

This Draft Environmental Impact Statement (DEIS) 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—Multnomah County, the Federal Highway Administration (FHWA), and the Oregon Department of Transportation (ODOT). This DEIS, which was prepared following FHWA’s environmental process and guidelines for preparing a DEIS, complies with FHWA NEPA regulations. FHWA will be the final approver of this document.

A public comment period and a public hearing will be held following distribution of this DEIS. The Policy Advisory Group, defined later in this summary, will identify a locally preferred alternative after considering the analysis documented in this DEIS, input from the project’s advisory groups, and public comments. The Multnomah County Board of Commissioners, Clackamas County Board of Commissioners, Metro’s Joint Policy Advisory Committee on Transportation (JPACT), Metro Council, Portland City Council, ODOT, and FHWA must approve this locally preferred alternative.

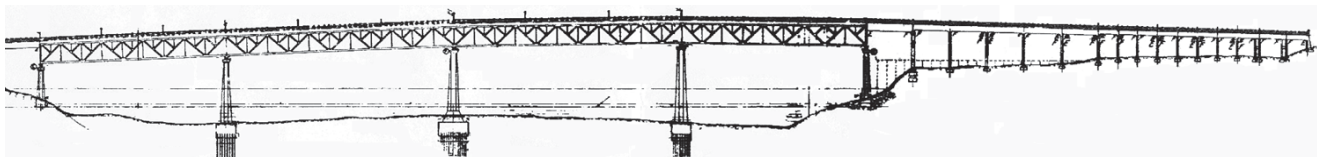
A final environmental impact statement (FEIS) will evaluate the social and natural environmental effects of the preferred alternative. Following distribution of the FEIS, a second public comment period will begin. If the comments received can be satisfied within the context of the preferred alternative, FHWA will issue a Record of Decision approving the preferred alternative. This approval, and a Financial Plan demonstrating how the project will

be funded, would allow Multnomah County to move ahead with the project.

Description of the Proposed Action

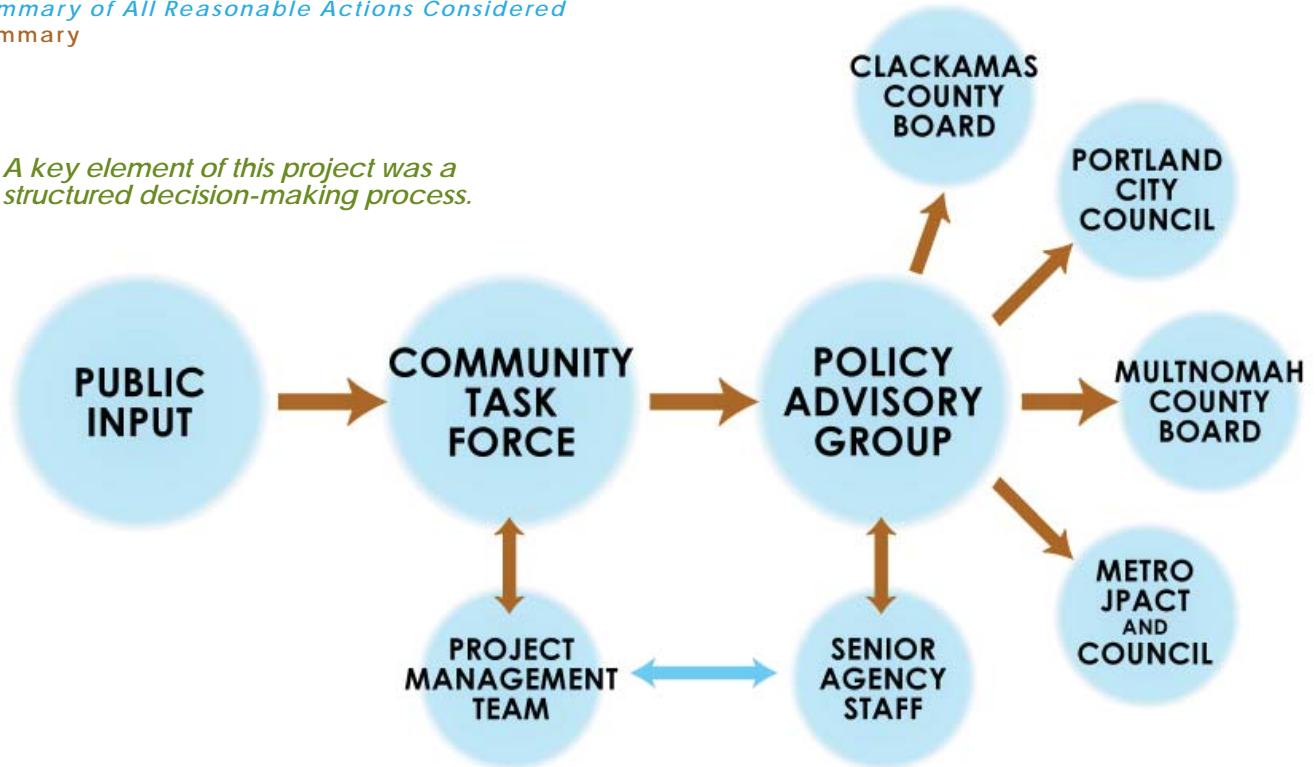
The Sellwood Bridge project would rehabilitate or replace the Sellwood Bridge located in Portland, Multnomah County, Oregon. After more than 80 years, the Sellwood Bridge has reached the end of its useful service life. The bridge was constructed in 1925 to replace the Spokane Street Ferry, which shuttled 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 Highway 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:

- 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



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

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



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, a structured decision-making process was established at the outset. 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:

- **Policy Advisory Group (PAG).** Makes decisions at each decision point and is comprised of elected and appointed officials of local agencies and jurisdictions with regulatory responsibility for the project or those who have strong interest in the outcome.
- **Community Task Force (CTF).** Makes recommendations to the PAG at each decision point and is comprised of representatives from neighborhoods, 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.

- **Project Management Team (PMT).** Guides the day-to-day execution of the project and includes staff from Multnomah County, Metro, City of Portland, ODOT, FHWA, and the consulting team.
- **Senior Agency Staff (SAS).** Advises the PMT and the PAG. The SAS is comprised of senior level staff from each of the PAG member organizations.
- **Working Groups.** Provide input to the CTF and PMT on particular issues. Each group is comprised of consultants, agency staff, and experts who have volunteered their services.

Chapter 5 of the DEIS describes the composition, roles, and responsibilities of these five groups in more detail. While these groups provide input and are involved in identifying a preferred alternative, FHWA ultimately selects the preferred alternative.

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 process and about the roles, responsibilities, and membership of the various project groups (PAG, CTF, PMT, and SAS).
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, created a method for assessing and comparing alternatives—the evaluation framework. The 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.
4. **Develop Alternatives.** The fourth major decision point, conducted in the spring of 2007, developed the range of alternatives. The aim of this step was to ensure that the stakeholders were consulted and their ideas were considered. Alternatives consisted of the following three elements:
 - **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. Ten interchange/intersection-type concepts were developed by the project team 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 bridge cross-section concepts were developed.
5. **Screen Alternatives.** The fifth major decision point, conducted in the summer of 2007, identified alternatives for analysis in this Draft Environmental Impact Statement (DEIS). The feasible concepts (alignments, interchange types, and bridge cross-sections) were combined to form project alternatives. The various combinations of alignments, cross-



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

sections, and interchange types produced over 100 unique alternatives for evaluation. Next, the CTF and PAG identified five alternatives to be carried forward for additional analysis in this DEIS.

- 6. Identify Preferred Alternative.** The project is currently at the sixth and final major decision point, identification of the preferred alternative.

The first five major decision points, already completed, featured public involvement activities that included the following elements: briefings, newsletters, open houses, an interactive project Web site, online surveys, and a speakers' bureau. The sixth decision point will also include similar elements.

Lead, Cooperating, and Participating Agencies

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) law authorizes federal surface transportation programs through fiscal year 2009. Section 6002 of SAFETEA-LU created consolidated and enhanced environmental streamlining regulations. It requires transportation agencies to work together with natural, cultural, and historic resource agencies 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 has been afforded the opportunity to comment at each of the five decision points in the project.

Alternatives Evaluated in the DEIS

This DEIS evaluates a No Build Alternative and five 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 condition as possible for the next 20 years.

The Build alternatives, lettered A through E (Table S-2), were assembled from compatible combinations of alignments, bridge cross-sections, bridge types, and interchange types. These features

Table S-1. *Cooperating and Participating Agencies.*

Federal Agencies	
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)
State Agencies	
Oregon Department of Environmental Quality (p)	Oregon Department of Land Conservation and Development (p)
Oregon Department of Fish and Wildlife (p)	Oregon State Historic Preservation Office (p)
Oregon Division of State Lands (p)	
Tribes and Local Agencies	
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

Table S-2. Build Alternative Characteristics.

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

Table S-2, cont. Build Alternative Characteristics.

Alternative	A	B	C	D	E
East-side Intersection	<ul style="list-style-type: none"> Same as existing (eastbound left turn permitted at SE 6th Avenue) 	<ul style="list-style-type: none"> Same as existing (eastbound left turn permitted at SE 6th Avenue) 	<ul style="list-style-type: none"> Eastbound left turn to SE 6th Avenue restricted Right turn to loop under bridge 	<ul style="list-style-type: none"> Signal at SE Tacoma Street/SE 6th Avenue intersection 	<ul style="list-style-type: none"> Signal at SE Tacoma Street/SE 6th Avenue intersection
Potential Bridge Type ^b	<ul style="list-style-type: none"> Retain existing bridge (i.e., continuous truss span) Stress-ribbon or cable-stayed for bike/pedestrian bridge 	<ul style="list-style-type: none"> Retain existing bridge (i.e., continuous truss span) 	<ul style="list-style-type: none"> Through-arch 	<ul style="list-style-type: none"> Delta-frame or deck-arch 	<ul style="list-style-type: none"> Box-girder or through-arch
Property Access	<ul style="list-style-type: none"> New roadway to provide access to River View Cemetery, Staff Jennings, and Powers Marine Park Relocated access to Willamette Moorage Park and Macadam Bay Club 	<ul style="list-style-type: none"> New roadway to provide access to River View Cemetery, Staff Jennings, and Powers Marine Park Relocated access to Willamette Moorage Park and Macadam Bay Club 	<ul style="list-style-type: none"> No motor vehicle access from OR 43 to River View Cemetery or Powers Marine Park Relocated access to Willamette Moorage Park and Macadam Bay Club Powers Marine Park accessed by footpath from Willamette Moorage Park 	<ul style="list-style-type: none"> New roadway to provide access to River View Cemetery, Staff Jennings, and Powers Marine Park Relocated access to Willamette Moorage Park and Macadam Bay Club 	<ul style="list-style-type: none"> New roadway to provide access to River View Cemetery, Staff Jennings, and Powers Marine Park Relocated access to Willamette Moorage Park and Macadam Bay Club
Traffic Access during Construction	<ul style="list-style-type: none"> No traffic access during construction Traffic diverted to other existing bridges 	<ul style="list-style-type: none"> Temporary detour bridge option to maintain traffic access 	<ul style="list-style-type: none"> No traffic access during construction Traffic diverted to other existing bridges 	<ul style="list-style-type: none"> Bridge construction staged to maintain traffic access during construction 	<ul style="list-style-type: none"> Traffic access maintained on existing bridge during construction of the new bridge

Table S-2, cont. Build Alternative Characteristics.

Alternative	A	B	C	D	E
Construction Cost (in 2012 dollars) ^c	<ul style="list-style-type: none"> • \$331 million (stress-ribbon bike/pedestrian bridge) • \$337 million (cable-stayed bike/pedestrian bridge) • Right-of-way cost of \$10.8 million (included in total construction cost) 	<ul style="list-style-type: none"> • \$326 million • \$356 million (including temporary detour bridge) • Right-of-way cost of \$10.8 million; \$11.7 million including temporary detour bridge (included in total construction cost) 	<ul style="list-style-type: none"> • \$280 million • Right-of-way cost of \$14.3 million (included in total construction cost) 	<ul style="list-style-type: none"> • \$293 million (delta-frame bridge) • \$311 million (deck-arch bridge) • Right-of-way cost of \$17.7 million (included in total construction cost) 	<ul style="list-style-type: none"> • \$281 million (box-girder bridge) • \$361 million (through-arch bridge) • Right-of-way cost of \$24.6 million (included in total construction cost)
Construction Cost Breakdown (in 2012 dollars) ^c	<ul style="list-style-type: none"> • Rehabilitated vehicle bridge: \$185 million • Bike/pedestrian bridge: \$52 million (stress-ribbon); \$58 million (cable-stayed) • West-side interchange: \$93 million • East-side intersection: \$1.6 million 	<ul style="list-style-type: none"> • Rehabilitated vehicle bridge: \$222 million • Temporary detour bridge: \$30 million • West-side interchange: \$102 million • East-side intersection: \$1.6 million 	<ul style="list-style-type: none"> • Replacement bridge: \$185 million • West-side interchange: \$90 million • East-side intersection: \$5.4 million 	<ul style="list-style-type: none"> • Replacement bridge: \$202 million (delta-frame); \$220 million (deck-arch) • West-side interchange: \$89 million • East-side intersection: \$1.9 million 	<ul style="list-style-type: none"> • Replacement bridge: \$189 million (box-girder); \$269 million (through-arch) • West-side interchange: \$88 million • East-side intersection: \$3.9 million

^a 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.

^b Bridge design types are specified in the DEIS for analysis purposes only to identify impacts and estimate costs and construction activities.

^c 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.

have been evaluated within the context of individual Build alternatives. However, some features could be substituted into other alternatives when identifying a preferred alternative. These features include optional treatments at the SE 6th Avenue and SE Tacoma Street intersection and use of a temporary detour bridge during construction.

Summary of Major Environmental Impacts

Table S-3 summarizes major environmental impacts among the No Build and Build alternatives by social or natural environment discipline and element.

Table S-3. Summary of Anticipated Impacts of the No Build Alternative and the Build Alternatives.

Discipline	Element	No Build	A	B and B with Temporary Detour Bridge (if different from B)	C	D	E
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>	Traffic would be detoured for 42 months during construction.	Staged construction would allow traffic to continue to cross the river during construction.	Traffic would be maintained on the existing bridge during construction of the new bridge.
	West-side interchange impacts	Same interchange as existing conditions.	Operates 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 are blocked.	Operates 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 are blocked.	Operates at LOS B or better. Trumpet interchange provides better mobility and queuing than the roundabout interchange type. This interchange type is a free flow design, but operates within the constraints on SE Tacoma Street and OR 43.	Operates at LOS D or better. Signalized intersection on upper level provides better mobility and queuing than the roundabout interchange type under peak hour conditions. Provides free flow on OR 43, but operates within the constraints on OR 43.	Operates at LOS D or better. Signalized intersection on upper level provides better mobility and queuing than the roundabout interchange type under peak hour conditions. Provides free flow on OR 43, but operates within the constraints on OR 43.
	East-side connection—SE Tacoma Street/SE 6th Avenue intersection	Same as existing conditions.	Same as existing conditions.	Same as existing conditions.	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.

Table S-3, cont. Summary of Anticipated Impacts of the No Build Alternative and the Build Alternatives.

Discipline	Element	No Build	A	B and B with Temporary Detour Bridge (if different from B)	C	D	E
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.	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.	Potential conflicts with motorists making turning movements in west-side interchange area.	Potential conflicts with motorists making turning movements in west-side interchange area.
	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.	None.	None.	Lack of south spiral ramp on west-side creates circuitous routing for some users.
	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."	Accommodates bi-directional traffic on a 20-foot-wide shared-use path on lower bridge deck.	Two 12-foot-wide sidewalks/ shared use paths would accommodate bi-directional pedestrians and bicyclists. 6.5-foot-wide on-street bicycle lanes in each direction.	8-foot-wide south shared-use path would accommodate one-way eastbound bicycle traffic and two-way pedestrian traffic. 16-foot-wide north shared used path would accommodate bi-directional traffic.
3.3 Right-of-Way and Relocation	Total land area acquired for right-of-way	0 acres	10.5 acres	10.5 acres <i>10.8 acres</i>	10.8 acres	10.7 acres	11.6 acres
	Number of displaced residential condominiums units	0 units	1 unit	1 unit	1 unit	5 units	6 units
	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) <i>10 businesses (The viability of these businesses is not dependent on their specific locations)</i>	10 businesses (The viability of one business, Staff Jennings, is dependent on its specific location)	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)
	Right-of-way cost (included in total construction cost)	\$0	\$10.8 million	\$10.8 million <i>\$11.7 million</i>	\$14.3 million	\$17.7 million	\$24.6 million
3.4 Utilities	Utility relocation cost	\$0.14 million	\$2.87 million	\$3.20 million <i>\$4.60 million</i>	\$3.19 million	\$3.28 million	\$3.61 million

Table S-3, cont. Summary of Anticipated Impacts of the No Build Alternative and the Build Alternatives.

Discipline	Element	B and B with Temporary Detour Bridge (if different from B)					
		No Build	A	B	C	D	E
3.5 Land Use	Consistent with all applicable regulations, plans, and guidance documents?	Yes	Yes	Yes	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>Comprehensive Plan</i>)
3.6 Economics	Employees displaced	0 employees	30 employees	30 employees <i>62 employees</i>	46 employees	30 employees	216 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	\$280 million	\$293 million (delta-frame bridge) \$311 million (deck-arch bridge)	\$281 million (box-girder bridge) \$361 million (through-arch bridge)
	Construction duration	12 months	36 months	36 months <i>39 months</i>	42 months	51 months (deck-arch) 45 months (delta-frame)	36 months (box-girder) 42 months (through-arch)
	Bridge closure during construction	6 to 8 months (for maintenance activities)	24 months	24 months <i>No closure</i>	42 months	No closure	No closure
	Travel time and vehicle operating cost of bridge closure	\$19.1 million	\$63.3 million	\$63.3 million <i>No closure</i>	\$110.8 million	No closure	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 <i>No closure</i>	\$6.7 to \$17.0 million	No closure	No closure
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)	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)
	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>	No (42-month closure)	Yes	Yes
	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 limitation for west-side customers (during 42-month closure)	None	None
	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	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

Table S-3, cont. Summary of Anticipated Impacts of the No Build Alternative and the Build Alternatives.

Discipline	Element	No Build	A	B and B with Temporary Detour Bridge (if different from B)	C	D	E
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	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
3.9 Parks and Recreation	Total parkland acres converted	0 acres	4.3 acres	3.9 acres	4.3 acres	3.9 acres	3.8 acres
	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)	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)	5 facilities (Powers Marine Park, Willamette Moorage Park, Springwater Corridor Trail, Willamette Greenway Trail [East Bank], Willamette Greenway Trail [West Bank])	6 facilities (Oaks Pioneer Park, Powers Marine Park, Willamette Moorage Park, Springwater Corridor Trail, Willamette Greenway Trail [East Bank], Willamette Greenway Trail [West Bank])
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	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
	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	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
	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	Yes, Bridge replaced	Yes, Bridge replaced	Yes, Bridge replaced
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	400 lineal feet	660 lineal feet	800 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	450 lineal feet	650 lineal feet	950 lineal feet
	Significant east-side visual change?	No	No	No	No	No	Yes (bridge on new alignment)
	Significant west-side visual change?	No	Yes	Yes	Yes	Yes	Yes
3.12 Geology	Maximum fill height	0 feet	36 feet	21 feet	38 feet	28 feet	30 feet
	Maximum cut height	0 feet	49 feet	38 feet	65 feet	41 feet	57 feet
	Fill height in Sellwood landslide	0 feet	0 feet	0 feet	12 feet	28 feet	10 feet
	Cut height in Sellwood landslide	0 feet	18 feet	18 feet	0 feet	18 feet	8 feet

Table S-3, cont. Summary of Anticipated Impacts of the No Build Alternative and the Build Alternatives.

Discipline	Element	No Build	A	B and B with Temporary Detour Bridge (if different from B)	C	D	E
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)	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)
	Improves water quality compared to existing conditions?	No	Yes	Yes	Yes	Yes	Yes
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>	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.
	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>	2.33% 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)
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	3.5	1.5 (deck-arch bridge) 2.6 (delta-frame bridge)	2.5 (through-arch bridge) 4.7 (box-girder bridge)
3.16 Vegetation	Area of Lowland Conifer-Hardwood Forest removed	0 acres	9.6 acres	9.4 acres	8.8 acres	9.4 acres	9.8 acres
	Area of Westside Riparian habitat removed	0 acres	0.5 acre	0.6 acre <i>0.7 acre</i>	0.5 acre	0.6 acre	0.5 acre
	Area of noxious weeds removed	0 acres	0.1 acre	0.1 acre	0.3 acre	0.2 acre	0.1 acre
3.17 Wetlands	Disturbed acres of wetland	0 acres	0.1 acre	0.1 acre	0.1 acre	0.1 acre	0.1 acre
3.18 Wildlife Habitat	Disturbed acres of wildlife habitat	0 acres	20.8 acres	20.6 acres	18.9 acres	20.6 acres	20.7 acres
3.19 Noise	Number of residences impacted (noise level of 65 decibels or higher)	24 residences	18 residences	20 residences <i>16 residences</i>	18 residences	18 residences	16 residences

Table S-3, cont. Summary of Anticipated Impacts of the No Build Alternative and the Build Alternatives.

Discipline	Element	No Build	A	B and B with Temporary Detour Bridge (if different from B)	C	D	E
	Impacts to interior of Oaks Pioneer Church? (That is, noise level 50 decibels or higher when doors and windows are open) Existing level=49 decibels	Yes, 50 decibels	Yes, 50 decibels	No, 49 decibels Yes, 54 decibels, during construction	Yes, 50 decibels	Yes, 50 decibels	Yes, 51 decibels
	Number of businesses impacted (noise level of 70 decibels or higher)	1 business	1 business	1 business	1 business	1 business	1 business
	Noise level increase from existing conditions	Up to 2 decibels	Up to 1 decibel	Up to 1 decibel Up to 5 decibels	Up to 1 decibel	Up to 3 decibels	Up to 2 decibels
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	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)
	Energy used during operation (annual)	1,666 million Btu	2,177 million Btu	2,177 million Btu	2,177 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)	3.9 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	10 sites	6 sites	7 sites



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

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 DEIS addresses many of the issues raised. The other comments are outside the scope of the project and, therefore, are not discussed in this DEIS. 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.

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	Livability was linked by the community to maintaining two travel lanes on the bridge, making bridge improvements compatible with the <i>Tacoma Main Street Plan</i> , and reducing commuter and neighborhood cut-through traffic impacts. Alternatives A, B, and D 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 three different options for the intersection of SE Tacoma Street and SE 6th Avenue—existing conditions, a right-turn loop under the bridge, and a signal—that have different effects on neighborhood cut-through traffic analyzed in this DEIS.
Consistency with the policies, goals, and objectives in the <i>Tacoma Main Street Plan</i>	Alternatives A, B, D, and E include two travel lanes on the Sellwood Bridge. Alternative E also includes two additional lanes limited to transit use. Alternative C includes three travel lanes (one lane westbound and two eastbound). The No Build Alternative and all Build alternatives 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.
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 minimizes impacts to the residential units immediately north and south of the existing bridge, is analyzed in this DEIS.
Bicycle and pedestrian access and connections to area trails	The Build alternatives would 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	Alternatives with two travel lanes (Alternatives A, B, and D) and three travel lanes (Alternative C) are analyzed in the DEIS 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.

Table S-4, cont. *Areas of Controversy and Resolution.*

Issue/Theme	Resolution
Accommodate large vehicles, including transit, trucks, and emergency vehicles	The Build alternatives would meet applicable geometric roadway design standards to safely accommodate 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.
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 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 would not meet these design standards.
West-side landslide	The No Build Alternative would rebuild the west bridge approach with drilled shafts, which could help to stabilize the existing landslide in the area. The Build alternatives would include mitigation to improve stability of the existing landslide.
Bridge closure during construction	Traffic across the river during construction would be maintained under Alternatives D and E. Alternative B would include 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 would not be able to move ahead with construction until after a Financial Plan had been developed demonstrating how the project would be funded and FHWA had approved that Financial Plan.
Recreational facility impacts	Recreational facility impacts were included in the evaluation framework to screen the range of alternatives. Recreational facility impacts were extensively analyzed in the Draft Section 4(f) Evaluation.
Historic resource impacts	Historic 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 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 DEIS.
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.

Table S-4, cont. *Areas of Controversy and Resolution.*

Issue/Theme	Resolution
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 by Multnomah County) and its interconnection with OR 43 (owned by ODOT). Because SE Tacoma Street (owned 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.

Major Unresolved Issues with Other Agencies

The identification of a preferred alternative will be the first step in resolving most outstanding issues. A preferred alternative will be identified after comments on this DEIS have been fully considered and evaluated. The major unresolved issues are:

- Funding sources for the No Build Alternative or any of the five Build alternatives. 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.
- Interchange Area Management Plan and Access Management Plan for the Sellwood Bridge/OR 43 interchange. Accesses near the interchange would be in violation of state access management spacing standards. The Build alternatives would need a deviation from access management spacing standards from ODOT.
- Inter-governmental agreements between Multnomah County and Metro for the Willamette Shoreline Trolley, the streetcar undergoing planning, and the Willamette Greenway Trail. The cost included in this project is for the replacement of right-of-way and additional right-of-way required for the wider streetcar and trail facility; the fill and track replacement associated with one track (two tracks and a path are proposed); 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.

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 what is now Powers Marine Park and toward Staff Jennings (a commercial boat business north of the existing bridge). 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 replacement right-of-way and design presented in this DEIS would be sufficient for two tracks for a streetcar and a paved Willamette Greenway Trail (West Bank). 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 cost included in this project is for the replacement of existing right-of-way and additional right-of-way required for a

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

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
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
U.S. Fish and Wildlife Service/ National Marine Fisheries Service	Section 7 Endangered Species Act Consultation
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 Transportation	Interchange Area Management and Access Management Plan (Oregon Administrative Rule [OAR] 734-051-0155)
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
City of Portland	Type II Environmental Permit

Table S-5, cont. *Other Federal, State, and Local Actions Required.*

Agency	Regulation or Approval
City of Portland	Conditional Use Permit
City of Portland	Non Park Use Permit
City of Portland	Noise Ordinance Variance

realigned double track; the track replacement; any fill or structure required; and the construction of any necessary retaining walls.

Other major actions proposed by other governmental agencies include the following:

- 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 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 a bicycle and pedestrian improvement project 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 Sellwood Bridge and SE 45th Street
- Construction of a multi-use path segment to complete Springwater Corridor Trail between SE Umatilla Street and SE Ochoco Street
- Improvements to the SE Spokane Street and SE Umatilla Street bike boulevards

Existing Sellwood Bridge.

