



## Summary



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This Final Environmental Impact Statement (FEIS) is prepared to comply with the National Environmental Policy Act of 1969 (NEPA), a federal law that governs all projects receiving federal funding or receiving permits from federal agencies. Three agencies are leading the NEPA process for this project—the Federal Highway Administration (FHWA), the Oregon Department of Transportation (ODOT), and Multnomah County, Oregon. This FEIS, which was prepared following FHWA’s environmental process and guidelines for preparing an FEIS, complies with FHWA NEPA regulations. FHWA has approved this document.

A Draft Environmental Impact Statement (DEIS), distributed in November 2008 (FHWA et al., 2008), evaluated a No Build Alternative and five Build alternatives, lettered A through E. Two public briefings, an open house, and a public hearing were held in November and December 2008. After fully considering and evaluating public and agency comments, the project’s Policy Advisory Group (PAG) recommended Alternative D as the preferred alternative. (The PAG is described later in this summary.) The Multnomah County Board of Commissioners, Clackamas County Board of Commissioners, Metro Council, Portland City Council, and ODOT adopted Alternative D as the preferred alternative in February and March of 2009.

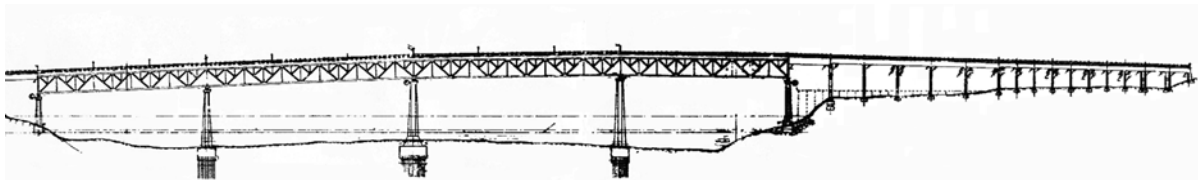
Alternative D, which has been refined to address public and agency comments and minimize impacts, is evaluated as Alternative D Refined in this FEIS. Therefore, this FEIS evaluates the economic, social, and natural resource effects of

the No Build Alternative, the five Build alternatives evaluated in the DEIS, and the preferred alternative (Alternative D Refined).

Following distribution of this FEIS, if any comments received on this FEIS can be satisfied within the context of the preferred alternative, FHWA will issue a Record of Decision. FHWA approval of any of the Build alternatives, including the preferred alternative, would allow Multnomah County to move ahead with selection of a bridge type and project design.

## Description of the Proposed Action

The Sellwood Bridge project would rehabilitate or replace the Sellwood Bridge located in Portland, Multnomah County, Oregon. After more than 80 years, the Sellwood Bridge has reached the end of its useful service life. The bridge was constructed in 1925 to replace the Spokane Street Ferry, which shuttled passengers across the Willamette River between Sellwood and southwest Portland. The bridge, approximately 1,900 feet in length, is extremely narrow—two lanes, no shoulders or median, and one narrow sidewalk that must accommodate light poles, pedestrians, and bicyclists. The bridge crosses the Willamette River on SE Tacoma Street on the east end and intersects with Oregon 43 (OR 43, also known as SW Macadam Avenue within the city limits of Portland) on the west end. The following four main issues identify the need for this project:



*The Sellwood Bridge was constructed in 1925 to replace the Spokane Street Ferry.*

*Summary of All Reasonable Actions Considered*  
Summary

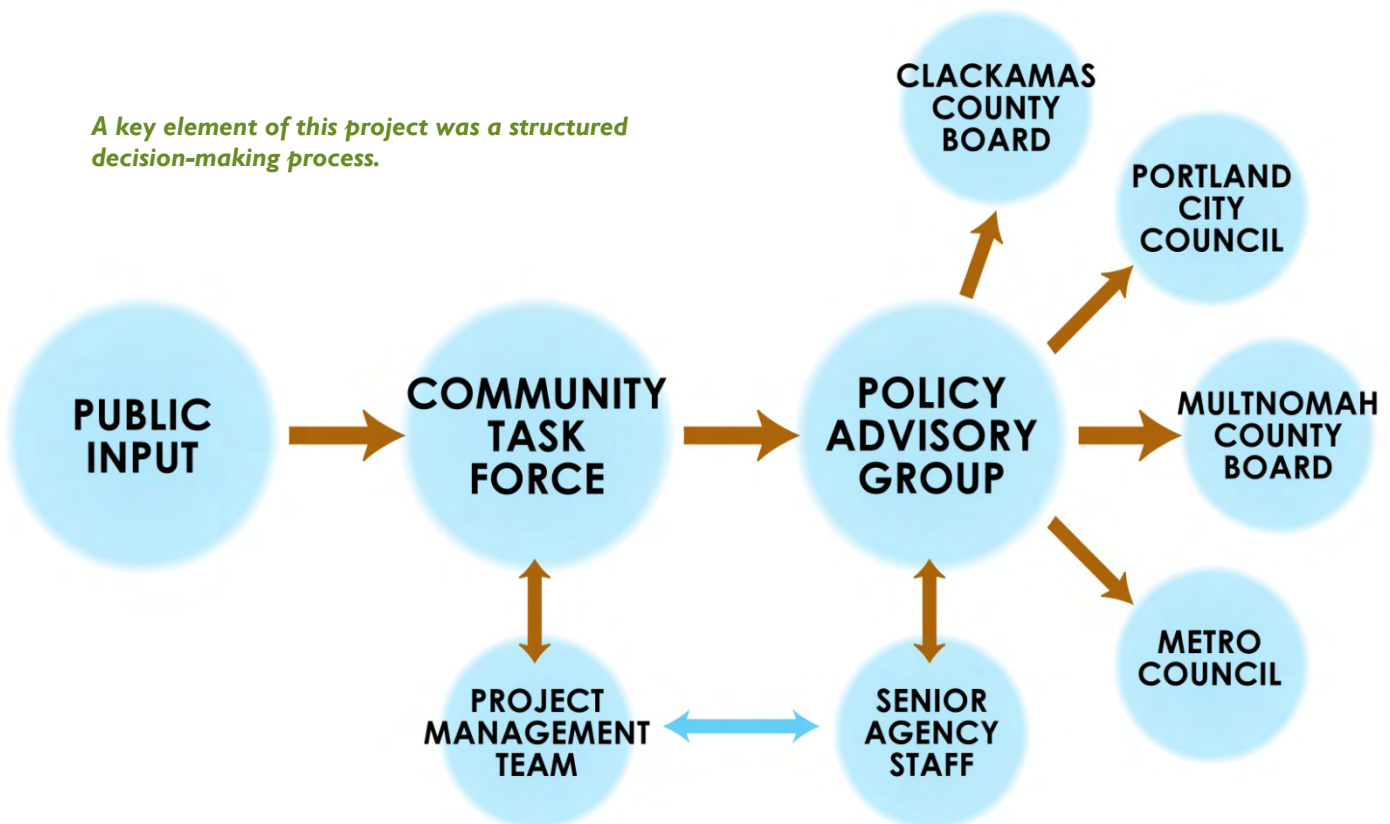
- Inadequate structural integrity to safely accommodate various vehicle types (including transit vehicles, trucks, and emergency vehicles) and to withstand moderate seismic events
- Substandard and unsafe roadway design
- Substandard pedestrian and bicycle facilities across the river
- Existing and future travel demands between origins and destinations served by the Sellwood Bridge exceed available capacity

## Summary of All Reasonable Actions Considered

### Decision-Making Process

A key element of the project was creating a decision-making process. Because the Sellwood Bridge project is complex, with many stakeholders and interest groups wanting to participate, the project team established a structured decision-making process at the outset.

*A key element of this project was a structured decision-making process.*



This process helped to direct community input related to key project milestones, referred to as major “decision points.” Primary groups involved in the decision-making process included the following:

- **Project Management Team (PMT).** Guided the day-to-day execution of the project. The PMT included staff from Multnomah County, Metro, City of Portland, ODOT, FHWA, and the consulting team.
- **Community Task Force (CTF).** Made recommendations to the PAG at each decision point. The CTF was comprised of representatives from neighborhoods on both sides of the bridge; local and regional business groups; advocates for different bridge user groups (such as commuters, freight and transit users, river users, pedestrians, and bicyclists); and representatives of natural resource, historic resource, and aesthetic interests.
- **Policy Advisory Group (PAG).** Made decisions at each decision point. The PAG was comprised of elected and appointed

officials of local agencies and jurisdictions with regulatory responsibility for the project or those who had a strong interest in the outcome. These officials included individuals from Multnomah County, Clackamas County, City of Portland, City of Milwaukie, Metro, ODOT, TriMet, FHWA, and the Oregon Legislature.

- **Senior Agency Staff (SAS).** Advised the PMT and the PAG. The SAS was comprised of senior level staff from each of the PAG member organizations.
- **Working Groups.** Provided input to the CTF and PMT on particular issues. Each working group was comprised of consultants, agency staff, and experts who volunteered their services.

Chapter 5 of this FEIS describes the composition, roles, and responsibilities of these five groups in more detail. While these groups provided input and were involved in identifying a preferred alternative, FHWA will select an alternative when it issues the Record of Decision.

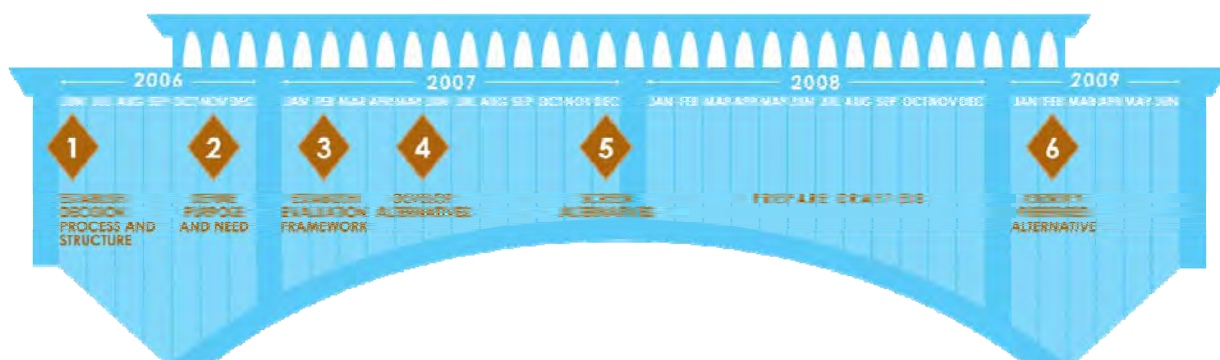
The CTF, PAG, and PMT guided this process, charting a logical path through the six major decision points. The public involvement program was established around each of the decision points:

1. **Establish Decision Process and Structure.** The first major decision point ensured understanding and agreement about the project’s decision process and structure,

and about the roles, responsibilities, and membership of the various project groups (PAG, CTF, PMT, and SAS and working groups).

2. **Define Purpose and Need.** The second major decision point, conducted in the summer and fall of 2006, established the need for the project and defined the problems the project was expected to address.
3. **Establish Evaluation Framework.** The third major decision point, conducted in late 2006 and early 2007, established threshold and evaluation criteria that were used in subsequent decision points for screening and identifying alternatives for further study. The evaluation framework set criteria and quantitative performance measures to gauge the effectiveness of alternatives—how well they solved the identified problems and how well they performed against the broad range of stakeholder values. Through this process, the stakeholders adopted threshold and evaluation criteria (project goals).
4. **Develop Alternatives.** The fourth major decision point, conducted in the spring of 2007, developed a broad range of alternatives to address the purpose and need of the project (Decision Point 2). The aim of this step was to ensure that the stakeholders were consulted and their ideas were considered. After a broad range of concepts were identified, concepts were screened against the threshold criteria, alternatives were developed, and a range of alternatives

*The project included six major decision points through an alternatives development and evaluation process.*



were adopted for more detailed evaluation. Alternatives consisted of the following three elements and, if applicable, other concepts:

- **Bridge Alignments.** Refers to the location of the river crossing. The project team developed seven bridge alignments and a tunnel alignment, and the public suggested four additional bridge alignments. All alignments started on SE Tacoma Street on the east side of the Willamette River, but the location of the connection to OR 43 on the west bank varied by alignment.
- **Interchange Types.** Refers to the connection of the Sellwood Bridge with OR 43 on the west side of the river. The project team developed ten interchange/ intersection-type concepts to connect the west end of the bridge with OR 43. These concepts included a mix of at-grade, two-level, and three-level configurations, as well as a mix of signalized and unsignalized interchange forms.
- **Basic Bridge Cross-sections.** Refers to the various configurations of the bridge deck, including travel/transit lanes, bicycle lanes, sidewalks, and shared-use paths. Initially, over 40 possible basic bridge cross-section concepts were developed.
- **Other Concepts.** Refers to other concepts that were advanced, including:
  - Using a temporary detour bridge for traffic access across the river during construction.
  - Using the existing bridge for bicyclist and pedestrian facilities with a replacement bridge for motorized vehicles on a separate alignment.

The feasible concepts were combined to form project alternatives. The various combinations of alignments, cross-sections, interchange types, and other concepts

produced over 100 unique alternatives for evaluation.

5. **Screen Alternatives.** The fifth major decision point, conducted in the summer of 2007, identified alternatives for analysis in the DEIS. A team of technical experts rated the performance of the over 100 unique alternatives against each of 37 evaluation criteria. Performance ratings were either qualitative or quantitative. Input from the public and CTF was used to eliminate alignments and cross-section types and identify alternatives for further evaluation in the DEIS. Next, the CTF and PAG screened alternatives using the evaluation criteria and selected five alternatives (that the PAG adopted) to be carried forward for additional analysis in the DEIS.

The project team then prepared the DEIS to analyze the selected alternatives. FHWA approved the DEIS before it was released in November 2008. The project team provided the results of the DEIS to the stakeholders, the public, and elected officials for use in identifying a preferred alternative.

6. **Identify Preferred Alternative.** The project completed the sixth and final major decision point, identification of the preferred alternative, in early 2009. A formal public comment period and a formal public hearing were held following distribution of the DEIS. The PAG considered the analysis documented in the DEIS, CTF input, and public comments when identifying a preferred alternative. The Multnomah County Board of Commissioners, Clackamas County Board of Commissioners, Metro Council, Portland City Council, and ODOT adopted the preferred alternative. FHWA will ultimately select the preferred alternative when it issues the Record of Decision.

All major decision points featured public involvement activities that included the following elements: briefings, newsletters, open houses, an

**TABLE S-1**  
**Cooperating and Participating Agencies**

<b>Federal Agencies</b>	
Federal Emergency Management Agency (p)	U.S. Army Corps of Engineers (c)
National Marine Fisheries Service (c)	U.S. Environmental Protection Agency (c)
U.S. Coast Guard (c)	U.S. Fish and Wildlife Service (c)
<b>State Agencies</b>	
Oregon Department of Environmental Quality (p)	Oregon Division of State Lands (p)
Oregon Department of Fish and Wildlife (p)	Oregon State Historic Preservation Office (p)
Oregon Department of Land Conservation and Development (p)	
<b>Tribes and Local Agencies</b>	
Confederated Tribes of Siletz (p)	Clackamas County (p)
City of Milwaukie (p)	Metro (p)
City of Portland (p)	TriMet (p)

c = cooperating agency

p = participating agency

interactive project Web site, online surveys, and a speakers' bureau.

## Lead, Cooperating, and Participating Agencies

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) authorizes federal surface transportation programs through fiscal year 2009. (The United States Congress has extended SAFETEA-LU into fiscal year 2010.) Section 6002 of SAFETEA-LU created consolidated and enhanced environmental streamlining regulations. It requires transportation agencies to work together with the public, resource agencies, and other interested parties to establish timeframes for the environmental review of transportation projects. The efficient and effective coordination of multiple environmental reviews, analysis, and permitting actions is essential for meeting the environmental streamlining mandates under SAFETEA-LU.

The lead agencies for this project are Multnomah County, FHWA, and ODOT. In accordance with

Section 6002 of SAFETEA-LU, various agencies were invited to participate in the project as cooperating or participating agencies. The cooperating and participating agencies involved in the project are listed in Table S-1. Each of these agencies was afforded the opportunity to comment at each of the six decision points in the project. Chapter 5 of this FEIS describes the agency coordination process in more detail.

## Alternatives Evaluated in the DEIS

The DEIS, distributed in November 2008, evaluated a No Build Alternative and five Build alternatives, lettered A through E. The Build alternatives were assembled from compatible combinations of alignments, bridge cross-sections, bridge design types, west-end interchange types, and east-end intersection types. These features were evaluated within the context of individual Build alternatives. However, some features could be substituted into other Build alternatives.

Under the **No Build Alternative**, the existing infrastructure would remain the same and the bridge would continue to operate as it does today. The bridge, west-side interchange configuration, and east-side bridge approach would not change. Multnomah County has identified maintenance activities under the No Build Alternative that would be necessary to keep the bridge operational and in as good a condition as possible for the next 20 years.

The following Build alternatives were evaluated in the DEIS.

- **Alternative A** would rehabilitate the existing bridge for motorized vehicles and would add a separate bicycle/pedestrian bridge 300 feet north of the existing bridge. The river crossing would be closed during construction.
- **Alternative B** would rehabilitate the existing bridge and widen it on the north side. It would include the option for a temporary detour bridge to keep the river crossing open during construction.
- **Alternative C** would consist of a double-deck bridge replacement on the existing alignment. The river crossing would be closed during construction.
- **Alternative D** would consist of a replacement bridge on the existing alignment, widened to the south. The river crossing would remain open during construction.
- **Alternative E** would replace the existing bridge on a new alignment to the north. The river crossing would remain open during construction.

## Summary of the Preferred Alternative (Alternative D Refined)

Two public briefings, an open house, and a public hearing were held in November and December

of 2008. After public and agency comments were fully considered and evaluated, local elected officials recommended, and the Multnomah County Board of Commissioners, Clackamas County Board of Commissioners, Metro Council, Portland City Council, and ODOT adopted, Alternative D as the preferred alternative. (Alternative D as evaluated in the DEIS with a bicyclist/pedestrian-activated signal at the SE Tacoma Street/SE 6th Avenue intersection.) Alternative D, which has been refined to address public and agency comments and minimize environmental impacts, is evaluated as Alternative D Refined in this FEIS. Therefore, this FEIS evaluates a No Build Alternative, the five Build alternatives evaluated in the DEIS, and the preferred alternative (Alternative D Refined).

The following refinements to Alternative D address public and agency comments received on the DEIS and minimize environmental impacts:

- Revised the bicycle/pedestrian ramps on the west end of the bridge from a spiral design on both sides of the bridge to a single, long switchback on both sides of the bridge connecting to the existing north-south trail network to reduce impacts to Powers Marine Park and natural resource areas. This refinement shifted the interchange footprint slightly to the west.
- Refined the OR 43 roadway footprint to reduce impacts to Willamette Moorage Park and Powers Marine Park.
- Reduced the width of the bridge on the west end from five lanes to four lanes to narrow the bridge.
- Realigned the roadway from the west side of the signalized intersection providing access to the Superintendent's House at River View Cemetery, Powers Marine Park, and the Staff Jennings property to accommodate a future streetcar line, as preferred by the City of Portland. The realigned access would cross on the west side, behind the Superintendent's House, instead of on the east side, in front of

it. The River View Cemetery owners supported the realignment of this roadway.

- Removed the bicycle/pedestrian trail south of the bridge to reduce park and natural resource impacts within Powers Marine Park. Extended the bicycle/pedestrian path north to SW Miles Street to provide continuity.
- Moved the driveway access to Willamette Moorage Park and Macadam Bay Club further north to improve safety and reduce park impacts.
- Refined the cross-section of SE Tacoma Street between the east end of the Sellwood Bridge and SE 6th Avenue to provide the same bicycle and pedestrian facilities as the Sellwood Bridge (12-foot-wide sidewalks and 6.5-foot-wide shoulders/bicycle lanes). Between the east end of the Sellwood Bridge and SE 6th Avenue, water quality swales for stormwater treatment could also be incorporated.

Alternative D with these design refinements constitutes the preferred alternative. Similar to Alternative D, the preferred alternative (Alternative D Refined) would consist of a replacement bridge on the existing alignment, widened to the south. The river crossing would be constructed in stages to maintain traffic across the river during construction. However, traffic access across the bridge would be affected periodically by interim closures to replace the existing bridge and construct the new bridge.

Table S-2 summarizes the characteristics of Alternative D Refined and the Build alternatives evaluated in the DEIS (Alternatives A through E). Section 2.3 in Chapter 2 of this FEIS describes the differences between Alternative D and Alternative D Refined in more detail.

## Summary of Major Environmental Impacts

Table S-3 summarizes major environmental impacts among the No Build Alternative and Build

alternatives by social or natural environment discipline and element. Appendix G of this FEIS provides a summary of proposed and committed mitigation and environmental measures.

## Areas of Controversy

Thousands of public comments were received throughout the public involvement process. The comments included issues and themes that have influenced project decision-making, directly shaping the range of alternatives and, ultimately, the elements of the alternatives analyzed in this document. This FEIS addresses many of the issues raised. The other comments are outside the scope of the project and, therefore, are not discussed in this FEIS. However, the project team has attempted to respond to the most frequently voiced issues through community meetings and in public outreach information, such as the project Web site and newsletters. Table S-4 lists the most frequently voiced issues from public involvement activities, along with the associated responses. Appendix I provides the responses to formal comments submitted by individuals and agencies on the DEIS, and Appendix J provides copies of the original comments received via the Open House and mailed in.

## Major Unresolved Issues with Other Agencies

The major unresolved issues are:

- Funding sources for the No Build Alternative or any of the Build alternatives. Multnomah County has identified a preliminary financial plan to fund construction of the Sellwood Bridge project from various funding sources. For Multnomah County to move ahead with construction of the project, FHWA would have to approve a Financial Plan that demonstrated how the project would be funded.
- Because accesses near the Sellwood Bridge/OR 43 interchange would be in

violation of state access management spacing standards, ODOT would need to grant a deviation from access management spacing standards for Build alternatives A, B, D, and D Refined. Multnomah County, ODOT, and the City of Portland collaboratively developed the *OR 43: Sellwood Bridge IAMP* (ODOT, 2010) for the proposed OR 43/ Sellwood Bridge reconstructed interchange to address access to Willamette Moorage Park, Macadam Bay Club, River View Cemetery, Powers Marine Park, and the Staff Jennings property.

- ODOT agreed to grant a deviation from the access spacing standard for the relocated Macadam Bay Club driveway subject to conditions stipulated in the IAMP that changes could be made if safety problems were to arise in the future.
- The IAMP provides for a future alley, easement, or tract connecting to SW Miles Street that would provide the Macadam Bay Club and the other businesses in the area an alternative access. This would be constructed upon redevelopment.
- ODOT agreed to grant a deviation for the new roadway providing access to River View Cemetery, Powers Marine Park, and the Staff Jennings property from the new interchange. The volume of traffic that would use this road is expected to be very low and would not adversely affect traffic operations or safety in the interchange.

Because details of project designs will continue to evolve until construction, ODOT will evaluate the appropriateness of the

access concepts during the project’s final design phase.

- Inter-governmental agreements between Multnomah County and Metro for the Willamette Shoreline Trolley, the streetcar undergoing planning, and the Willamette Greenway Trail (West Bank). The cost included in this project is for the replacement of existing right-of-way; the track replacement; any fill or structure required; and the construction of any necessary retaining walls.
- Approvals from various federal, state, and local actions (listed in the next subsection).

## Other Federal, State, and Local Actions Required for the Proposed Action

A number of actions are required before final project approval would occur, as shown in Table S-5.

FHWA, in cooperation with ODOT and Multnomah County, intends to issue a “statute of limitations” (SOL) notice in the *Federal Register*, pursuant to 23 United States Code (USC) Section 139(l). This notice would indicate that one or more federal agencies have taken final action on permits, licenses, or approvals for this transportation project. This SOL notice would establish that claims seeking judicial review of those federal-agency actions would be barred unless such claims were filed within 180 days after the date of publication of the notice in the *Federal Register*. Multnomah County will also make the SOL notice available on the project website at <http://www.sellwoodbridge.org>.

**TABLE S-2**  
**Build Alternative Characteristics**

Alternative	A	B	C	D	E	D Refined
Rehabilitation or Replacement	<ul style="list-style-type: none"> <li>Rehabilitation</li> </ul>	<ul style="list-style-type: none"> <li>Rehabilitation</li> </ul>	<ul style="list-style-type: none"> <li>Replacement</li> </ul>	<ul style="list-style-type: none"> <li>Replacement</li> </ul>	<ul style="list-style-type: none"> <li>Replacement</li> </ul>	<ul style="list-style-type: none"> <li>Replacement</li> </ul>
Alignment	<ul style="list-style-type: none"> <li>Existing</li> </ul>	<ul style="list-style-type: none"> <li>Existing</li> </ul>	<ul style="list-style-type: none"> <li>Existing</li> </ul>	<ul style="list-style-type: none"> <li>Existing</li> </ul>	<ul style="list-style-type: none"> <li>North of existing bridge</li> </ul>	<ul style="list-style-type: none"> <li>Existing</li> </ul>
Bridge Cross-section	<ul style="list-style-type: none"> <li>39 feet wide</li> <li>Two 12-foot-wide travel lanes</li> <li>Two 6-foot-wide shoulders</li> <li>Two 1.5-foot-wide railings</li> </ul>	<ul style="list-style-type: none"> <li>57 feet wide</li> <li>Two 11-foot-wide travel lanes</li> <li>Two 5-foot-wide shoulders/ bike lanes</li> <li>Two 1.5-foot-wide railings</li> <li>Two 10-foot-wide sidewalks</li> <li>Two 1-foot-wide outer railings</li> </ul>	<ul style="list-style-type: none"> <li>45 feet wide</li> <li>Three 12-foot-wide travel lanes</li> <li>Two 3-foot-wide shoulders</li> <li>Two 1.5-foot-wide railings</li> </ul>	<ul style="list-style-type: none"> <li>64 feet wide</li> <li>Two 12-foot-wide travel lanes</li> <li>Two 6.5-foot-wide shoulders/ bike lanes</li> <li>Two 12-foot-wide shared-use sidewalks</li> <li>Two 1.5-foot-wide railings</li> </ul>	<ul style="list-style-type: none"> <li>75 feet wide</li> <li>Two 12-foot-wide travel lanes for traffic</li> <li>Two 12-foot-wide travel lanes for transit</li> <li>16-foot- and 8-foot-wide shared-use sidewalks</li> <li>Two 1.5-foot-wide railings</li> </ul>	<ul style="list-style-type: none"> <li>64 feet wide</li> <li>Two 12-foot-wide travel lanes</li> <li>Two 6.5-foot-wide shoulders/bike lanes</li> <li>Two 12-foot-wide shared-use sidewalks</li> <li>Two 1.5-foot wide railings</li> </ul>
Other Features	<ul style="list-style-type: none"> <li>Separate 20-foot-wide bike/ pedestrian bridge with two 1.5-foot-wide railings (total width of 23 feet)</li> <li>Seismic retrofit equivalent to Phase II<sup>a</sup></li> <li>Meets seismic standards</li> </ul>	<ul style="list-style-type: none"> <li>Seismic retrofit equivalent to Phase II<sup>a</sup></li> <li>Meets seismic standards</li> </ul>	<ul style="list-style-type: none"> <li>Double-deck bridge</li> <li>20-foot-wide shared-use path on lower deck with two 1.5-foot-wide railings (total width of 23 feet)</li> <li>Meets seismic standards</li> </ul>	<ul style="list-style-type: none"> <li>Meets seismic standards</li> </ul>	<ul style="list-style-type: none"> <li>Meets seismic standards</li> </ul>	<ul style="list-style-type: none"> <li>Meets seismic standards</li> </ul>
West-side Interchange	<ul style="list-style-type: none"> <li>Roundabout on upper level</li> <li>Free-flow OR 43 on lower level of two-level interchange</li> <li>Relocates approximately 900 linear feet of railway right-of-way</li> </ul>	<ul style="list-style-type: none"> <li>Roundabout on upper level</li> <li>Free-flow OR 43 on lower level of two-level interchange</li> <li>Relocates approximately 900 linear feet of railway right-of-way</li> </ul>	<ul style="list-style-type: none"> <li>Trumpet (free-flow) interchange</li> <li>Free-flow OR 43 on lower level of two-level interchange</li> <li>Relocates approximately 1,700 linear feet of railway right-of-way</li> </ul>	<ul style="list-style-type: none"> <li>Signalized intersection on upper level</li> <li>Free-flow OR 43 on lower level of two-level interchange</li> <li>Relocates approximately 1,000 linear feet of railway right-of-way</li> </ul>	<ul style="list-style-type: none"> <li>Signalized intersection on upper level</li> <li>Free-flow OR 43 on lower level of two-level interchange</li> <li>Relocates approximately 800 linear feet of railway right-of-way</li> </ul>	<ul style="list-style-type: none"> <li>Signalized intersection on upper level</li> <li>Free-flow OR 43 on lower level of two-level interchange</li> <li>Relocates approximately 1,000 linear feet of railway right-of-way</li> </ul>
East-side Intersection	<ul style="list-style-type: none"> <li>Same as existing (eastbound left turn permitted at SE 6th Avenue)</li> </ul>	<ul style="list-style-type: none"> <li>Same as existing (eastbound left turn permitted at SE 6th Avenue)</li> </ul>	<ul style="list-style-type: none"> <li>Eastbound left turn to SE 6th Avenue restricted</li> <li>Right turn to loop under bridge</li> </ul>	<ul style="list-style-type: none"> <li>Signal at SE Tacoma Street/SE 6th Avenue intersection</li> <li>Bicyclist/pedestrian-activated signal at SE Tacoma Street/SE 6th Avenue intersection</li> </ul>	<ul style="list-style-type: none"> <li>Signal at SE Tacoma Street/SE 6th Avenue intersection</li> </ul>	<ul style="list-style-type: none"> <li>Bicyclist/pedestrian-activated signal at SE Tacoma Street/SE 6th Avenue intersection</li> </ul>

**TABLE S-2**  
**Build Alternative Characteristics**

Alternative	A	B	C	D	E	D Refined
Potential Bridge Type <sup>b</sup>	<ul style="list-style-type: none"> <li>Retain existing bridge (i.e., continuous-truss span)</li> <li>Stress-ribbon or cable-stayed for bike/pedestrian bridge</li> </ul>	<ul style="list-style-type: none"> <li>Retain existing bridge (i.e., continuous-truss span)</li> </ul>	<ul style="list-style-type: none"> <li>Through-arch</li> </ul>	<ul style="list-style-type: none"> <li>Delta-frame or deck-arch</li> </ul>	<ul style="list-style-type: none"> <li>Box-girder or through-arch</li> </ul>	<ul style="list-style-type: none"> <li>Delta-frame or deck-arch</li> </ul>
Property Access	<ul style="list-style-type: none"> <li>New roadway to provide access to River View Cemetery, Powers Marine Park, and the Staff Jennings property</li> <li>Relocated access to Willamette Moorage Park and Macadam Bay Club</li> </ul>	<ul style="list-style-type: none"> <li>New roadway to provide access to River View Cemetery, Powers Marine Park, and the Staff Jennings property</li> <li>Relocated access to Willamette Moorage Park and Macadam Bay Club</li> </ul>	<ul style="list-style-type: none"> <li>No motor vehicle access from OR 43 to River View Cemetery or Powers Marine Park</li> <li>Relocated access to Willamette Moorage Park and Macadam Bay Club</li> <li>Powers Marine Park accessed by footpath from Willamette Moorage Park</li> </ul>	<ul style="list-style-type: none"> <li>New roadway to provide access to River View Cemetery, Powers Marine Park, and the Staff Jennings property</li> <li>Relocated access to Willamette Moorage Park and Macadam Bay Club</li> </ul>	<ul style="list-style-type: none"> <li>New roadway to provide access to River View Cemetery, Powers Marine Park, and the Staff Jennings property</li> <li>Relocated access to Willamette Moorage Park and Macadam Bay Club</li> </ul>	<ul style="list-style-type: none"> <li>Revised new roadway to provide access to River View Cemetery, Powers Marine Park, and the Staff Jennings property</li> <li>Revised new access to Willamette Moorage Park and Macadam Bay Club</li> </ul>
Traffic Access during Construction	<ul style="list-style-type: none"> <li>No traffic access during construction</li> <li>Traffic diverted to other existing bridges</li> </ul>	<ul style="list-style-type: none"> <li>Temporary detour bridge option to maintain traffic access</li> </ul>	<ul style="list-style-type: none"> <li>No traffic access during construction</li> <li>Traffic diverted to other existing bridges</li> </ul>	<ul style="list-style-type: none"> <li>Bridge construction staged to maintain traffic access during construction<sup>c</sup></li> </ul>	<ul style="list-style-type: none"> <li>Traffic access maintained on existing bridge during construction of the new bridge</li> </ul>	<ul style="list-style-type: none"> <li>Bridge construction staged to maintain traffic access during construction<sup>c</sup></li> </ul>
Construction Cost (in 2012 dollars) <sup>d,e</sup>	<ul style="list-style-type: none"> <li>\$331 million (stress-ribbon bike/pedestrian bridge)</li> <li>\$337 million (cable-stayed bike/pedestrian bridge)</li> <li>Right-of-way cost of \$15.8 million<sup>f</sup></li> </ul>	<ul style="list-style-type: none"> <li>\$326 million</li> <li>\$356 million (including temporary detour bridge)</li> <li>Right-of-way cost of \$15.8 million<sup>f</sup>; \$17.1 million including temporary detour bridge<sup>f</sup></li> </ul>	<ul style="list-style-type: none"> <li>\$280 million</li> <li>Right-of-way cost of \$20.9 million<sup>f</sup></li> </ul>	<ul style="list-style-type: none"> <li>\$293 million (delta-frame bridge)</li> <li>\$311 million (deck-arch bridge)</li> <li>Right-of-way cost of \$25.8 million<sup>f</sup></li> </ul>	<ul style="list-style-type: none"> <li>\$281 million (box-girder bridge)</li> <li>\$361 million (through-arch bridge)</li> <li>Right-of-way cost of \$35.7 million<sup>f</sup></li> </ul>	<ul style="list-style-type: none"> <li>\$299 million (deck-arch bridge)</li> <li>\$290 million (delta-frame bridge)</li> <li>Right-of-way cost of \$27.0 million<sup>f</sup></li> </ul>

**TABLE S-2**  
**Build Alternative Characteristics**

Alternative	A	B	C	D	E	D Refined
Construction Cost Breakdown (in 2012 dollars) <sup>d,e</sup>	<ul style="list-style-type: none"> <li>Rehabilitated vehicle bridge: \$185 million</li> <li>Bike/pedestrian bridge: \$52 million (stress-ribbon); \$58 million (cable-stayed)</li> <li>West-side interchange: \$93 million</li> <li>East-side intersection: \$1.6 million</li> </ul>	<ul style="list-style-type: none"> <li>Rehabilitated vehicle bridge: \$222 million</li> <li>Temporary detour bridge: \$30 million</li> <li>West-side interchange: \$102 million</li> <li>East-side intersection: \$1.6 million</li> </ul>	<ul style="list-style-type: none"> <li>Replacement bridge: \$185 million</li> <li>West-side interchange: \$90 million</li> <li>East-side intersection: \$5.4 million</li> </ul>	<ul style="list-style-type: none"> <li>Replacement bridge: \$202 million (delta-frame); \$220 million (deck-arch)</li> <li>West-side interchange: \$89 million</li> <li>East-side intersection: \$1.9 million</li> </ul>	<ul style="list-style-type: none"> <li>Replacement bridge: \$189 million (box-girder); \$269 million (through-arch)</li> <li>West-side interchange: \$88 million</li> <li>East-side intersection: \$3.9 million</li> </ul>	<ul style="list-style-type: none"> <li>Replacement bridge: \$171 million (delta-frame); \$180 million (deck-arch)</li> <li>West-side interchange: \$113 million</li> <li>East-side intersection: \$2.1 million</li> <li>Cost includes approximately \$4 million for mitigation<sup>e,f</sup></li> </ul>

<sup>a</sup> Initially it was planned to include an option for rehabilitation of the existing bridge with Phase I seismic retrofit only, and a separate option for rehabilitation of the existing bridge with both Phase I and Phase II seismic retrofits. During development of the rehabilitation alternative design for the DEIS, it was determined the most cost-effective rehabilitation approach incorporated the equivalent of both Phase I and Phase II seismic retrofits. There is no way to separate the various elements that provide earthquake resistance from the elements required to strengthen the structure.

<sup>b</sup> Bridge design types are specified in this FEIS for analysis purposes only to identify impacts and estimate costs and construction activities.

<sup>c</sup> Traffic access across the bridge would be periodically affected by interim closures to replace the existing bridge and construct the new bridge.

<sup>d</sup> These estimates are based on conceptual-design-level data to provide a basis for cost comparisons between alternatives. More detailed cost data will be available following the preliminary design of the preferred alternative.

<sup>e</sup> The Alternatives A through E construction cost includes a 40-percent contingency to include cultural resource and park/recreational facility mitigation. The preferred alternative (Alternative D Refined) includes a 35-percent contingency because mitigation costs have been estimated.

<sup>f</sup> The DEIS reported 2009 right-of-way costs for Alternatives A through E. The right-of-way costs have been updated.

**TABLE S-3**  
**Summary of Anticipated Impacts of the No Build Alternative and the Build Alternatives**

Discipline	Element	No Build Alternative	Alternative A	Alternative B and Alternative B with Temporary Detour Bridge (if different from Alt. B)
3.1 Transportation	Bridge closure during construction	Traffic would be detoured for up to 8 months for maintenance activities.	Traffic would be detoured for 24 months during construction.	Traffic would be detoured for up to 24 months during construction. <i>A temporary detour bridge would provide a river crossing</i>
	West-side interchange impacts	Same interchange as existing conditions.	Would operate at LOS B under most conditions. However, because of capacity constraints on SE Tacoma Street, congested eastbound traffic across the Sellwood Bridge could back up into the roundabout during the afternoon/evening peak period, blocking all movements through the interchange. For this reason, ramp meters would be added to the ramps to avoid the condition where all movements were blocked.	Would operate at LOS B under most conditions. However, because of capacity constraints on SE Tacoma Street, congested eastbound traffic across the Sellwood Bridge could back up into the roundabout during the afternoon/evening peak period, blocking all movements through the interchange. For this reason, ramp meters would be added to the ramps to avoid the condition where all movements were blocked.
	East-side connection – SE Tacoma Street/SE 6th Avenue intersection	Same as existing conditions.	Same as existing conditions.	Same as existing conditions.

Alternative C	Alternative D	Alternative E	Preferred Alternative (Alternative D Refined)
Traffic would be detoured for 42 months during construction.	Staged construction would allow traffic to continue to cross the river during construction, except for interim closures to replace the existing bridge and construct the new bridge.	Traffic would be maintained on the existing bridge during construction of the new bridge.	Staged construction would allow traffic to continue to cross the river during construction, except for interim closures to replace the existing bridge and construct the new bridge.
Would operate at LOS B or better. Trumpet interchange would provide better mobility and queuing than the roundabout interchange type. This interchange type is a free-flow design, but would operate within the constraints on SE Tacoma Street and OR 43.	Would operate at LOS D or better. Signalized intersection on upper level would provide better mobility and queuing than the roundabout interchange type under peak-hour conditions. Would provide free flow on OR 43, but would operate within the constraints on OR 43.	Would operate at LOS D or better. Signalized intersection on upper level would provide better mobility and queuing than the roundabout interchange type under peak-hour conditions. Would provide free flow on OR 43, but would operate within the constraints on OR 43.	Would operate at LOS D or better. Signalized intersection on upper level would provide better mobility and queuing than the roundabout interchange type under peak-hour conditions. Would provide free flow on OR 43, but would operate within the constraints on OR 43.
The SE Grand Avenue extension would improve accessibility between Sellwood Bridge and areas north of SE Tacoma Street and west of SE 13th Avenue. Minimal to moderate levels of increased neighborhood cut-through traffic could result.	Signalization would result in LOS F conditions with traffic demands exceeding the intersection's capacity by about 40 percent. This would cause unacceptable vehicle delays and queues, and moderate to substantial increases in neighborhood cut-through traffic.	Signalization would result in LOS F conditions with traffic demands exceeding the intersection's capacity by about 40 percent. This would cause unacceptable vehicle delays and queues, and moderate to substantial increases in neighborhood cut-through traffic.	Same as existing conditions, except when the bicyclist/pedestrian signal is activated. When activated, traffic on SE Tacoma Street would be impeded. The City of Portland would monitor the effects on traffic operations and make adjustments as necessary to ensure safe and efficient conditions.

**TABLE S-3, Cont.**  
**Summary of Anticipated Impacts of the No Build Alternative and the Build Alternatives**

Discipline	Element	No Build Alternative	Alternative A	Alternative B and Alternative B with Temporary Detour Bridge (if different from Alt. B)
3.2 Bicyclists and Pedestrians	Facilities	Limited facilities on bridge structure. Single sidewalk on north side, varies in width from 4 feet 3 inches to 3 feet at light poles.	Accommodates bi-directional traffic on separate 20-foot-wide bicycle/pedestrian bridge.	Railing provides separation from motorized traffic. Challenging crossing environment for visually impaired at roundabout crossings.
	Safety	Dangerous passing maneuvers because of sharing the narrow bridge sidewalk. Unsafe connections through west-side interchange area. Unsafe connections to TriMet bus stop at OR 43/River View Cemetery.	Bicyclists and pedestrians on separate structure eliminates conflicts with vehicles on bridge and in the west-side interchange Security concerns because of complete separation from other bridge users.	Difficult crossings of SE Tacoma Street because of heavy traffic volumes and lack of crossing treatments.
	Connections	Difficult connections between bridge sidewalk and surrounding facilities, through west-side interchange area, to the OR 43/ River View Cemetery bus stop, and crossing of SE Tacoma Street because of heavy traffic and minimal crossing treatments.	Difficult crossings of SE Tacoma Street because of heavy traffic volumes and lack of crossing treatments.	Two 10-foot-wide sidewalks/shared-use paths would accommodate bi-directional pedestrian traffic and one-way bicycle traffic. 5-foot-wide shoulders on the bridge structure could be used as bicycle lanes, but with minimal “shy distance.”

Alternative C	Alternative D	Alternative E	Preferred Alternative (Alternative D Refined)
<p>Bicyclists and pedestrians on lower bridge deck eliminates conflicts with vehicles on bridge and in the west-side interchange. Security concerns because of complete separation from other bridge users.</p> <p>None.</p>	<p>Potential conflicts with motorists making turning movements in west-side interchange area, but better and safer bicyclist and pedestrian crossings than the No Build Alternative.</p> <p>None.</p>	<p>Potential conflicts with motorists making turning movements in west-side interchange area, but better and safer bicyclist and pedestrian crossings than the No Build Alternative.</p> <p>Lack of south spiral ramp on west-side creates circuitous routing for some users.</p>	<p>Potential conflicts with motorists making turning movements in west-side interchange area, but better and safer bicyclist and pedestrian crossings than the No Build Alternative.</p> <p>None.</p>
<p>Accommodates bi-directional traffic on a 20-foot-wide shared-use path on lower bridge deck.</p>	<p>Two 12-foot-wide sidewalks/shared use paths would accommodate bi-directional pedestrians and bicyclists</p> <p>6.5-foot-wide on-street bicycle lanes in each direction.</p>	<p>8-foot-wide south shared-use path would accommodate one-way eastbound bicycle traffic and two-way pedestrian traffic.</p> <p>16-foot-wide north shared used path would accommodate bi-directional traffic</p>	<p>Two 12-foot-wide sidewalks/shared use paths would accommodate bi-directional pedestrians and bicyclists</p> <p>6.5-foot-wide on-street bicycle lanes in each direction.</p>

**TABLE S-3, Cont.**

**Summary of Anticipated Impacts of the No Build Alternative and the Build Alternatives**

Discipline	Element	No Build Alternative	Alternative A	Alternative B and Alternative B with Temporary Detour Bridge (if different from Alt. B)
3.3 Right-of-Way and Relocation	Total land area acquired for right-of-way	0 acres	10.5 acres	10.5 acres 10.8 acres
	Number of displaced residential condominiums units	0 units	1 unit	1 unit
	Number of displaced businesses	0 businesses	9 businesses (The viability of these businesses is not dependent on their specific locations)	9 businesses (The viability of these businesses is not dependent on their specific locations) 10 businesses (The viability of these businesses is not dependent on their specific locations)
	Right-of-way cost (included in total construction cost)	\$0	\$15.8 million	\$15.8 million \$17.1 million
3.4 Utilities	Utility relocation cost	\$0.14 million	\$2.87 million	\$3.20 million \$4.60 million
3.5 Land Use	Consistent with all applicable regulations, plans, and guidance documents?	Yes	Yes	Yes

Alternative C	Alternative D	Alternative E	Preferred Alternative (Alternative D Refined)
10.8 acres	10.7 acres	11.6 acres	8.9 acres
1 unit	5 units	6 units	5 units
10 businesses (The viability of these businesses is not dependent on their specific locations)	9 businesses (The viability of these businesses is not dependent on their specific locations)	48 businesses (The viability of these businesses is not dependent on their specific locations)	9 businesses (The viability of these businesses is not dependent on their specific locations)
\$20.9 million	\$25.8 million	\$35.7 million	\$27.0 million
\$3.19 million	\$3.28 million	\$3.61 million	\$3.28 million
No (More than two through lanes on bridge; inconsistent with <i>South Willamette River Crossing Study</i> ). Two through lanes merge to one lane eastbound before the SE 6th Avenue intersection.	Yes	No (Bridge crosses a designated view corridor on SE Spokane Street in the <i>City of Portland Comprehensive Plan</i> [City of Portland, 2006])	Yes

**TABLE S-3, Cont.**  
**Summary of Anticipated Impacts of the No Build Alternative and the Build Alternatives**

Discipline	Element	No Build Alternative	Alternative A	Alternative B and Alternative B with Temporary Detour Bridge (if different from Alt. B)
3.6 Economic	Employees displaced	0 employees	30 employees	30 employees 62 employees
	Construction costs (2012 million dollars)	\$54 million (for maintenance activities)	\$331 million (stress-ribbon bike/ped bridge) \$337 million (cable-stayed bike/ped bridge)	\$326 million \$356 million
	Construction duration	12 months	36 months	36 months 39 months
	Bridge closure during construction	6 to 8 months (for maintenance activities)	24 months	24 months No closure
	Travel time and vehicle operating cost of bridge closure	\$19.1 million	\$63.3 million	\$63.3 million No closure
	Owner and labor income losses because of bridge closure	\$1.9 to \$4.9 million	\$3.8 to \$9.8 million	\$3.8 to 9.8 million No closure

Alternative C	Alternative D	Alternative E	Preferred Alternative (Alternative D Refined)
46 employees	30 employees	216 employees	30 employees
\$280 million	\$293 million (delta-frame bridge) \$311 million (deck-arch bridge)	\$281 million (box-girder bridge) \$361 million (through-arch bridge)	\$290 million (delta-frame bridge) \$299 million (deck-arch bridge)
42 months	51 months (deck-arch) 45 months (delta-frame)	36 months (box-girder) 42 months (through-arch)	51 months
42 months	No long-term closure; interim closures to replace the existing bridge and construct the new bridge	No closure	No long-term closure; interim closures to replace the existing bridge and construct the new bridge
\$110.8 million	No long-term closure; interim closures to replace the existing bridge and construct the new bridge	No closure	No long-term closure; interim closures to replace the existing bridge and construct the new bridge
\$6.7 to 17.0 million	No long-term closure; interim closures to replace the existing bridge and construct the new bridge	No closure	No long-term closure; interim closures to replace the existing bridge and construct the new bridge

**TABLE S-3, Cont.**  
**Summary of Anticipated Impacts of the No Build Alternative and the Build Alternatives**

Discipline	Element	No Build Alternative	Alternative A	Alternative B and Alternative B with Temporary Detour Bridge (if different from Alt. B)
3.7 Social Elements	Potential increase in neighborhood cut-through traffic (to avoid SE Tacoma Street)	None to Minimal (Same intersection configuration as existing at SE 6th Avenue/SE Tacoma Street intersection)	None to Minimal (Same intersection configuration as existing at SE 6th Avenue/SE Tacoma Street intersection)	None to Minimal (Same intersection configuration as existing at SE 6th Avenue/SE Tacoma Street intersection)
	Emergency services – provides river crossing during construction?	No (6 to 8-month closure)	No (24-month closure)	No (24-month closure) <i>Temporary detour bridge would maintain river crossing</i>
	Community facility impact – access to businesses	Access limitation for west-side customers (during 6-8 month closure)	Access limitation for west-side customers (during 24-month closure)	Access limitation for west-side customers (during 24-month closure); <i>No impact with temporary detour bridge</i>
	Access to River View Cemetery and funeral home	No change; access provided through a signalized intersection with OR 43.	Modified access from OR 43, provided through the new west-side interchange; access maintained during construction	Modified access from OR 43 through the interchange; access maintained during construction
3.8 Environmental Justice	Impact to environmental justice populations	No change	No disproportionately high and adverse effects on environmental justice populations	No disproportionately high and adverse effects on environmental justice populations
3.9 Parks and Recreation	Total parkland acres converted	0 acres	4.3 acres	3.9 acres

Alternative C	Alternative D	Alternative E	Preferred Alternative (Alternative D Refined)
Minimal to Moderate (Eastbound left-turn restricted; right-turn loop under bridge from SE Tacoma Street to SE 6th Avenue could encourage cut-through traffic)	Moderate to Substantial (Signalized intersection at SE 6th Avenue/SE Tacoma Street allows for dedicated turning movements)	Moderate to Substantial (Signalized intersection at SE 6th Avenue/SE Tacoma Street allows for dedicated turning movements)	None to Minimal (Same intersection configuration as existing at SE 6th Avenue/SE Tacoma Street intersection, except with a bicyclist/pedestrian-activated signal)
No (42-month closure)	Yes (except for interim closures to replace the existing bridge and construct the new bridge)	Yes	Yes (except for interim closures to replace the existing bridge and construct the new bridge)
Access limitation for west-side customers (during 42-month closure)	None (except interim access limitation for west-side customers to replace the existing bridge and construct the new bridge)	None	None (except interim access limitation for west-side customers to replace the existing bridge and construct the new bridge)
Removal of access from OR 43 Access from SW Taylors Ferry Road and circuitous route through cemetery. Customers would have difficulty finding the funeral home.	Modified access from OR 43 through the new interchange; access maintained during construction	Modified access from OR 43 through the new interchange; access maintained during construction	Modified access from OR 43 through the new interchange; access maintained during construction
No disproportionately high and adverse effects on environmental justice populations	No disproportionately high and adverse effects on environmental justice populations	No disproportionately high and adverse effects on environmental justice populations	No disproportionately high and adverse effects on environmental justice populations
4.3 acres	3.9 acres	3.8 acres	1.4 acres

**TABLE S-3, Cont.**  
**Summary of Anticipated Impacts of the No Build Alternative and the Build Alternatives**

Discipline	Element	No Build Alternative	Alternative A	Alternative B and Alternative B with Temporary Detour Bridge (if different from Alt. B)
	Number of park/recreational facilities impacted	1 facility (Sellwood Bridge Recreational Trail)	8 facilities (Sellwood Riverfront Park, Oaks Pioneer Park, Powers Marine Park, Willamette Moorage Park, Springwater Corridor Trail, Willamette Greenway Trail [East Bank], Willamette Greenway Trail [West Bank], Sellwood Bridge Recreational Trail)	6 facilities (Powers Marine Park, Willamette Moorage Park, Springwater Corridor Trail, Willamette Greenway Trail [East Bank], Willamette Greenway Trail [West Bank], Sellwood Bridge Recreational Trail)  6 facilities (Oaks Pioneer Park and all the above except Sellwood Bridge Recreational Trail)
3.10 Archaeological and Historic Resources	Adverse impacts to River View Cemetery?	No	Yes, adversely alters the setting of a historic resource	Yes, adversely alters the setting of a historic resource
	Adverse impacts to cemetery's Superintendent's House?	No	Yes, adversely alters the setting of a historic resource	Yes, adversely alters the setting of a historic resource
	Adverse impacts to Sellwood Bridge?	Yes, Bridge deteriorates	Yes, Bridge significantly altered, no longer eligible for the National Register of Historic Places	Yes Bridge significantly altered, no longer eligible for the National Register of Historic Places
3.11 Visual Resources	Presence of retaining walls 10 feet or higher in lineal feet (OR 43 southbound exit ramp)	0 lineal feet	930 lineal feet	580 lineal feet
	Presence of retaining walls 10 feet or higher in lineal feet (OR 43 southbound entrance ramp)	0 lineal feet	600 lineal feet	600 lineal feet

Alternative C	Alternative D	Alternative E	Preferred Alternative (Alternative D Refined)
7 facilities (Powers Marine Park, Willamette Moorage Park, Springwater Corridor Trail, Willamette Greenway Trail [East Bank], Willamette Greenway Trail [West Bank], Sellwood Bridge Recreational Trail, Willamette Greenway Trail [SE Spokane Street Section])	6 facilities (Powers Marine Park, Willamette Moorage Park, Springwater Corridor Trail, Willamette Greenway Trail [East Bank], Willamette Greenway Trail [West Bank], Willamette Greenway Trail [SE Spokane Street Section])	7 facilities (Oaks Pioneer Park, Powers Marine Park, Willamette Moorage Park, Springwater Corridor Trail, Willamette Greenway Trail [East Bank], Willamette Greenway Trail [West Bank], Willamette Greenway Trail [SE Spokane Street Section])	5 facilities (Powers Marine Park, Willamette Moorage Park, Springwater Corridor Trail, Willamette Greenway Trail [East Bank], Willamette Greenway Trail [West Bank])
Yes, adversely alters the setting of a historic resource	Yes, adversely alters the setting of a historic resource	Yes, adversely alters the setting of a historic resource	Yes, adversely alters the setting of a historic resource
Yes, adversely alters the setting of a historic resource	Yes, adversely alters the setting of a historic resource	Yes, adversely alters the setting of a historic resource	Yes, adversely alters the setting of a historic resource
Yes Bridge replaced	Yes, Bridge replaced	Yes, Bridge replaced	Yes, Bridge replaced
400 lineal feet	660 lineal feet	800 lineal feet	750 lineal feet
450 lineal feet	650 lineal feet	950 lineal feet	1,200 lineal feet

**TABLE S-3, Cont.**

**Summary of Anticipated Impacts of the No Build Alternative and the Build Alternatives**

Discipline	Element	No Build Alternative	Alternative A	Alternative B and Alternative B with Temporary Detour Bridge (if different from Alt. B)
	Significant east-side visual change?	No	Yes (new bicyclist/pedestrian bridge)	No
	Significant west-side visual change?	No	Yes	Yes
3.12 Geology	Maximum fill height	0 feet	36 feet	21 feet
	Maximum cut height	0 feet	49 feet	38 feet
	Fill height in Sellwood landslide	0 feet	0 feet	0 feet
	Cut height in Sellwood landslide	0 feet	18 feet	18 feet
3.13 Water Resources and Water Quality	Impervious surface area	7.0 acres (None treated)	13.7 acres (96% increase from existing condition; all stormwater treated)	13.8 acres (97% increase from existing condition; all stormwater treated)
	Improves water quality compared to existing conditions?	No	Yes	Yes

Alternative C	Alternative D	Alternative E	Preferred Alternative (Alternative D Refined)
No	No	Yes (bridge on new alignment)	No
Yes	Yes	Yes	Yes
38 feet	28 feet	30 feet	20 feet
65 feet	41 feet	57 feet	73 feet
12 feet	28 feet	10 feet	6 feet
0 feet	18 feet	8 feet	43 feet
12.6 acres (80% increase from existing condition; all stormwater treated)	13.9 acres (98% increase from existing condition; all stormwater treated)	13.6 acres (94% increase from existing condition; all stormwater treated)	13.9 acres (98% increase from existing condition; all stormwater treated)
Yes	Yes	Yes	Yes

**TABLE S-3, Cont.**

**Summary of Anticipated Impacts of the No Build Alternative and the Build Alternatives**

Discipline	Element	No Build Alternative	Alternative A	Alternative B and Alternative B with Temporary Detour Bridge (if different from Alt. B)
3.14 Hydraulics	100-year base flood elevation	33.91 feet	0.06 foot higher than No Build Alternative (cable-stayed bike/ped bridge) 0.07 foot higher than No Build Alternative (stress-ribbon bike/ped bridge) Would require design change or regulated floodway modification.	0.03 foot higher than No Build Alternative Would require design change or regulated floodway modification. <i>2.81 feet higher than No Build Alternative during construction.</i>
	Maximum average water velocity at bridge	7.33 feet per second	3.5% faster than No Build Alternative (cable-stayed and stress-ribbon bike/ped bridge)	3.7% faster than No Build Alternative <i>13.6% faster than No Build Alternative during construction</i>
3.15 Aquatic Resources	Overall Aquatic Resources Sensitivity Score (the higher the score, the lower the overall impacts)	Not applicable	2.0 (stress-ribbon bike/ped bridge) 2.4 (cable-stayed bike/ped bridge)	2.6
3.16 Vegetation	Area of Lowland Conifer-Hardwood Forest removed	0 acres	9.6 acres	9.4 acres
	Area of Westside Riparian habitat removed	0 acres	0.5 acre	0.6 acre <i>0.7 acre</i>
	Area of noxious weeds removed	0 acres	0.1 acre	0.1 acre

Alternative C	Alternative D	Alternative E	Preferred Alternative (Alternative D Refined)
0.02 foot higher than No Build Alternative Would require design change or regulated floodway modification.	Same as No Build Alternative (deck-arch bridge) 0.02 foot lower than No Build Alternative (delta-frame bridge)	0.02 foot higher than No Build Alternative (box-girder and through-arch bridge) Would require design change or regulated floodway modification.	Up to 0.08 foot higher than No Build Alternative (deck-arch and delta-frame bridges)
2.3% faster than No Build Alternative	Same as No Build Alternative (deck-arch bridge) 2.6% slower than No Build Alternative (delta-frame bridge)	3.1% faster than No Build Alternative (box-girder bridge) 2.3% faster than No Build Alternative (through-arch bridge)	Up to 0.56 feet per second slower than No Build Alternative
3.5	1.5 (deck-arch bridge) 2.6 (delta-frame bridge)	2.5 (through-arch bridge) 4.7 (box-girder bridge)	3.6
8.8 acres	9.4 acres	9.8 acres	12.2 acres
0.5 acre	0.6 acre	0.5 acre	0.5 acre
0.3 acre	0.2 acre	0.1 acre	0.2 acre

**TABLE S-3, Cont.**

**Summary of Anticipated Impacts of the No Build Alternative and the Build Alternatives**

Discipline	Element	No Build Alternative	Alternative A	Alternative B and Alternative B with Temporary Detour Bridge (if different from Alt. B)
3.17 Wetlands	Disturbed acres of wetland	0 acres	0.1 acre	0.1 acre
3.18 Wildlife Habitat	Disturbed acres of wildlife habitat	0 acres	11.2 acres	10.9 acres <i>11.2 acres</i>
3.19 Noise	Number of residences impacted (noise level of 65 decibels or higher)	24 residences	18 residences	20 residences <i>16 residences</i>
	Impacts to interior of Oaks Pioneer Church? (That is, noise level 50 decibels or higher when doors and windows are open)	Yes 50 decibels	Yes 50 decibels	No 49 decibels Yes <i>54 decibels, during construction</i>
	Number of businesses impacted (noise level of 70 decibels or higher)	1 business	1 business	1 business
	Noise level increase from existing conditions	Up to 2 decibels	Up to 1 decibel	Up to 1 decibel <i>Up to 5 decibels</i>

Alternative C	Alternative D	Alternative E	Preferred Alternative (Alternative D Refined)
0.1 acre	0.1 acre	0.1 acre	None
10.0 acres	11.2 acres	10.9 acres	11.7 acres
18 residences	18 residences	16 residences	18 residences
Yes 50 decibels	Yes 50 decibels	Yes 51 decibels	Yes 50 decibels
1 business	1 business	1 business	1 business
Up to 1 decibel	Up to 3 decibels	Up to 2 decibels	Up to 3 decibels

**TABLE S-3, Cont.**  
**Summary of Anticipated Impacts of the No Build Alternative and the Build Alternatives**

Discipline	Element	No Build Alternative	Alternative A	Alternative B and Alternative B with Temporary Detour Bridge (if different from Alt. B)
3.20 Energy	Energy used during construction	182,000 million British thermal units (Btu)	834,800 million Btu (cable-stayed bike/ped bridge)  817,000 million Btu (stress-ribbon bike/ped bridge)	808,100 million Btu  888,000 million Btu
	Energy used during operation (annual)	1,666 million Btu	2,177 million Btu	2,177 million Btu
3.21 Air Quality	Carbon monoxide emissions in parts per million over an 8-hour period	3.9 parts per million (meets applicable standard)	3.9 parts per million (meets applicable standard)	3.9 parts per million (meets applicable standard)
3.22 Hazardous Materials	Number of potentially hazardous sites directly impacted	0 sites	7 sites	6 sites 7 sites

Alternative C	Alternative D	Alternative E	Preferred Alternative (Alternative D Refined)
688,200 million Btu	759,300 million Btu (deck-arch bridge) 706,000 million Btu (delta-frame bridge)	634,900 million Btu (box-girder bridge) 852,500 million Btu (through-arch bridge)	714,800 million Btu (deck-arch bridge) 692,600 million Btu (delta-frame bridge)
2,177 million Btu	2,177 million Btu	2,177 million Btu	2,177 million Btu
3.9 parts per million (meets applicable standard)	3.9 parts per million (meets applicable standard)	3.9 parts per million (meets applicable standard)	3.9 parts per million (meets applicable standard)
10 sites	6 sites	7 sites	6 sites

**TABLE S-4**  
**Areas of Controversy and Resolution**

Issue/Theme	Resolution
Build a new bridge in another corridor	Metro’s 1999 <i>South Willamette River Crossing Study</i> concluded that improvements were needed to the existing Sellwood Bridge or the existing bridge would need to be rebuilt in the existing east-west corridor. Additional project studies confirmed that the assumptions of this study are still valid.
Neighborhood livability in Sellwood	The community linked livability to maintaining two travel lanes on the bridge, making bridge improvements compatible with the <i>Tacoma Main Street Plan</i> (City of Portland, 2001), and reducing commuter and neighborhood cut-through traffic impacts. In this FEIS, Alternatives A, B, D, and D Refined are two-lane options for a new or rehabilitated bridge. Alternative A also features a narrow cross-section width (39 feet) to reduce right-of-way impacts. Alternative C is a three-lane bridge. Alternative E includes four lanes, but two are limited to transit vehicles.
Neighborhood cut-through traffic	The No Build Alternative would maintain existing conditions on SE Tacoma Street east of the bridge. The Build alternatives include four different options for the intersection of SE Tacoma Street and SE 6th Avenue—existing conditions, a right-turn loop under the bridge, a signal, and a bicyclist/pedestrian-activated signal—that would have different effects on neighborhood cut-through traffic analyzed in this FEIS.
Consistency with the policies, goals, and objectives in the <i>Tacoma Main Street Plan</i> (City of Portland, 2001)	The adopted Tacoma Main Street Plan (City of Portland, 2001) and other approved planning documents call for two travel lanes on the Sellwood Bridge and two travel lanes on SE Tacoma Street. Alternatives A, B, D, E, and D Refined would include two travel lanes on the Sellwood Bridge. Alternative E would include two additional lanes limited to transit use. Alternative C would include three travel lanes (one lane westbound and two eastbound). The No Build Alternative and the Build alternatives would maintain two travel lanes on SE Tacoma Street.
Private property impacts	Property impact evaluation criteria were included in the evaluation framework to screen the range of alternatives. Multnomah County communicated and coordinated with private property owners in the area to minimize private property impacts throughout this phase of the project.
Residential and business impacts	Residential and business impact evaluation criteria were included in the evaluation framework to screen the range of alternatives.

**TABLE S-4**  
**Areas of Controversy and Resolution**

Issue/Theme	Resolution
Route a new bridge to the north to reduce residential impacts	The project team developed and analyzed three alignments to the north of the existing alignment to address public comments. Alternative E, a northern alignment that would minimize impacts to the residential units immediately north and south of the existing bridge, is analyzed in the DEIS and this FEIS.
Bicycle and pedestrian access and connections to area trails	The Build alternatives include wider facilities for bicyclists and pedestrians and improve connections to the trail facilities on the east and west sides of the river. The No Build Alternative would maintain existing bicycle and pedestrian facilities.
Build for the long-term future and ensure adequate bridge capacity for all users	The 2035 traffic demands in the study area are estimated to be similar under the No Build Alternative and each of the Build alternatives because none of the Build alternatives would increase vehicle-traffic-carrying capacity along OR 43 beyond the immediate area of the bridge or along SE Tacoma Street east of the bridge. However, the Build alternatives would provide substantially increased person-throughput in the project corridor because the Build alternatives could serve mass transit and dramatically increase bicyclist and pedestrian trips. Alternatives with two travel lanes (Alternatives A, B, D, and D Refined) and three travel lanes (Alternative C) are analyzed in this FEIS to evaluate the tradeoffs (benefits and impacts) of the number of travel lanes on the bridge. Alternative E includes four lanes, but two are dedicated transit lanes. Because only transit vehicles would be allowed to use these lanes, Alternative E is categorized as a two-lane bridge. No alternatives consider four travel lanes for automobiles and trucks.
Bus transit on the bridge and/or future streetcar	Each of the Build alternatives would restore TriMet bus service across the Sellwood Bridge and would include building the bridge strong enough to accommodate streetcar transit in the future, if this mode is pursued. The existing 10-ton weight restriction would continue under the No Build Alternative, precluding buses and streetcars from crossing the bridge.
Accommodate large vehicles, including transit, trucks, and emergency vehicles	The Build alternatives would meet applicable geometric roadway design standards to safely accommodate various vehicle types (including transit vehicles, trucks, and emergency vehicles) in the Sellwood Bridge/OR 43 interchange on the west side and on the bridge. The No Build Alternative would not improve geometric roadway deficiencies or remove the 10-ton weight restriction that precludes large vehicles from crossing the bridge.

**TABLE S-4**  
**Areas of Controversy and Resolution**

Issue/Theme	Resolution
Structural integrity for large vehicles and seismic events	Providing structural integrity to accommodate safely various vehicle types (including transit vehicles, trucks, and emergency vehicles) and to withstand moderate seismic events was included as a threshold criterion and as an evaluation criterion in the evaluation framework. All Build alternatives would meet current seismic design standards and have a design life of 75 years. The No Build Alternative, which is designed for a 20-year design life, would not meet these design standards.
Bridge approach and interchange safety	A geometrically functional and safe roadway design was included as a threshold criterion in the evaluation framework. The Build alternatives would improve the bridge approaches to meet current engineering design standards. The No Build Alternative would not improve the geometric deficiencies of the Sellwood Bridge/OR 43 interchange on the west side.
West-side landslide	The No Build Alternative would rebuild the west-side bridge approach with drilled shafts, which could help to stabilize the existing landslide in the area. The Build alternatives would include mitigation measures to improve stability of the existing landslide.
Bridge closure during construction	Traffic across the river during construction would be maintained under Alternatives D, E, and D Refined, except for interim closures to replace the existing bridge and construct the new bridge under Alternatives D and D Refined. Alternative B includes the option of a temporary detour bridge during construction. Traffic across the river would not be maintained during maintenance activities under the No Build Alternative and during construction activities under Build Alternatives A, B (without the temporary detour bridge), and C.
Funding to construct bridge improvements	Multnomah County has identified a preliminary financial plan to fund construction of the Sellwood Bridge project from various funding sources. Multnomah County would not be able to move ahead with construction until future project phases are included in the financially constrained Regional Transportation Plan (anticipated to be adopted by Metro in June 2010), and a Financial Plan demonstrating how the project would be funded is developed and approved by FHWA.
Recreational facility impacts	Recreational facility impacts were included in the evaluation framework to screen the range of alternatives. Recreational facility impacts were also extensively analyzed in the Final Section 4(f) Evaluation (appended to this FEIS).

**TABLE S-4**  
**Areas of Controversy and Resolution**

Issue/Theme	Resolution
Historic resource impacts	Historic resource impact evaluation criteria were included in the evaluation framework to screen the range of alternatives. On the west side, the Build alternatives were designed to minimize impacts to River View Cemetery and the Superintendent’s House. The Build alternatives would avoid direct impacts to Oaks Pioneer Church. All Build alternatives, including the rehabilitation alternatives, would adversely affect the historic status of the Sellwood Bridge. The No Build Alternative would not impact historic resources.
Natural environment impacts, including riparian vegetation, fish, water quality, and wetlands	Natural environment evaluation criteria were included in the evaluation framework to screen the range of alternatives. Water quality, hydraulics, aquatic resources, vegetation, wetlands, and wildlife are addressed in this FEIS.
River users and navigation	The No Build Alternative and the Build alternatives would maintain or improve the existing vertical clearance between the Willamette River and the bottom of the bridge.
Bridge aesthetics and visual impacts	Aesthetic evaluation criteria were included in the evaluation framework to screen the range of alternatives. The public commented on proposed bridge types through an online survey in November 2007.
Include all of SE Tacoma Street in the project	This project is aimed at developing a solution to the structurally deficient Sellwood Bridge (owned and maintained by Multnomah County) and its interconnection with OR 43 (owned by ODOT). Because SE Tacoma Street (owned and maintained by the City of Portland) is not part of the bridge structure, it is out of scope for this project. Improvements on SE Tacoma Street for any of the Build alternatives would include the necessary transition and approach work to match with the new or rehabilitated Sellwood Bridge.

**TABLE S-5**  
**Other Federal, State, and Local Actions Required**

Agency	Regulation or Approval
Federal Highway Administration	Section 4(f) of the U.S. Department of Transportation Act of 1966
National Park Service	Section 6(f) of the Land and Water Conservation Act (Alternative A only)
U.S. Army Corps of Engineers/Oregon Department of State Lands	Clean Water Act, Section 404
U.S. Army Corps of Engineers/Oregon Department of State Lands	Oregon's Removal-Fill Law
U.S. Army Corps of Engineers/Oregon Department of State Lands	Section 10 of the Rivers and Harbors Act
U.S. Coast Guard	Section 9 of the Rivers and Harbors Act
National Marine Fisheries Service	Section 7 of the Endangered Species Act Consultation; Biological Opinion
U.S. Fish and Wildlife Service/National Marine Fisheries Service	Fish and Wildlife Coordination Act
U.S. Fish and Wildlife Service/National Marine Fisheries Service	Magnuson-Stevens Fishery Conservation and Management Act
U.S. Fish and Wildlife Service/National Marine Fisheries Service	Migratory Bird Treaty Act
Oregon Department of Agriculture	Oregon Endangered Species Act (Plants)
Oregon Department of Environmental Quality	Clean Water Act Section 401: Water Quality Certification
Oregon Department of Environmental Quality	Clean Water Act Section 402: National Pollutant Discharge Elimination System (NPDES) Program
Oregon Department of Environmental Quality	Clean Water Act Section 402: NPDES Municipal Separate Storm Sewer System (MS4) Program
Oregon Department of Environmental Quality	Conformance with Oregon Department of Environmental Quality's National Ambient Air Quality Standards
Oregon Department of Fish and Wildlife	Oregon Endangered Species Act (Wildlife)
Oregon Department of Fish and Wildlife	Fish Passage Plan Approval (Oregon Administrative Rule [OAR] 635-012)
Oregon Department of Transportation	Access spacing deviation (OAR 734-051)
Oregon State Marine Board	Recreational Waters Coordination Requirements
State Historic Preservation Office	Section 106 Consultation, National Historic Preservation Act
City of Portland	Floodplain Development Permit
City of Portland	Type II Greenway Permit

**TABLE S-5**  
**Other Federal, State, and Local Actions Required**

Agency	Regulation or Approval
City of Portland	Type II Environmental Permit
City of Portland	Type II Historic Design Review
City of Portland	Conditional Use Permit
City of Portland	Non Park Use Permit
City of Portland	Noise Ordinance Variance
City of Portland	Harbor Master Permit

## Major Actions Proposed by Other Governmental Agencies

Currently, the Willamette Shoreline Trolley operates on tracks that are immediately east of the existing west-side interchange and parallel to OR 43. All Build alternatives would require moving the railroad right-of-way eastward into Powers Marine Park and toward the Staff Jennings property (a former commercial boat dealership

north of the existing bridge that closed in March 2010). The existing rail facility is a single track. However, current planning is for a streetcar with a second track in this area and space for the Willamette Greenway Trail (West Bank) along the tracks. The ground level slopes steeply down to the river east of OR 43. Therefore, moving the rail tracks to the east would require placing them on fill or structure and building a retaining wall to support the fill and minimize encroachment into the park. The replacement right-of-way provided and presented in this FEIS would replace the



*Thousands of public comments were received throughout the public involvement process.*

existing right-of-way. The cost included in this project is for the replacement of existing right-of-way; the track replacement; any fill or structure required; and the construction of any necessary retaining walls.

Major actions proposed by other governmental agencies have been taken into account and are consistent with the Build alternatives. These actions include:

- Provision of light rail transit service on Oregon 99E (Portland—Milwaukie Light Rail Project)
- Multi-modal improvements to Oregon 99E between the Ross Island Bridge and Milwaukie
- Multi-modal improvements to SE Tacoma Street between the Sellwood Bridge and Oregon 99E
- Improvements to the Willamette Greenway Trail (West Bank) between the Sellwood Bridge and Portland city limits

- Provision of Intelligent Transportation System (ITS) enhancements on OR 43 between Sellwood Bridge and SW Hood Street/ SW Bancroft Street
- Construction of bicyclist and pedestrian improvements on SW Taylors Ferry Road between SW 35th Street and OR 43
- Provision of ITS enhancements to four traffic signals on SE Tacoma Street between the Sellwood Bridge and SE 45th Street
- Construction of a shared-use path segment to complete the Springwater Corridor Trail between SE Umatilla Street and SE 19th Avenue at SE Ochoco Street
- Improvements to the SE Spokane Street and SE Umatilla Street bicycle boulevards

The City of Portland identifies the OR 43 (SW Macadam Avenue) corridor and the Sellwood Bridge as streetcar transit corridors in the *Portland Streetcar System Concept Plan* (City of Portland Bureau of Transportation, 2009). Although a streetcar project on the Sellwood



**The existing Sellwood Bridge.**

Bridge is not a formal project at this time, Alternative D Refined has been designed to accommodate a future streetcar project in this location.

## Appendixes in this FEIS

The following appendixes provide supporting information to this FEIS:

Appendix A – Acronyms and Abbreviations

Appendix B – References

Appendix C – List of Preparers

Appendix D – List of Supporting Technical Documentation

Appendix E – Distribution and Notice of Availability Lists

Appendix F – Summary of Permits and Clearances Needed

Appendix G – Summary of Mitigation and Environmental Commitments

Appendix H – SHPO FOE Concurrence Letter

Appendix I – Responses to DEIS Comments

Appendix J – Original Comments on the DEIS

Appendix K – Index

