washington shoreline.	M	One in lieu fishing access site on Washington shoreline.
Financially acceptable and supports local economic development								
Cost range without mitigation (Additional costs could include environmental mitigation, ROW acquisition, etc.)	$115 million	Cost estimate includes demolition of existing bridge, embankment, abutment, bridge structure, and systems work.	$400 Million	Cost estimate includes retrofit of existing bridge for pedestrians and bicycles, tunnel construction (cut and cover and bored), and systems work.	$115 Million	Cost estimate includes demolition of existing bridge, embankment, abutment, bridge structure, and systems work.	$140 Million	Cost estimate includes retrofit of existing bridge, embankment, abutment, bridge structure, and systems work.
Operating and maintenance costs	L	Costs would consisit of tollbooth operations and regular maintenance and inspections.	M	Costs would consisit of tollbooth operations for the tunnel, regular maintenance and inspections for both the tunnel and bridge, and personnel to operate lift span on the existing bridge.	L	Costs would consisit of tollbooth operations and regular maintenance and inspections.	L	Costs would consisit of tollbooth operations, regular maintenance and inspections, and personnel to operate lift span.
Impacts to local business, economy and economic development	M	While having relatively low adverse impacts on existing business accessibility, this alternative will significantly impact adjacent area recreational use which is expected to have some negative impact on local recreation/tourism-related businesses. This alternative is not expected to negatively alter adjacent economic development trends, and may support Port of Hood River redevelopment.	M	Lowest adverse impacts to local businesses of any alternative outside of the existing corridor; except for displacement, does not signficantly affect existing business accessibility or recreational-related businesses. Tunnel portals would consume or encumber a moderate amount of real estate, which could constrain future development/redevelopment, especially in the Port of Hood River area.	L	Similar alignment to the existing bridge results in low impacts/little change to local businesses and economic activity. Adverse construction impacts likely to be more than offset by access improvements to reduce congestion near the toll booth. Not expected to negatively impact existing economic development patterns.	L	Essentially the same as No Action with low impacts/little change to local businesses and economic activity. Any adverse construction impacts on business likely to be more than offset by access improvements to reduce congestion adjacent to the toll booth. Not expected to alter existing economic development patterns.
Construction impacts	M	Impacts would include in-water work associated with demolition of existing bridge and in-water work to install new piers. Vehicles would continue to use existing bridge until new bridge construction is complete.	M	Impacts would include in-water work associated with retrofit of existing bridge, excavation work for cut and cover tunnel, and boring for bored tunnel segment. Vehicles would continue to use existing bridge until tunnel construction is complete.	M	Impacts would include in-water work associated with demolition of existing bridge and in-water work to install new piers. Vehicles would continue to use existing bridge until new bridge construction is complete.	H	Impacts would include in-water work associated with demolition of existing bridge and in-water work to install new piers. A high rating was assigned because vehicles would be travelling through active construction.
Home/business displacements	M	Some businesses will likely be displaced on the Hood River side bridge approach area.	H	Tunnel portals will displace more existing businesses/ development in Hood River than other alternatives.	L	Few, if any displacements required, and limited to the Oregon approach area depending on bridge and access realignment.	L	No displacements expected.
Integrity of the Interstate highway system and National Highway System								

Table F-2a. Tier II Second Screening of Alternatives (Spring 2002)

	City Center Corridor: Fixed Span Bridge for All Modes		City Center Corridor: Tunnel with Existing Bridge Retrofit for Pedestrians and Bikes		Existing Corridor: Fixed Span Bridge for All Modes		Existing Corridor: Retrofit Existing Bridge for All Modes	
Criteria	**Impact Rating**	**Explanation**	**Impact Rating**	**Explanation**	**Impact Rating**	**Explanation**	**Impact Rating**	**Explanation**
Interchange level-of-service	M	I-84 Interchange should operate at a satisfactory LOS C or D in peak periods.	M	I-84 Interchange should operate at a satisfactory LOS C or D in peak periods.	M	I-84 Interchange should operate at a satisfactory LOS C or D in peak periods.	M	I-84 Interchange should operate at a satisfactory LOS C or D in peak periods.
Ramp queuing	M	Existing traffic signals and ramp configurations should be adequate to store ramp queues without extending onto the I-84 mainline. Traffic growth in Hood River city center may result in longer queues than in other alternatives.	M	Existing traffic signals and ramp configurations should be adequate to store ramp queues without extending onto the I-84 mainline. Traffic growth in Hood River city center may result in longer queues than in other locations.	M	Providing traffic signals or roundabouts at the I-84 ramps, along with improvements at the four-way stop at the retail/Port intersection and toll booth operational improvement, should alleviate the potential for ramp queues to extend onto the I-84 mainline.	M	Providing traffic signals or roundabouts at the I-84 ramps, along with improvements at the four-way stop at the retail/Port intersection and toll booth operational improvement, should alleviate the potential for ramp queues to extend onto the I-84 mainline.
Safety – accident reduction	M	Ramp queues should not extend onto the I-84 mainline, minimizing accident potential. There may be a higher level of weaving between the City Center and Oregon 35 interchanges under this alternative, creating a slightly higher potential for accidents on I-84.	M	Ramp queues should not extend onto the I-84 mainline, minimizing accident potential. There may be a higher level of weaving between the City Center and Oregon 35 interchanges under this alternative, creating a slightly higher potential for accidents on I-84.	M	Ramp queues should not extend onto the I-84 mainline, with signalized (or roundabout) ramp termini, minimizing accident potential. There may be a higher level of weaving between the City Center and Oregon 35 interchanges under this alternative, creating a slightly higher potential for accidents on I-84.	M	Ramp queues should not extend onto the I-84 mainline, with signalized (or roundabout) ramp termini, minimizing accident potential. There may be a higher level of weaving between the City Center and Oregon 35 interchanges under this alternative, creating a slightly higher potential for accidents on I-84.
VMT on Interstate or NHS facility	M	VMT on SR-14 is increased as trips on the Washington side, primarily destined for White Salmon or Bingen, must travel further on SR-14 to reach their destination compared to the Existing Corridor.	L	Since much of the cross-river traffic is between Hood River and White Salmon/Bingen, this option allows those trips to enter Hood River without having to use I-84. On the Washington side, the connection to SR-14 is at the existing bridge location, which minimizes the VMT on SR-14 to get to White Salmon or Bingen.	M	VMT on I-84 is higher compared to the City Center alternatives as cross-river traffic will likely use I-84 to get to Hood River City Center. VMT on SR-14 is lower than for City Center fixed span bridge alternative.	M	VMT on I-84 is higher compared to the City Center alternative as cross-river traffic will likely use I-84 to get to Hood River City Center. VMT on SR-14 is lower than for City Center fixed span bridge alternative.
ADVANCE THIS ALTERNATIVE TO THE DEIS?								
MT Recommendation March 2002	**No**	Key reasons for elimination: --adverse impacts associated with water-based recreation, and --severe geologic constraints on Washington side bridge landing.	No	Key reasons for elimination: --substantial increase in VMT, --substantial excavation in steep slope on Washington side portal, --high cost, and --high level of business displacement in Hood River.	Yes	Key reasons for advancing: --lowest impacts to transportation, --lowest impacts to environmental resources, --lowest impacts to recreation, and --lowest cost.	No	Key reasons for elimination: --identical low impacts as Existing new fixed span except it has higher capital costs and higher construction impacts.
LAC Recommendation May 2002								
SC Recommendation May 2002								
DOT Regional Administrators' Decision June 2002								

Table F-2b. Tier II Second Screening of Alternatives (Spring 2002)

	East Corridor: Fixed Span Bridge with Existing Bridge Retrofit for Pedestrians & Bikes		East Corridor: Fixed Span Bridge for All Modes		No Action	
Criteria	**Impact Rating**	**Explanation**	**Impact Rating**	**Explanation**	**Impact Rating**	**Explanation**
Vehicle miles traveled	M	73,200 daily VMT (2025), about 25% higher than the Existing Corridor and slightly higher than City Center.	M	73,200 daily VMT (2025), about 25% higher than the Existing Corridor and slightly higher than City Center.	L	58,700 daily VMT (2025); existing corridor facilities have lowest VMT of all alternatives.
Travel time and delay (Vehicle-hours)	L	LOS B at the I-84 ramps and SR-14 intersection. At I-84, there is no non-river crossing traffic adding to delays at the ramp intersections, so delay is minimal. At SR-14, intersection is in downtown Bingen with good access to SR-140 to White Salmon, with minor to moderate vehicle delays.	L	LOS B at the I-84 ramps and SR-14 intersection. At I-84, there is no non-river crossing traffic adding to delays at the ramp intersections, so delay is minimal. At SR-14, intersection is in downtown Bingen with good access to SR-140 to White Salmon, with minor to moderate vehicle delays.	H	Without signals or other additional traffic control at the I-84 ramps, ramp intersections are projected to operate at LOS F and ramp queues are projected to extend well onto the I-84 mainline. Delays on the ramps and in the bridge area will be over two minutes per vehicle.
Compliance with roadway geometric standards (Y/N)	Y	A new facility would have standard lane widths, and standard shoulders (for a two-lane section). The existing bridge would be retrofitted for bike/pedestrian facilities and will comply with AASHTO design guidelines as well as ADA requirements.	Y	A new facility would have bicycle and pedestrian facilities, standard lane widths, and standard shoulders (for a two-lane section).	N	Lane widths of 9.5 feet are substandard and there are no bike/pedestrian facilities.
Compliance with navigation channel guidelines (Y/N)	Y	Navigation channel width will be at least 300 feet, meeting the Army Corps and Tow Operators' recommended clearance.	Y	Navigation channel width will be at least 300 feet, meeting the Army Corps and Tow Operators' recommended clearance.	N	Navigation channel is significantly less than the recommended 300 foot horizontal clearance.
Ability to handle peak traffic episodes	L	During partial or full road closures on US-26 east of Mount Hood, much of peak winter traffic is diverted to Oregon 35. Some of this traffic would use the Columbia River crossing, and if it is located here, it would not mix with Hood River city center traffic nor would there be any other non-river crossing traffic, reducing the potential for significant traffic delays at I-84.	L	During partial or full road closures on US-26 east of Mount Hood, much of peak winter traffic is diverted to Oregon 35. Some of this traffic would use the Columbia River crossing, and if it is located here, it would not mix with Hood River city center traffic nor would there be any other non-river crossing traffic, reducing the potential for significant traffic delays at I-84.	M	During partial or full road closures on US-26 east of Mount Hood, much of peak winter traffic is diverted to Oregon 35. Some of this traffic would use the Columbia River crossing, and if it is located here, it would not mix with Hood River city center traffic, reducing the potential for significant traffic delays at I-84. However, lack of traffic signals at the I-84 ramps would add to delays for ramp traffic.
Commercial goods mobility (proximity to truck routes, truck trip generators, river navigation) – VMT & travel time	M	73,200 daily VMT (2025), about 25% higher than the Existing Corridor and slightly higher than City Center.	M	73,200 daily VMT (2025), about 25% higher than the Existing Corridor and slightly higher than City Center.	M	Although VMT at the existing corridor is the lowest of the alternatives, the lack of traffic signals at I-84 and SR-14 add to delay for trucks.
Bicycle and pedestrian mobility – Tied to VMT						
Bike commuters	L	Vehicle VMT in the Existing Corridor is the lowest of any alternatives, minimizing the distance bicycles will need to travel across the river.	H	Vehicle VMT is 25% higher than Existing corridor, increasing the distance bicycles will need to travel across the river. For bicycles, this increased distance is more significant compared to trips being made in vehicles.	H	No provision is made for a bike/pedestrian facility on the river crossing, which is a high negative impact.
Bike other	L	This is located approximately equidistant from Washington and Oregon recreational destinations compared to City Center or East Corridors. Shorter access to Bingen and White Salmon compared to City Center corridor, and shorter access to Hood River compared to East corridor with a new bridge for all modes.	M	Although it has good proximity to Bingen Pond and Koberg State Park, travel distances to non-work and other recreational destinations are higher than alternatives in other corridors.	H	No provision is made for a bike/pedestrian facility on the river crossing, which is a high negative impact.
Connectivity to existing or programmed bike/pedestrian facilities	L	Connects on the Washington side to a programmed bike/pedestrian path along SR-14 from the Hood River Bridge to Bingen. Connects near Hood River city center on the Oregon side, and a path that crosses Hood River adjacent to I-84 to access Port of Hood River and city center.	M	Connects on the Washington side to central Bingen with relatively good access to SR-140 and White Salmon. No connection from Hood River city center to Oregon approach to new bridge.	H	No provision is made for a bike/pedestrian facility on the river crossing. No cross-river connection would be possible between the programmed bike/pedestrian facility along SR-14 from the Hood River Bridge to Bingen on the Washington side or the existing facility between the Port of Hood River and city center on the Oregon side.
Impacts to the natural, built, and aesthetic environment						
Federally listed threatened and endangered fish species and habitat	H	Ranked highest of the options because it has the greatest amount of in-water work associated with a new bridge and retrofitting the existing bridge. Also, provides more piers and associated shading, which supports predator foraging on salmon smolts.	M	Rated like other single bridge options. Impacts from in-water construction during pier placement. Also, piers provide shaded areas from which predator fish, such as squawfish, can more effectively forage on salmon smolts.	L	Avoids in-water work associated with existing bridge removal and construction of new bridge or retrofit. However, existing piers catch large debris, which creates predator habitat.
Federally listed threatened and endangered wildlife species and habitat – proximity to bald eagles	M	Closer to known bald eagle nest than options at City Center and Existing corridors.	M	Closer to known bald eagle nest than options at City Center and Existing corridors.	L	No effect.
Other fish, wildlife and plant species and habitat including wetlands	H	Rated high because of proximity to Bingen Pond, which is a highly regarded habitat for birds; peregrine falcon nesting habitat on cliffs south of I-84;and potential wetland and river encroachment at a new interchange with I-84. Impacts to non-listed fish would be minimized.	H	Rated high because of proximity to Bingen Pond, which is a highly regarded habitat for birds; peregrine falcon nesting habitat on cliffs south of I-84;and potential wetland and river encroachment at a new interchange with I-84. Impacts to non-listed fish would be minimized.	L	No effect.
Light and glare	M	Would introduce lighting adjacent to Bingen Pond, thereby altering habitat conditions.	M	Would introduce lighting adjacent to Bingen Pond, thereby altering habitat conditions.	L	Maintains existing lighting on bridge.
Noise	M	Would introduce noise adjacent to Bingen Pond, thereby altering habitat conditions.	M	Would introduce noise adjacent to Bingen Pond, thereby altering habitat conditions.	H	Maintains high noise level of the existing bridge (however, reduced to "L" rating in the future with Port's plan to re-deck the existing bridge).
Plans and policies consistency –						

Table F-2b. Tier II Second Screening of Alternatives (Spring 2002)

	East Corridor: Fixed Span Bridge with Existing Bridge Retrofit for Pedestrians & Bikes		East Corridor: Fixed Span Bridge for All Modes		No Action	
Criteria	**Impact Rating**	**Explanation**	**Impact Rating**	**Explanation**	**Impact Rating**	**Explanation**
CRGNSA management plan	H	Introduces a new visual intrusion within the scenic area. Visual subordination requirement would need to be addressed for river-crossing portion of the new and retrofitted bridges. The Oregon touchdown for the new bridge would be outside the urban exempt area, which also needs to meet visual subordination requirements.	M	Introduces a new visual intrusion within the scenic area. Visual subordination requirement would need to be addressed for river-crossing portion of the new bridge. The Oregon touchdown would be outside the urban exempt area, which also needs to meet visual subordination requirements.	L	Maintains the status quo.
Oregon statewide planning goals	H	The Oregon touchdown of the new bridge would be outside the urban growth boundary. Four goal exceptions would need to be approved. Justification must be provided as to why alternatives within the UGB cannot reasonably meet the identified transportation needs.	H	The Oregon touchdown of the new bridge would be outside the urban growth boundary. Four goal exceptions would need to be approved. Justification must be provided as to why alternatives within the UGB cannot reasonably meet the identified transportation needs.	L	Maintains the status quo.
Port master plans	L	Consistent with the Port of Klickitat's master plan.	L	Consistent with the Port of Klickitat's master plan.	M	No effect on Port of Hood River plan; not consistent with the Port of Klickitat plan.
Geology	M	Potential seismic liquefaction in approach area on Bingen side of the crossing.	M	Potential seismic liquefaction in approach area on Bingen side of the crossing.	L	No effect.
Water quality/quantity – storm water runoff, impervious surface, 303(d)	H	Potential water quality impact during construction associated with in-water work. Rated higher than other alternatives because it involves new bridge construction and retrofit of the existing bridge. Potential runoff issues related to runoff from bridge to Bingen Pond and Columbia River.	M	Potential water quality impact during construction associated with in-water work. Potential runoff issues related to runoff from bridge to Bingen Pond and Columbia River.	H	Ongoing water quality impacts due to lack of runoff collection and treatment before water enters river. Highest potential for uncontained spill of hazardous material from bridge.
Environmental justice – low income and minority populations	M	Potential low income residential displacements in Bingen near intersection with SR 14. Potential indirect impacts may occur through increased neighborhood traffic in low income area of Bingen.	M	Potential low income residential displacements in Bingen near intersection with SR 14. Potential indirect impacts may occur through increased neighborhood traffic in low income area of Bingen.	N/A	No action being taken to evaluate disproportionate impacts.
Flood prone areas	M	Approach on Washington side may be located within the floodplain of the Columbia River. Two bridges would have more piers in the river than single bridge alternatives. Flood hazards would be minimized.	M	Approach on Washington side may be located within the floodplain of the Columbia River. Fewer piers in the river than with existing bridge, so no increase in flood hazards would be expected.	L	Existing hydraulic conditions maintained.
Indirect and cumulative effects	M	New crossing at this location would likely facilitate planned development at the Port of Klickitat site. Cumulative impact may result from incremental, planned development around the perimeter of Bingen Pond.	M	New crossing at this location would likely facilitate planned development at the Port of Klickitat site. Cumulative impact may result from incremental, planned development around the perimeter of Bingen Pond. Future development on Oregon touchdown area would be severely limited due to limited or prohibited access.	L	Some development adjacent to Bingen Pond could have impacts on the habitat. No Action alternative would not contribute to indirect and cumulative impacts.
Impacts to Recreation						
Water-based recreation – windsurfing, boating	M	Potential conflict with windsurfing at the Port of Klickitat launch area.	M	Potential conflict with windsurfing at the Port of Klickitat launch area.	L	No impact.
Land-based recreation – bird watching, picnicking, concerts, etc.	M	Effects on habitat may affect the quality of the bird watching experience. Traffic noise could affect noise conditions at the outdoor concert site at the Port of Klickitat.	M	Effects on habitat may affect the quality of the bird watching experience. Traffic noise could affect noise conditions at the outdoor concert site at the Port of Klickitat.	L	No impact. Does not provide for bicycle or pedestrian crossings.
Park lands	H	New interchange on Oregon side would encroach on state-owned parkland (Koberg State Park). Potential Section 4(f) impacts would need to be evaluated and minimized.	H	New interchange on Oregon side would encroach on state-owned parkland (Koberg State Park). Potential Section 4(f) impacts would need to be evaluated and minimized.	L	No impact.
Impacts to cultural and historic resources						
Archaeological resources	M	One high probability area on Washington shoreline.	M	One high probability area on Washington shoreline.	L	No effect on cultural resources.
Historic resources	H	Seven historic resources, including substantial retrofit of the Hood River Bridge (likely to be eligible for listing), connection to SR-14 (Evergreen Highway), crossing of BNSF railroad, and possible relocation/demolition of four structures (may not be significant resources).	H	Seven historic resources, including demolition of the Hood River Bridge (likely to be eligible for listing), connection to SR-14 (Evergreen Highway), crossing of BNSF railway, and possible relocation/demolition of four structures (may not be significant resources).	L	No effect on cultural resources.
In lieu fishing sites	M	One in lieu fishing access site on Oregon shoreline.	M	One in lieu fishing access site on Oregon shoreline.	L	No effect on cultural resources.
Financially acceptable and supports local economic development						
Cost range without mitigation (Additional costs could include environmental mitigation, ROW acquisition, etc.)	$175 Million	Cost estimate includes retrofit of existing bridge, embankment, abutment, bridge structure, and systems work. Additional costs for a new interchange with I-84 and a temporary track for BNSF railway are included.	$125 Million	Cost estimate includes retrofit of existing bridge, embankment, abutment, bridge structure, and systems work. Additional costs for a new interchange with I-84, a new pedestrian/bikeway from the interchange to the Hood River city center are included, and a temporary track for BNSF railway.	N/A	N/A
Operating and maintenance costs	L	Costs would consisit of tollbooth operations, regular maintenance and inspections, and personnel to operate lift span on the existing bridge.	L	Costs would consisit of tollbooth operations and regular maintenance and inspections.	H	High costs are expected for maintenance activities associated with the existing bridge. Personnel are also needed to be on-site for tollbooth and lift span operations.

Table F-2b. Tier II Second Screening of Alternatives (Spring 2002)

	East Corridor: Fixed Span Bridge with Existing Bridge Retrofit for Pedestrians & Bikes		East Corridor: Fixed Span Bridge for All Modes		No Action	
Criteria	**Impact Rating**	**Explanation**	**Impact Rating**	**Explanation**	**Impact Rating**	**Explanation**
Impacts to local business, economy and economic development	M	Not expected to affect overall business accessibility and economic activity. May shift a small portion of local business patronage from Hood River to Bingen. This alternative would benefit Port of Klickitat development plans with direct access but may hinder development in Hood River relative to the existing and city center alternatives.	M	Not expected to affect overall business accessibility and economic activity. May shift a small portion of local business patronage from Hood River to Bingen. This alternative would benefit Port of Klickitat development plans with direct access but may hinder development in Hood River relative to the existing and city center alternatives.	H	Basis of comparison assumes no impacts/change to existing trends in local businesses and economic activity. However, substandard design makes bridge a poor choice for cross-river motor freight movement and growing congestion at Oregon approach near the toll booth is likely to increasingly impede access to the bridge and surrounding Port of Hood River property.
Construction impacts	L	Impacts would include in-water work associated with retrofit of existing bridge and in-water work to install new piers. Vehicles would continue to use existing bridge until new bridge construction is complete.	L	Impacts would include in-water work associated with demolition of existing bridge and in-water work to install new piers. Vehicles would continue to use existing bridge until new bridge construction is complete.	N/A	N/A
Home/business displacements	M	Likely to cause displacement of some homes in Bingen in order to provide a connection to SR-14.	M	Likely to cause displacement of some homes in Bingen in order to provide a connection to SR-14.	L	No displacements envisioned.
Integrity of the Interstate highway system and National Highway System						
Interchange level-of-service	L	The I-84 interchange would be strictly for bridge traffic and is projected to operate at LOS B in peak periods. Interchange operations should be protected as there will be no land access at the interchange.	L	The I-84 interchange would be strictly for bridge traffic and is projected to operate at LOS B in peak periods. Interchange operations should be protected as there will be no land access at the interchange.	H	Without signals or other additional traffic control at the I-84 ramps, ramp intersections are projected to operate at LOS F.
Ramp queuing	L	With interchange operating at LOS B, ramp queuing should not be an issue.	L	With interchange operating at LOS B, ramp queuing should not be an issue.	H	Without signals or other additional traffic control at the I-84 ramps, ramp queues are projected to extend well onto the I-84 mainline.
Safety – accident reduction	M	Ramp queues should not extend onto the I-84 mainline, minimizing accident potential. There may be a higher level of weaving between this interchange and the Oregon 35 interchanges under this alternative, creating a slightly higher potential for accidents on I-84.	M	Ramp queues should not extend onto the I-84 mainline, minimizing accident potential. There may be a higher level of weaving between this interchange and the Oregon 35 interchanges under this alternative, creating a slightly higher potential for accidents on I-84.	H	Without signals or other additional traffic control at the I-84 ramps, ramp intersections are projected to operate at LOS F and ramp queues are projected to extend well onto the I-84 mainline, carrying with it significant increased accident potential.
VMT on Interstate or NHS facility	M	VMT on I-84 is higher compared to the City Center or Existing Corridor alternatives as cross-river traffic must use I-84 to get to Hood River City Center. VMT on SR-14 is lower than other corridor alternatives as traffic destined for Bingen may not need to use SR-14, and traffic destined for White Salmon will only use approximately 3 blocks of SR-14 before turning onto SR-140.	M	VMT on I-84 is higher compared to the City Center or Existing Corridor alternatives as cross-river traffic must use I-84 to get to Hood River City Center. VMT on SR-14 is lower than other corridor alternatives as traffic destined for Bingen may not need to use SR-14, and traffic destined for White Salmon will only use approximately 3 blocks of SR-14 before turning onto SR-140.	M	VMT on I-84 is higher compared to the City Center alternative as cross-river traffic will likely use I-84 to get to Hood River City Center. VMT on SR-14 is lower than for City Center fixed span bridge alternative.
ADVANCE THIS ALTERNATIVE TO THE DEIS?						
MT Recommendation March 2002	No	Key reasons for elimination: --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).	No	Key reasons for elimination: --high VMT 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.	Yes	Required for consideration in the DEIS.
LAC Recommendation May 2002						
SC Recommendation May 2002						
DOT Regional Administrators' Decision June 2002						