

Lake Oswego to Portland Transit Project

Historic, Archaeological, and Cultural Resources Technical Report

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TriMet and Metro

Oregon SHPO Project #09-2299

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1. INTRODUCTION

This report contains the detailed analysis and documentation that is the basis for Chapter 3, Section 3.5 Historic, Archaeological and Cultural Resources in the Lake Oswego to Portland Transit Project (LOPT) Draft Environmental Impact Statement (DEIS) published by the Federal Transit Administration in December 2010. This chapter of the report includes a summary of the project background, the Purpose and Need, the alternatives/options considered and the description of the alternatives analyzed.

1.1 Project Background

Transit improvements in the Lake Oswego to Portland corridor have been studied several times in recent history. In the 1970s and 80s, a light rail alignment through Johns Landing was studied as part of the Westside Corridor Alternatives Analysis, and in the 1990s potential light rail alignments through Johns Landing were studied as part of the South/North Corridor Study.

The Willamette Shore Line right of way was first established in 1885-1887 as the Portland and Willamette Valley Railroad, which began operation in July 1887. The Southern Pacific Railroad (SPRR) later purchased the railway in 1914. The railroad had a major impact on the development of southwest Portland. Initially, 14 trains operated between Portland and Oswego (as it then was known), and it became the main transportation link for developing residential communities along the route. The line was electrified in 1914 and passenger traffic hit its peak in 1920 with SPRR running 64 daily trains between Portland and Oswego. Passenger service ended on October 5, 1929, while freight service continued until 1983.

In August of 1984, the Interstate Commerce Commission granted SPRR permission to abandon the line. In 1988, the Willamette Shore Line Consortium (the Consortium) purchased the 6.3-mile-long line from SPRR for approximately \$2 million. The Consortium, comprised of the City of Lake Oswego, City of Portland, Oregon Department of Transportation (ODOT), Clackamas County, Multnomah County, Metro, and TriMet, purchased the line to preserve it for future passenger rail transit use. TriMet holds title for the Consortium and the City of Lake Oswego provides maintenance services funded by the Consortium.

In 2005, with the endorsement of the Joint Policy Advisory Committee on Transportation, the Metro Council directed staff to initiate the Lake Oswego to Portland Transit and Trail Alternatives Analysis. The alternatives analysis focused on improving the ability to serve travel demand in the corridor through improved transit service and development of a multi-use pathway.

1.2 Purpose and Need

The **Purpose** of the project is to optimize the regional transit system by improving transit within the Lake Oswego to Portland transit corridor, while being fiscally responsive and supporting regional and local land use goals. The project should maximize, to the extent possible, regional resources and economic development opportunities, and garner broad public support. The project should build on previous corridor transit studies, analyses, and conclusions and should be environmentally sensitive.

The **Need** for the project results from:

- Historic and projected increases in traffic congestion in the Lake Oswego to Portland corridor due to increases in regional and corridor population and employment;
- Lengthy and increasing transit travel times and deteriorating public transportation reliability in the corridor due to growing traffic congestion;
- Increasing operating expenses, combined with increasingly scarce operating resources and the demand for more efficient public transportation operations;
- Local and regional land use and development plans, goals, and objectives that target the corridor for residential, commercial, retail, and mixed-use development to help accommodate forecast regional population and employment growth, and previous corridor transit studies, analyses, and conclusions;
- The region's growing reliance on public transportation to meet future growth in travel demand in the corridor;
- The topographic, geographic, and built-environment constraints within the corridor that limit the ability of the region to expand the highway and arterial infrastructure in the corridor; and
- Limited options for transportation improvements in the corridor caused by the identification and protection of important natural, built, and socioeconomic environmental resources in the corridor.

1.3 Alternatives/Options Considered

Metro's 2004 Regional Transportation Plan (RTP) identified the need for a refinement plan for a high capacity transit option for the corridor, which included an analysis of several modal alternatives. Metro initiated the corridor refinement plan in July 2005 and issued the *Lake Oswego to Portland Transit and Trail Alternatives Analysis Evaluation Summary Public Review Draft* in June 2007.

On December 13, 2007, after reviewing and considering the alternatives analysis report, public comment, and recommendations from the Lake Oswego to Portland Transit and Trail Project Citizen Advisory Committee (CAC), the Lake Oswego to Portland Transit and Trail Project Management Group (PMG), Steering Committee, and partner jurisdictions and agencies, the Metro Council approved Resolution No. 07-3887A. The resolution adopted the *Lake Oswego to Portland Transit and Trail Alternatives Analysis: Alternatives to be Advanced into a Draft Environmental Impact Statement and Work Program Considerations* (December 13, 2007). (See Section 2.1 for additional detail on the process used to identify and narrow alternatives.) It also selected the No-Build, Enhanced Bus, and Streetcar alternatives to advance into the project's DEIS for further study, and directed staff to conduct a refinement study to identify design options in the Johns Landing Area and terminus options to advance into the project's DEIS. The resolution called for further refinement of the trail component to move forward as a separate process.

1.3.1 Alternatives Analysis

The project's alternatives analysis process developed a wide range of alternatives for evaluation and early screening, which included: a no-build alternative, widening of Highway 43, reversible lanes on Highway 43, river transit (three options), bus rapid transit (BRT) (three options); commuter rail, light rail, and streetcar (a wide range of alignment alternatives and terminus alternatives and options).

Through a screening process that assessed the ability of the alternatives to meet the project's Purpose and Need, the initial range of possible alternatives was narrowed. Appendix C of the DEIS provides a summary of the technical evaluation of the alternatives and options considered during the alternatives analysis phase.

The following alternatives were selected for further study through the alternatives analysis phase: 1) No-Build Alternative, 2) Bus Rapid Transit Alternative, and 3) Streetcar Alternative. Following is a description of those alternatives as they were studied in the alternatives analysis (see the *Lake Oswego to Portland Transit and Trail Study Evaluation Summary Public Review Draft* for more information).

- **No-Build Alternative.** Similar to the project's current No-Build Alternative, as described in Section 1.4.1.
- **Bus Rapid Transit Alternative.** The Bus Rapid Transit Alternative would operate frequent bus service with Line 35 on Highway 43 between downtown Portland and downtown Lake Oswego, generally in mixed traffic, with bus station spacing that would be longer than TriMet typically provides for fixed-route bus service. Transit queue bypass lanes would be constructed at congested intersections, where feasible.
- **Streetcar Alternative.** The Streetcar Alternative would extend the existing Portland Streetcar line, which currently operates between NW 23rd Avenue and SW Lowell Street, to downtown Lake Oswego. Study of this alternative includes an evaluation of whether the Willamette Shore Line right of way would be used exclusively or whether it would be used in combination with SW Macadam Avenue or other adjacent roadways.

1.3.2 Scoping/Project Refinement Study

This section describes the alignment and terminus options developed, evaluated, and screened in 2009 as a part of the project's scoping and refinement study phase. In November 2010, Metro published the *Lake Oswego to Portland Transit Project Refinement Report*, which detailed the study's results and summarized public comment. This phase focused on refinements in two areas: 1) alignment options for the Johns Landing area; and 2) terminus options in the Lake Oswego area. In summary, the project's Purpose Statement during the refinement phase was to:

- Optimize the regional transit system;
- Be fiscally responsive and maximize regional resources;
- Maximize the economic development potential of the project;
- Be sensitive to the built and social environments; and
- Be sensitive to the natural environment.

The options, evaluation measures, and results of the Johns Landing streetcar alignment refinement process and the Lake Oswego terminus refinement processes are summarized below.

A. Johns Landing Streetcar Alignment Refinement. For the refinement of streetcar design options within the Johns Landing area, the project used the following criteria: streetcar operations, streetcar performance, financial feasibility, traffic operations, accessibility and development potential,

neighborhood sustainability, and adverse impacts to the natural environment. Measures for each of the criteria were developed and applied to each of the alignment options studied, which included:

- Hybrid 1: Macadam Avenue In-Street
- Hybrid 2: East Side Exclusive
- Hybrid 3: Macadam Avenue with New Northbound Lane
- Willamette Shore Line
- Full Macadam In-Street

B. Lake Oswego Terminus Option Refinement. For the refinement of terminus options in the Lake Oswego area, the project used the following criteria: expansion potential and regional context, streetcar operations, streetcar performance, financial feasibility, traffic operations, accessibility and development potential, and neighborhood sustainability. Measures for each of the criteria were developed and applied to each of the alignment options studied, which included: a) Safeway Terminus Option; b) Albertsons Terminus Option; and c) Trolley Terminus Option.

On June 1, 2009, in consultation with FTA and based on the findings of the analysis, public and agency comment and recommendations from the Lake Oswego to Portland Project Management Group, the Lake Oswego to Portland Transit Project Steering Committee selected the following options in the Johns Landing area to advance into the DEIS: Willamette Shore Line; Hybrid 1 – Macadam Avenue In Street (Boundary Street to Carolina Street); and Hybrid 3: Macadam Avenue with New Northbound Lane (Boundary Street to Carolina Street).

1.4 Description of Alternatives Analyzed in this Technical Report and the DEIS

This section summarizes the roadway and transit capital improvements and transit operating characteristics for the No-Build, Enhanced Bus, and Streetcar alternatives. Table 1-1 provides a summary of the transit capital improvements associated with the three alternatives, and Table 1-2 summarizes the operating characteristics of the alternatives. A more detailed description of the alternatives may be found in the *Lake Oswego to Portland Transit Project Detailed Definition of Alternatives Report* (Metro/TriMet: January 2010). Detailed drawings of the Streetcar Alternative, including the various design options, can be found in the *Streetcar Plan Set*, November 2009.

1.4.1 No-Build Alternative

This section describes the No-Build Alternative, which serves as a reference point to gauge the benefits, costs, and effects of the Enhanced Bus and Streetcar alternatives. In describing the No-Build Alternative, this section focuses on: 1) the alternative's roadway, bicycle and pedestrian, and transit capital improvements; and 2) the alternative's transit operating characteristics. This description of the No-Build Alternative is based on conditions in 2035, the project's environmental forecast year.

1.4.1.1 Capital Improvements

Following is a brief description of the roadway, bicycle and pedestrian, and transit capital improvements that would occur under the No-Build Alternative. Table 1-1 provides a summary of the transit capital improvements associated with the No-Build Alternative and Table 1-2 summarizes the operating characteristics of the alternatives. Figure 1-1 illustrates the location of those improvements.

- **Roadway Capital Improvements.** The No-Build Alternative includes the existing roadway network in the corridor, with the addition of roadway capital improvements that are listed in the financially constrained road network of Metro's 2035 RTP.¹ Following is a list of the roadway projects that would occur within the corridor by 2035.
 - *Moody/Bond Avenue Couplet* (create couplet with two lanes northbound on SW Bond Avenue and two lanes southbound on SW Moody Avenue);
 - *South Portal* (Phases I and II to extend the SW Moody Avenue/SW Bond Avenue couplet to SW Hamilton Street and realign SW Hood Avenue to connect with SW Macadam Avenue at SW Hamilton Street);
 - *I-5 North Macadam* (construct improvements in the South Waterfront District to improve safety and access); and
 - *Macadam Intelligent Transportation Systems* (install system and devices in the SW Macadam Avenue corridor to improve traffic flow).

¹ Metro, 2035 Regional Transportation Plan, approved Dec. 13, 2007.

**Table 1-1 Transit Capital Improvements for the
No-Build, Enhanced Bus, and Streetcar Alternatives (2035)**

Capital Improvements	No-Build	Enhanced Bus	Streetcar¹
<i>New Streetcar Alignment Length²</i>	N/A	N/A	5.9 to 6.0
<i>One-Way Streetcar Track Miles</i>			
Portland Streetcar System	15.7	15.7	26.2 to 27.0
Proposed Lake Oswego to Portland Project	0	0	10.5 to 11.3
<i>Streetcar Stations</i>			
Portland Streetcar System	69	69	79
Proposed Lake Oswego to Portland Project	0	0	10 ³
<i>Streetcars (in service/spares/total)</i>			
Portland Streetcar System	17/5/22	17/5/22	27/6/33
Proposed Lake Oswego to Portland Project	N/A	N/A	10/1/11
<i>Streetcar Operations and Maintenance (O&M) Facilities</i>			
Number of Facilities ⁴	1	1	2
Maintenance Capacity (number of Streetcars)	36	36	36
Storage Capacity (number of Streetcars)	25	25	33
Line 35 Bus Stops			
<i>Line 35 Bus Stops (Lake Oswego to SW Bancroft St.)</i>	26	13	0
<i>Buses (in service/spares)</i>			
TriMet Systemwide	607/712	619/725	601/704
Difference from No-Build Alternative	N/A	13	- 8
Transit Centers⁵	1	1	1
Park-and-Ride Facilities			
Joint Use Surface – Lots/Spaces	3/76	3/76	3/76
Surface – Lots/Spaces	0/0	0/0	1/100
Structured – Lots/Spaces	0/0	1/300	1/300

Note: LO = Lake Oswego; O&M = operating and maintenance.

¹ The transit capital improvements of the Streetcar Alternative summarized in this table would not vary by design option, except when shown as a range and as noted for new streetcar alignment length and one-way track miles. The first number listed is under the Willamette Shore Line design option and the second number listed is under the Macadam design options (in the Johns Landing Segment).

² Under the No-Build and Enhanced Bus alternatives, the Portland Streetcar System would include two streetcar lines: a) the existing Portland Streetcar Line, between NW 23rd Avenue and SW Bancroft Street, and b) the Portland Streetcar Loop, which is currently under construction and will be completed when the Milwaukie Light Rail and Streetcar Close the Loop project are constructed. The Streetcar Alternative would extend the existing Portland Streetcar line south, from SW Bancroft Street to Lake Oswego. One-way track miles are calculated by multiplying the mileage of double-tracked sections and adding that to the mileage of single-track sections. Alignment length and one-way track miles are presented as a range, because they would vary by design option. The number of streetcar stations, streetcars in service or as spares and the number and size of streetcar O&M facilities would not change by streetcar design option.

³ Two optional stations are also being considered for inclusion in the Streetcar Alternative (see Figure 1-5 and Figure 1-6): 1) the Pendleton Station under the Macadam In-Street and Macadam Additional Lane design options in the Johns Landing Segment; and the E Avenue Station in the Lake Oswego Segment.

⁴ There is an existing streetcar operations and maintenance (O&M) facility at NW 16th Avenue, between NW Marshall and NW Northrup streets; under the Streetcar Alternative, additional storage for eight vehicles would be provided along the streetcar alignment under the Marquam Bridge. There would be no change in the number or size of bus O&M facilities under any of the alternatives or design options. Bus stops are those that would be served exclusively by Line 35 between Lake Oswego and SW Bancroft Street

⁵ Under the No-Build and Enhanced Bus alternative, the Lake Oswego Transit Center would remain at its current location (on 4th Street, between A and B avenues); under the Streetcar Alternative, the transit center would be moved to be adjacent to the Lake Oswego Terminus Station.

Source: TriMet, January 2010.

**Table 1-2 Streetcar and Bus Network Operating Characteristics of
No-Build, Enhanced Bus, and Streetcar¹ Alternatives (2035)**

Operating Characteristics by Vehicle Mode	No-Build	Enhanced Bus	Streetcar
Streetcar Network Operating Characteristics¹			
<i>Weekday Streetcar Vehicle Miles Traveled</i>			
Systemwide	2,180	2,180	3,200 or 3,230
Difference from No-Build Alternative	N/A	0	1,020 or 1,050
<i>Weekday Streetcar Revenue Hours</i>			
Systemwide	267	267	326 or 332
Difference from No-Build Alternative	N/A	0	59 or 65
<i>Corridor Weekday Streetcar Place Miles²</i>	N/A	N/A	89,000 or 91,320
<i>Corridor Streetcar Round-Trip Time³</i>	N/A	N/A	37 or 44 minutes
<i>Corridor Streetcar Headways⁴</i>			
Lake Oswego to PSU	N/A	N/A	7.5 / 7.5 minutes
Bus Network Operating Characteristics			
<i>Weekday Bus Miles Traveled</i>			
Systemwide	76,560	77,560	75,520
Difference from No-Build Alternative	N/A	1,000	-1,040
<i>Weekday Bus Revenue Hours</i>			
Systemwide	5,300	5,400	5,210
Difference from No-Build Alternative	N/A	100	-90
<i>Line 35 (bus) Weekday Place Miles²</i>	37,000	57,840	0
<i>Line 35 (bus) Headways⁴</i>			
Lake Oswego to Downtown Portland	15 / 15 min.	6 / 15 min.	N/A
Oregon City to Lake Oswego	15/15 min.	15/15 min.	15/15 min.

Note: N/A = not applicable; LO = Lake Oswego; O&M = operating and maintenance; PSU = Portland State University.

¹ The operating characteristics of the Streetcar Alternative summarized in this table would not vary by design option, except when shown as a range and as noted for streetcar vehicle miles traveled, place miles, and round-trip time. The first number listed is under the Willamette Shore Line Design Option and the second number listed is under the Macadam design options (in the Johns Landing Segment).

² Place miles are a measure of the passenger carrying capacities of the alternatives, similar to airline seat miles. Place miles = transit vehicle capacity (seated and standing) of a vehicle type, multiplied by the number vehicle miles traveled for that vehicle type, summed across all vehicle types. The No-Build Alternative bus place miles are based on lines 35 and 36.

³ Round-trip run time for the proposed streetcar line would include in-vehicle running time from SW Bancroft Street to the Lake Oswego Terminus Station and back to SW Bancroft Street; it does not include layover time at the terminus.

⁴ Headways are the average time between transit vehicles per hour within the given time period that would pass by a given point in the same direction, which is inversely related to frequency (the average number of vehicles per hour in the given time period that would pass by a given point in the same direction). Weekday peak is generally defined as 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m.; weekday off-peak is generally defined as 9:00 a.m. to 4:00 p.m. and 6:00 p.m. to 1:00 a.m. There would be streetcar service every 12 minutes between SW Bancroft Street and the Pearl District (via PSU) under the No-Build and Enhanced Bus alternatives. The peak headways shown for the No-Build Alternative are the composite headways for Lines 35 and 36.

Source: TriMet – January 2010.

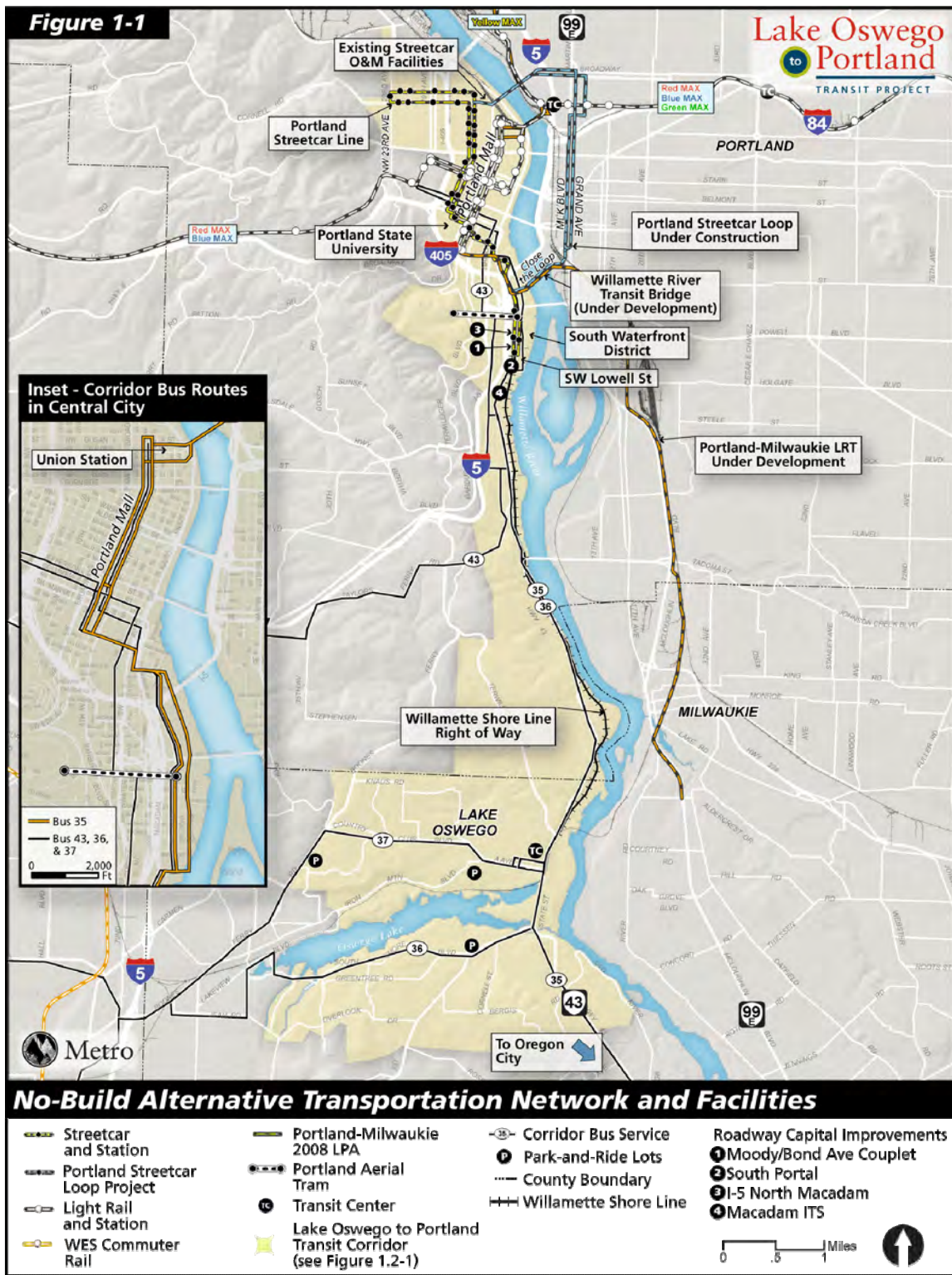


FIGURE 1-1 NO-BUILD ALTERNATIVE TRANSPORTATION NETWORK AND FACILITIES

- **Bicycle and Pedestrian Improvements.** The No-Build Alternative includes the existing bicycle and pedestrian network in the corridor, with the addition of bicycle and pedestrian capital improvements that are listed in the financially constrained road network of Metro's 2035 RTP. Following is a list of the bicycle and pedestrian projects that pedestrian projects proposed to occur within the corridor by 2035.
 - *Lake Oswego to Portland Trail* (extension of a multiuse path between Lake Oswego and Portland);
 - *I-5 at Gibbs Pedestrian/Bicycle Overcrossing* (construct a bicycle and pedestrian bridge over I-5 in the vicinity of SW Gibbs Street); and
 - *Tryon Creek Bridge* (construct a new pedestrian/bicycle bridge near the mouth of Tryon Creek).
- **Bus Capital Improvements.** There are currently two primary bus capital facilities in the corridor: *Lake Oswego Transit Center* (on 4th Street, between A and B avenues); and *Portland Mall* (bus and light rail lanes and shelters on NW/SW 5th and 6th avenues between NW Glisan Street and SW Jackson Street). These bus facilities would remain as-is under the No-Build Alternative. (The financially constrained transit project list of the RTP includes relocation of the Lake Oswego Transit Center to be adjacent to the Lake Oswego to Portland Streetcar alignment, which is also in the financially constrained project list. Neither would occur under the No-Build Alternative.) No additional bus capital improvements are planned for the corridor under the No-Build Alternative by 2035.
- **Light Rail Capital Improvements.** Under the No-Build Alternative, TriMet's existing Yellow Line light rail service would continue to operate on the Portland Mall (with a station at PSU added), across the Steel Bridge and into North Portland. Yellow Line facilities and service would be extended north from the existing Expo Center Station, across the Columbia River into Vancouver, Washington, and south from the Portland Mall, generally via SW Lincoln Street, across the Willamette River to Milwaukie, Oregon. In addition, downtown Portland would be served by the following TriMet light rail lines: Blue Line (Gresham to Hillsboro); Red Line (Beaverton to Portland International Airport); and Green Line (downtown Portland to Clackamas Town Center).
- **Excursion Trolley Capital Facilities.** Under the No-Build Alternative there would be no changes to the existing excursion trolley capital facilities that are located or operate within the corridor. Those excursion trolley capital facilities include approximately six miles of single-tracked Willamette Shore Line tracks and related facilities; stations at SW Bancroft and Moody streets and at N State Street at A Avenue; a trolley barn at approximately N State Street at A Avenue; and typically one vintage and/or other trolley vehicle propelled by externally attached diesel units.
- **Streetcar Improvements and Vehicles.** Under the No-Build Alternative, the existing Portland Streetcar Line would continue to operate between NW 23rd Avenue and SW Lowell Street. In addition, the No-Build Alternative includes the Eastside Streetcar Project (currently under construction), which would extend streetcar tracks and stations across the Broadway Bridge, serving NE and SE Portland on N and NE Broadway and NE and SE Martin Luther King Boulevard and Grand Avenue to OMSI. With the Close the Loop Project, the Eastside Streetcar will be extended across the Willamette River, to complete the planned Streetcar Loop, via a new

transit, bicycle, and pedestrian bridge to be constructed under the Milwaukie Light Rail Project, connecting to the Streetcar line in the South Waterfront District. Under the No-Build Alternative in 2035, there would be 22 streetcars in the transit system (including spares), an increase of 11 compared to existing conditions.

- **Park-and-Ride Facilities.** Under the No-Build Alternative, the park-and-ride facilities in the corridor would be those that currently exist: a shared-use 30-space park-and-ride lot at Christ Church (1060 SW Chandler Road); a shared-use 34-space park-and-ride lot at Lake Oswego United Methodist Church (1855 South Shore Boulevard); and a shared use 12-space park-and-ride lot at Hope Church (14790 SW Boones Ferry Road).
- **Operations and Maintenance Facilities.** Under the No-Build Alternative, there would be one operations and maintenance facility within the corridor, which would be the existing streetcar maintenance building and storage yard on NW 16th Avenue under I-405. With the Streetcar Loop and Close the Loop Projects, the storage yard could accommodate 25 streetcars and the maintenance facility would have the capacity to service 36 streetcars (an increase in capacity of 13 and 18 vehicles, compared to existing conditions, respectively).

1.4.1.2 Transit Operations

This section summarizes the transit operating characteristics that would occur under the No-Build Alternative, focusing on bus and streetcar operations (see Table 1-2). Figure 1-1 illustrates the transit network for the No-Build Alternative in the vicinity of the corridor.

- **Bus Operations.** Bus operations under the No-Build Alternative would be similar to TriMet's existing fixed-route bus network with the addition of improvements included in the 2035 RTP's 20-year financially constrained transportation system (see Figure 1-1). Transit service improvements within the No-Build Alternative would be limited to those that could be funded using existing and readily-foreseeable revenue sources. Systemwide, those bus operations improvements would include: 1) increases in TriMet bus route frequency to avoid peak overloads and/or maintain schedule reliability; 2) increases in run times to maintain schedule reliability; and 3) incremental increases in TriMet systemwide bus service hours consistent with available revenue sources and consistent with the 2035 RTP's 20-year financially-constrained transit network, resulting in annual increases in service hours of approximately 0.5 percent per year. Specifically, the No-Build Alternative would include the operation of the TriMet bus route Line 35 between downtown Portland and Lake Oswego (continuing south to Oregon City).
- **Streetcar Operating Characteristics.** Under the No-Build Alternative, the City of Portland, through an operating agreement with the Portland Streetcar, Inc. (PSI), would continue to operate the existing Portland Streetcar line between Northwest Portland and the South Waterfront District, via downtown Portland (see Figure 1-1). On average weekdays in 2035, the Streetcar line would operate every 12 minutes during the peak and off-peak periods. Further, the City of Portland would operate the Streetcar Loop Project, serving downtown Portland, the Pearl District, northeast and southeast Portland, OMSI and the South Waterfront District. Frequency on the line for an average weekday in 2035 would be every 12 minutes during the peak and off-peak periods.

1.4.2 Enhanced Bus Alternative

This section describes the roadway, bicycle and pedestrian, and transit capital improvements and transit operating characteristics under the Enhanced Bus Alternative, generally compared to the No-Build Alternative. The intent of the Enhanced Bus Alternative is to address the project's Purpose and Need without a major transit capital investment.

1.4.2.1 Capital Improvements

This section summarizes the transit, bicycle and pedestrian, and transit capital improvements that would occur under the Enhanced Bus Alternative, compared to the No-Build Alternative (see Table 1-1 and Figure 1-2).

- **Roadway Capital Improvements.** Except for the addition of a two-way roadway connection between the proposed 300-space park-and-ride lot and Foothills Road, there would be no change in roadway improvements under the Enhanced Bus Alternative, compared to the No-Build Alternative.
- **Bicycle and Pedestrian Improvements.** There would be no change in bicycle and pedestrian improvements under the Enhanced Bus Alternative, compared to the No-Build Alternative.
- **Bus Capital Improvements.** Under the Enhanced Bus Alternative, the 26 bus stops that would be served by Line 35 between downtown Lake Oswego and SW Bancroft under the No-Build Alternative would be consolidated into 13 bus stops, which would continue to be served by the Line 35 (the other 13 bus stops would be removed). The bus stops served by Line 35 between Lake Oswego and Oregon City would be unchanged under the Enhanced Bus Alternative, compared to the No-Build Alternative.
- **Light Rail Capital Improvements.** There would be no change in light rail capital improvements under the Enhanced Bus Alternative, compared to the No-Build Alternative.
- **Excursion Trolley Capital Improvements.** There would be no change in excursion trolley capital improvements under the Enhanced Bus Alternative, from the No-Build Alternative.
- **Streetcar Improvements and Vehicles.** There would be no change in streetcar improvements and vehicles under the Enhanced Bus Alternative, compared to the No-Build Alternative.
- **Park-and-Ride Facilities.** In addition to the park-and-ride facilities included under the No-Build Alternative, the Enhanced Bus Alternative would include a 300-space structured park-and-ride lot that would be located at Oswego Village Shopping Center on Highway 43 in downtown Lake Oswego. The park-and-ride lot would be served by Lines 35 and 36.
- **Operations and Maintenance Facilities.** There would be no changes to the region's operations and maintenance facilities under the Enhanced Bus Alternative, compared to the No-Build Alternative, except that the capacity of TriMet's bus operating and maintenance facilities at either the Center or Powell facility would be expanded to accommodate the additional 13 buses under the Enhanced Bus Alternative (see the *Detailed Definition of Alternatives Report* for additional information).

1.4.2.2 Transit Operations

This section summarizes the corridor's transit operations under the Enhanced Bus Alternative, focusing on bus and streetcar operations. Figure 1-2 illustrates the transit network for the Enhanced Bus Alternative in the vicinity of the corridor.

- **Bus Operations.** Except for changes to the routing, frequency, and number of stops of Line 35 and the elimination of Line 36 service between downtown Portland and downtown Lake Oswego, bus operations under the Enhanced Bus Alternative would be identical to the bus operations under the No-Build Alternative. Under the Enhanced Bus Alternative, Line 35's routing between Oregon City and Lake Oswego would remain unchanged relative to the No-Build Alternative. Further, between Lake Oswego and downtown Portland there would be two routing changes to Line 35, compared to the No-Build Alternative: 1) the bus would be rerouted to serve the new park-and-ride lot at the Oswego Village Shopping Center; and, 2) in downtown Portland, Line 35 would be rerouted to serve SW and NW 10th and 11th avenues, generally between SW Market and Clay streets and NW Lovejoy Street/Union Station to address the travel markets.
- **Streetcar Operating Characteristics.** Under the Enhanced Bus Alternative, there would be no change in streetcar operating characteristics, compared to the No-Build Alternative.

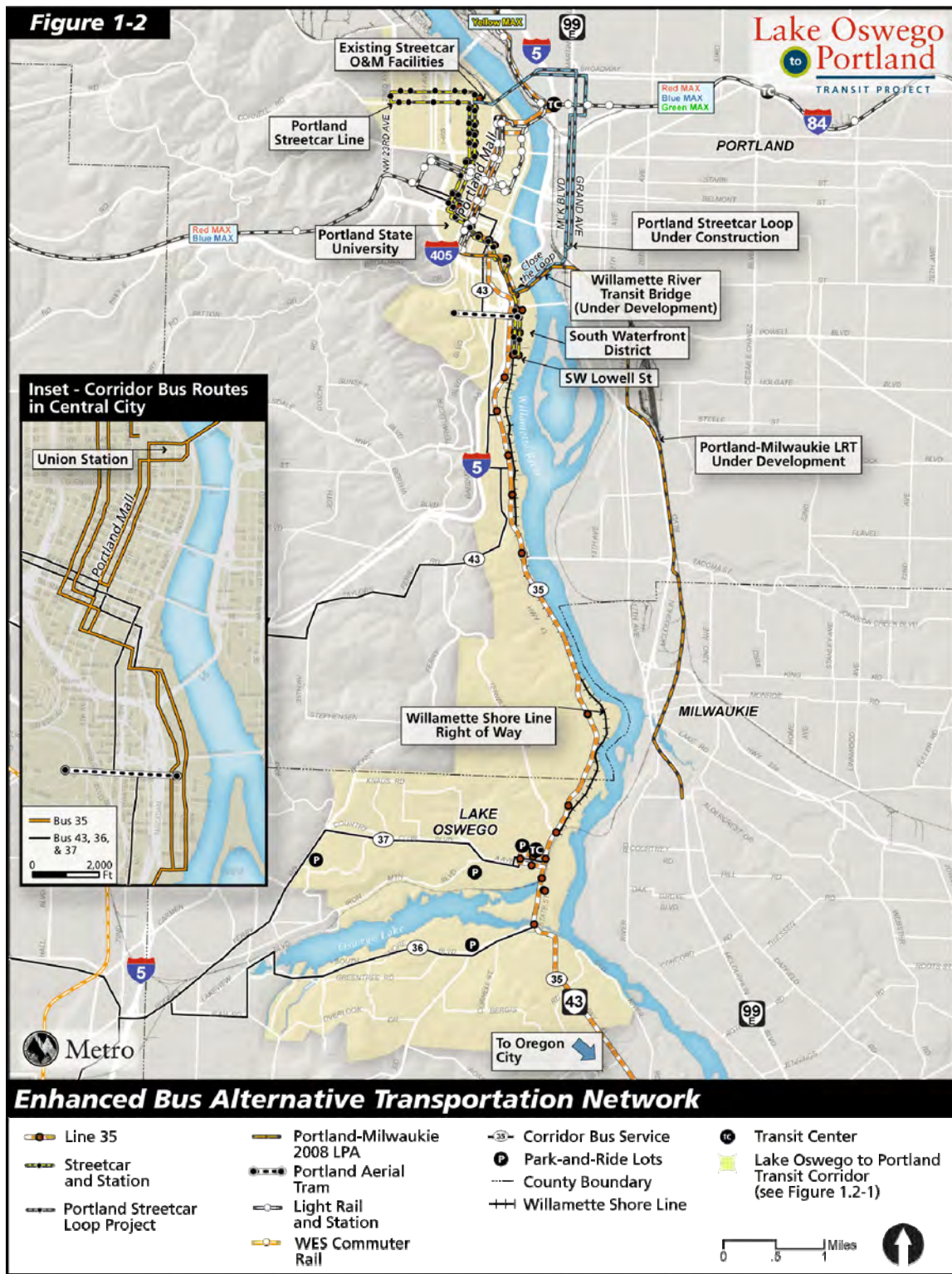


FIGURE 1-2 ENHANCED BUS ALTERNATIVE TRANSPORTATION NETWORK

1.4.3 Streetcar Alternative

This section describes the roadway, bicycle and pedestrian, and transit capital improvements and transit operating characteristics under the Streetcar Alternative, generally compared to the No-Build Alternative.

1.4.3.1 Capital Improvements

This section summarizes the transit, bicycle and pedestrian, and transit capital improvements that would occur under the Streetcar Alternative, generally compared to the No-Build Alternative (see Table 1-1 and Figure 1-3). This section provides a general description of the capital improvements that would occur under the Streetcar Alternative, independent of design option, and it highlights the differences between design options within three of the corridor's segments.

A. Summary Description

Following is a general description of the roadway, bicycle and pedestrian, and transit improvements that would occur under the Streetcar Alternative. The next section provides a description of differences in capital improvements for design options that are under consideration in three of the project's six segments. See Figure 1-4 for an illustration of the project segments and the design options under consideration.

- **Roadway Capital Improvements.** There would be no roadway improvements under the Streetcar Alternative in the following corridor segments: 1) Downtown Portland; and 2) South Waterfront. The roadway capital improvements that would occur under the other corridor segments are described below for those segments. Changes to traffic controls at signalized and non-signalized intersections would occur throughout the corridor to accommodate the safe and efficient operation of the streetcar and local traffic. The *Detailed Definition of Alternatives Report* and the *Streetcar Plan Set* provide additional details on changes to traffic operations at intersections under the Streetcar Alternative.
- **Bicycle and Pedestrian Improvements.** There would be no change in bicycle and pedestrian improvements under the Streetcar Alternative, compared to the No-Build Alternative, except as noted in the following segment-by-segment description.

Bus Capital Improvements. Under the Streetcar Alternative, all 26 bus stops that would be served by Line 35 on Highway 43 between downtown Lake Oswego and the Sellwood Bridge and on SW Macadam Boulevard north of SW Corbett Street under the No-Build Alternative would be removed, because Line 35 service would be replaced in the corridor by streetcar service. The bus stops served by Line 35 between Lake Oswego and Oregon City would be unchanged under the Streetcar Alternative, compared to the No-Build Alternative. In addition, under the Streetcar Alternative, the Lake Oswego Transit Center would be relocated to be adjacent to the Lake Oswego Terminus Station, from its existing location on 4th Street, between A and B avenues. The capital improvements under the Streetcar Alternative would not vary by any of the design options under consideration.

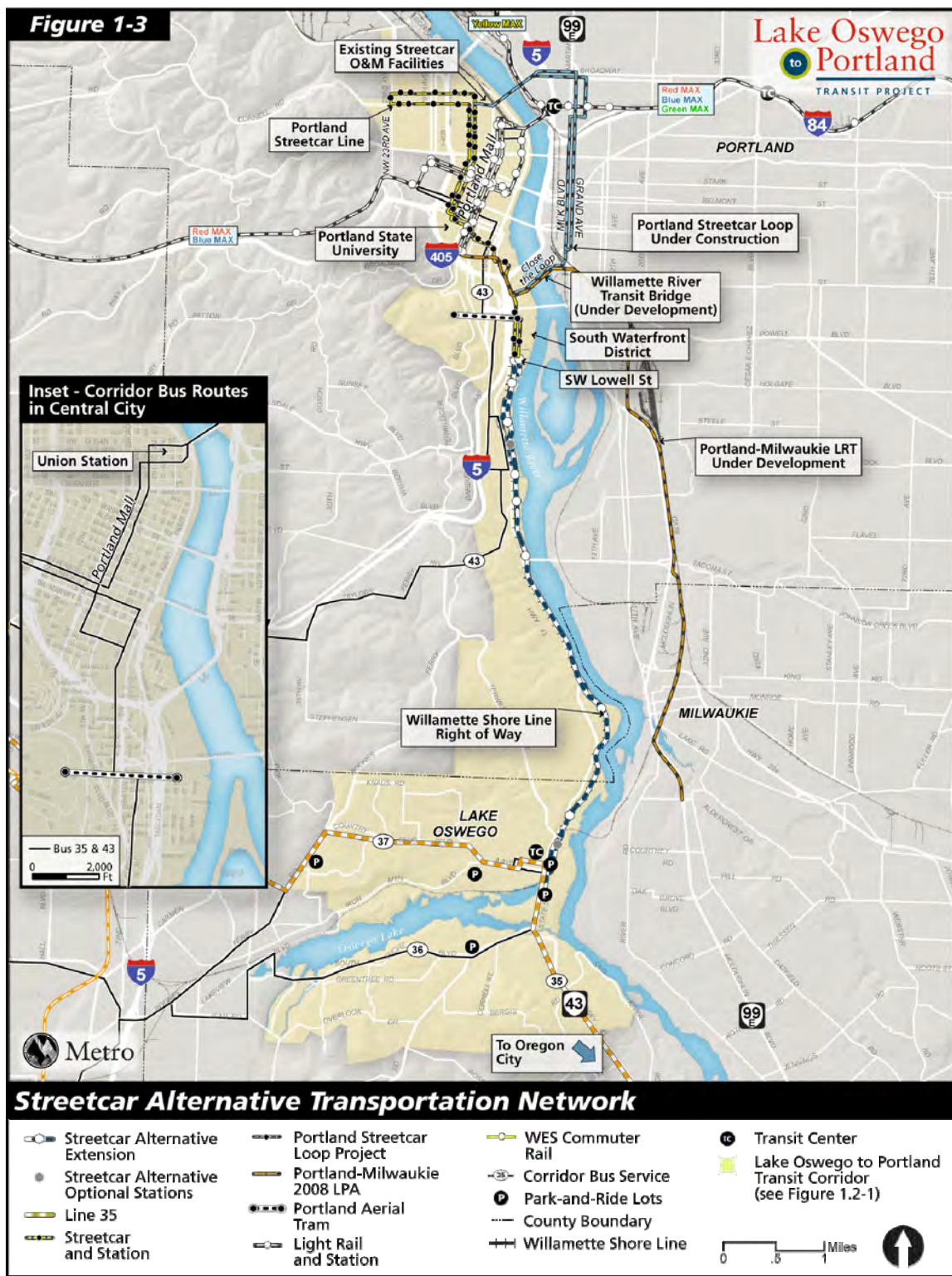


FIGURE 1-3 STREETCAR ALTERNATIVE TRANSPORTATION NETWORK

- **Light Rail Capital Improvements.** There would be no change in light rail capital improvements under the Streetcar Alternative, compared to the No-Build Alternative.
- **Interim Excursion Trolley Capital Improvements.** Under the Streetcar Alternative, there would no longer be an operating and maintenance agreement between the City of Lake Oswego and the Willamette Shore Line Consortium that would allow for the operations of the excursion trolley between SW Bancroft Street and Lake Oswego. Further, the Oregon Electric Railway Historical Society would no longer operate the vintage excursion trolley on the Willamette Shore Line alignment under agreement with the City of Lake Oswego, as they currently do and as they would under the No-Build and Enhanced Bus Alternatives.
- **Streetcar Improvements and Vehicles.** The Streetcar Alternative would extend streetcar tracks and stations south from the existing Portland Streetcar line that operates between NW 23rd Avenue and SW Bancroft Street. Compared to existing conditions and the No-Build Alternative, the Streetcar Alternative would add approximately 5.9 to 6.0 one-way miles of new streetcar tracks and catenary (overhead electrical wiring and support) and ten new streetcar stations between SW Bancroft Street and Lake Oswego. Except when crossing over waterways, roadways, or freight rail lines or through an existing tunnel, the new streetcar line would generally be at the same grade as existing surface streets. Of the approximately six miles of new streetcar tracks, 5.3 miles would be double-tracked (i.e., two one-way tracks) and 0.7 miles would be single-tracked (i.e., inbound and outbound streetcars would operate on the same tracks; see Figure 1-4 for an illustration of the location of single and double-track segments). The new streetcar stations would be of a design similar to the existing streetcar stations in downtown Portland and the Pearl District.
- **Park-and-Ride Facilities.** In addition to the park-and-ride facilities included under the No-Build Alternative, the Streetcar Alternative would include: a) a 100-space surface park-and-ride lot served by the proposed streetcar line at the B Avenue Station; and b) a 300-space structured park-and-ride lot that would be served by the proposed streetcar line at the Lake Oswego Terminus Station. The size and location of these park-and-ride lots would not vary by any of the design options under consideration.
- **Operations and Maintenance Facilities.** With the Streetcar Alternative, a new storage facility that would accommodate eight streetcars would be located adjacent to the streetcar alignment under the Marquam Bridge. The size and location of the streetcar operating and maintenance facilities would not vary by any of the design options under consideration.

B. Segment by Segment Description and Design Option Differences

For the purposes of description and analysis, the Lake Oswego to Portland Corridor has been divided into six segments for the Streetcar Alternative – those segments and design options within three of the segments are illustrated schematically in Figure 1-4. Figure 1-3 illustrates the proposed roadway improvements, streetcar alignment, stations, and park-and-ride lots that would occur in the corridor under the Streetcar Alternative. Figures 1-5 and 1-6 provide more detailed illustrations of the streetcar design options currently under study.

1. Downtown Portland Segment. There would be no roadway or bicycle and pedestrian improvements within the Downtown Portland Segment under the Streetcar Alternative, compared to

the No-Build Alternative. Under the Streetcar Alternative, a connection would be added between westbound streetcar tracks on SW Market Street to southbound tracks on W 10th Avenue, which would allow inbound streetcars from Lake Oswego to turn back toward Lake Oswego, providing increased operational flexibility. There are no streetcar alignment design options within this segment and there would be no new streetcar stations within this segment.

2. South Waterfront Segment. The South Waterfront Segment extends between SW Lowell Street to SW Hamilton Court. Streetcar tracks would be extended south of their existing southern terminus at SW Lowell Street, within the right of way of the planned Moody/Bond Couplet extension, to SW Hamilton Street. There would be two new streetcar stations within this segment (Bancroft and Hamilton stations).

3. Johns Landing Segment. The Johns Landing Segment extends between SW Hamilton Court to SW Miles Street. This segment includes three design options: Willamette Shore Line; Macadam In-Street; and Macadam Additional Lane. Under all options, the streetcar alignment would extend south from SW Hamilton to near SW Julia Street, generally within the existing Willamette Shore Line right of way. The three design options would include two new streetcar stations at varying locations, described below. To the south, all three options would share a common alignment between SW Carolina and SW Miles Street, generally via the existing Willamette Shore Line right of way, and they would share one common station at SW Nevada. Following is a description of how the design options would differ:

- a. ***The Willamette Shore Line Design Option*** would continue the extension of streetcar tracks south within the existing Willamette Shore Line right of way from SW Julia Street to SW Carolina Street (extending to SW Miles Street). There would be three new streetcar stations (Boundary, Nebraska, and Nevada stations).
- b. ***The Macadam In-Street Design Option*** would locate the new streetcar tracks generally within the existing outside lanes of SW Macadam Avenue, approximately between SW Boundary and Carolina streets. Between approximately SW Julia and Boundary streets, the streetcar alignment would be within the right of way of SW Landing Drive, which would be converted from a private to a public street. There would be three new streetcar stations (Boundary, Carolina, and Nevada stations). An optional station at Pendleton Street is also under consideration.

Segments

Design Options

Single-Track Sections

(All others are double-track sections)

Yellow = Short-Term Single Track

Red = Long-Term Single Track

1 - Downtown Portland

2 - South Waterfront

3 - Johns Landing

Willamette Shore Line
Macadam Additional Lane
Macadam In-Street

4 - Sellwood Bridge

5 - Dunthorpe/Riverdale

Willamette Shore Line
Riverwood

6 - Lake Oswego

UPRR Right of Way
Foothills

SW Lowell Street

SW Hamilton Ct

SW Miles Street

Sellwood Bridge

South End of Park

South End of Park to Short Trestle
(1,500')

Elk Rock Tunnel
(1,400')

SW Briarwood Rd

UPRR Right of Way
(1,500')

Lake Oswego Terminus



Streetcar Alternative Design Option Locations

Figure 1-4

FIGURE 1-4 STREETCAR ALTERNATIVE DESIGN OPTION LOCATIONS

- c. ***The Macadam Additional Lane Design Option*** would be similar to the Macadam In-Street Design Option, except that the new northbound streetcar tracks would be located within a new traffic lane just east of the existing general purpose lanes – streetcars would share the new lane with right-turning vehicles. Between approximately SW Julia and Boundary streets, the streetcar alignment would be within the right of way of SW Landing Drive, which would be converted from a private to a public street. There would be three new streetcar stations (Boundary, Carolina, and Nevada stations). An optional station at Pendleton Street is also under consideration.

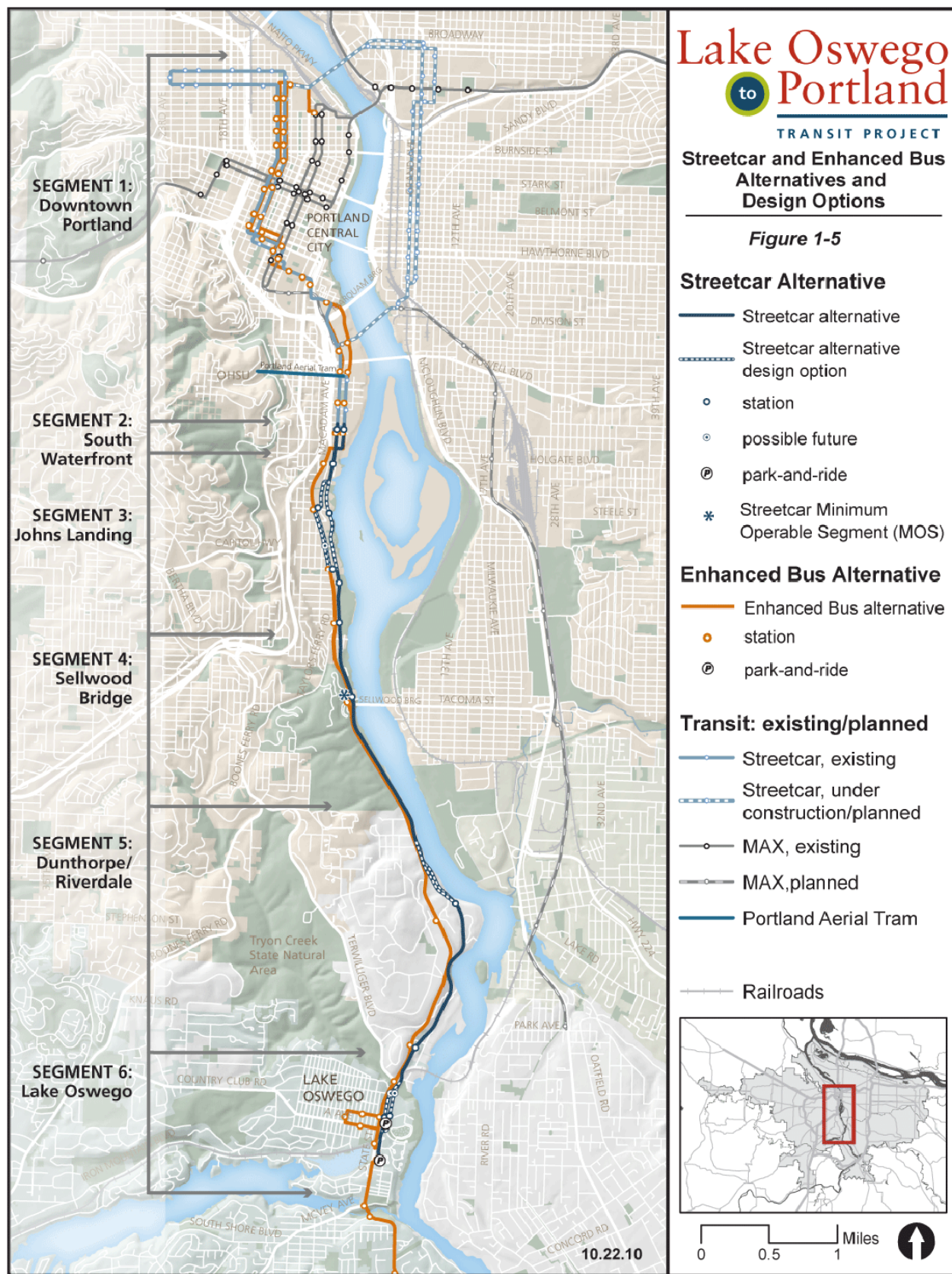


FIGURE 1-5 STREETCAR AND ENHANCED BUS ALTERNATIVES AND DESIGN OPTIONS

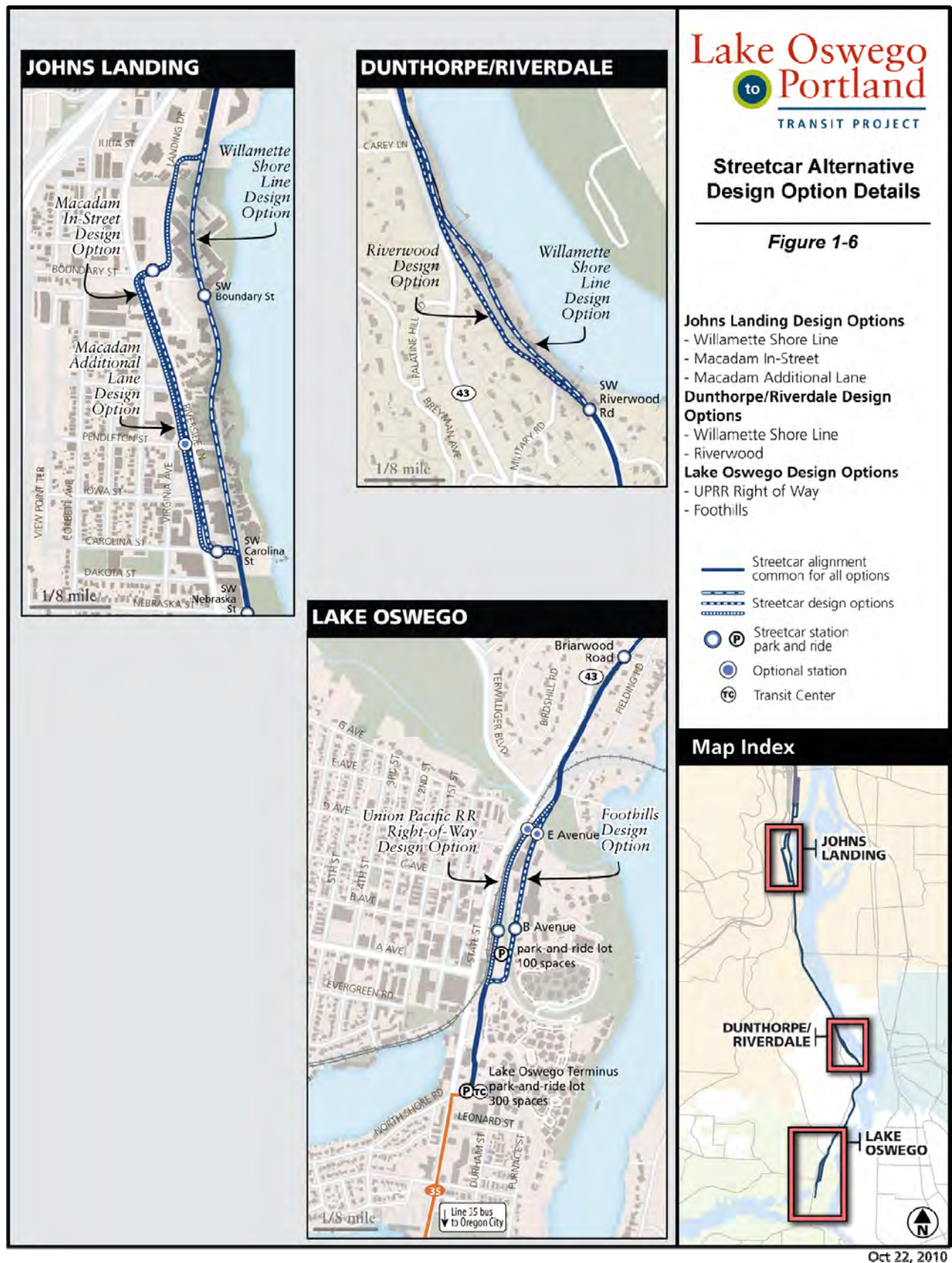


FIGURE 1-6 STREETCAR ALTERNATIVE DESIGN OPTION DETAILS

4. Sellwood Bridge Segment. The Sellwood Bridge Segment extends from Miles Street to the southern end of Powers Marine Park. Generally, the streetcar alignment would be located in the Willamette Shore Line right of way, except for the area between Stephens Creek and approximately 1,200 feet south of the Sellwood Bridge. In this area, the streetcar alignment would be constructed in conjunction with the planned west interchange improvements with the Sellwood Bridge (the streetcar would be located slightly east of the existing Willamette Shore Line right of way). The design and construction of the streetcar alignment under this design option would be coordinated with the design and construction of the new interchange for the Sellwood Bridge. There would be one new streetcar station within this segment (Sellwood Bridge Station).

5. Dunthorpe/Riverdale Segment. The Dunthorpe/Riverdale Segment extends between the southern end of Powers Marine Park and SW Briarwood Road. There are two design options in this segment: Willamette Shore Line Design Option and Riverwood In-Street Design Option. Both options would share a common alignment within the Willamette Shore Line right of way, generally north of where SW Riverwood Road intersects with Highway 43 and generally south of the intersection of SW Military Road and SW Riverwood Road. One new streetcar station is proposed within this segment, generally common to both design options (Riverwood Station). Following is a description of how the design options would differ:

- a. ***The Willamette Shore Line Design Option*** would generally locate the new streetcar alignment in the existing Willamette Shore Line right of way between the intersections of SW Riverwood Road and Highway 43 and SW Riverwood Road and SW Military Road.
- b. ***The Riverwood In-Street Design Option*** would locate the new streetcar alignment generally adjacent to Highway 43, south of SW Riverwood Road, and within the right of way of SW Riverwood Road, generally between where it intersects with Highway 43 (that intersection would be closed) and where it intersects SW Military Road. Except for the closure of the Highway 43 and SW Riverwood Road intersection, SW Riverwood Road would remain open to traffic with joint operation with streetcars.

6. Lake Oswego Segment. The Lake Oswego Segment extends between SW Briarwood Road and the Lake Oswego Terminus Station. There are two design options within this segment: the UPRR ROW design option and the Foothills Design Option. Both options would generally be the same in two sections: 1) the new streetcar line alignment would extend south from SW Briarwood Road to where the alignment would cross under the existing UPRR tracks; and 2) the new streetcar alignment would be located within a new roadway that would extend south from SW A Avenue to the alignment's terminus near the intersection of N State Street and Northshore Road. Both options would provide for a new bicycle and pedestrian connection under the existing UPRR tracks. There would be two stations within this segment, one that would be common to the two design options (Lake Oswego Terminus Station). An optional station at E Avenue is also under consideration.

This segment would include two park-and-ride lots, both of which would be generally common to the two design options. Following is a description of how the design options would differ:

- a. ***The UPRR ROW Design Option*** would extend the streetcar alignment south, generally in the UPRR right of way, from its under crossing of the existing UPRR tracks to SW A Avenue.

The B Avenue Station would be located on the west side of the 100-space surface park-and-ride lot.

- b. ***The Foothills Design Option*** would extend the streetcar alignment south from its under crossing of the UPRR tracks to SW A Avenue generally within the right of way of a new general purpose roadway (Foothills Road), which would be built as part of the Streetcar Alternative.

1.4.3.2 Transit Operations

This section describes transit operations under the Streetcar Alternative, generally compared to the No-Build Alternative (see Table 1-2). Figure 1-3 provides an illustration of the transit lines in the vicinity of the corridor under the Streetcar Alternative. There would be no difference in transit operations under any of the design options under consideration.

The Streetcar Alternative would extend the existing Portland Streetcar line from its current southern terminus at Lowell Street to the Lake Oswego Terminus Station in downtown Lake Oswego, expanding the streetcar length from 4 miles to 9.9 to 10 miles (depending on design option). The total round trip running time of the streetcar line between 23rd Avenue and downtown Lake Oswego (10 miles) in 2035 would be 105 or 112 minutes, excluding layover (based on the Willamette Shore Line and Macadam design options in the Johns Landing Segment, respectively). In comparison, under the No-Build Alternative the round trip running time for the streetcar line between 23rd Avenue and Lowell Street (4 miles) would be 68 minutes.

With the extension of streetcar service to Lake Oswego, Line 35 service between Lake Oswego and downtown Portland would be eliminated. The remainder of Line 35 between Oregon City and Lake Oswego would be combined with Line 78, in effect to create a new route between Oregon City and Beaverton. The new bus route and other TriMet transit routes serving downtown Lake Oswego would be rerouted to serve the relocated Lake Oswego Transit Center, which would be adjacent to Lake Oswego Terminus Station.

1.4.3.3 Construction Phasing Options

This section summarizes Streetcar Alternative construction phasing options currently under consideration – neither the No-Build Alternative nor the Enhanced Bus Alternative include construction phasing options. Currently, there are two types of construction phasing options or scenarios under consideration: 1) finance-related and 2) external project related. The Streetcar Alternative evaluated in this Technical Report and the DEIS is as Full-Project Construction. Should the Streetcar Alternative with phasing be selected as the Locally Preferred Alternative, during preliminary engineering (PE) additional analysis of environmental impacts resulting from the interim project alignment (as opposed to Full-Project Construction) will be conducted and additional opportunity for public review and comment may be required.

A. Finance-Related Phasing Options

Following is a description of the two finance-related phasing options currently under consideration.

- **Full-Project Construction.** Under the first construction phasing option, the project would be constructed and opened in its entirety as described within Section 2.2.2.
- **Sellwood Bridge Minimum Operable Segment (MOS).** Under the Sellwood Bridge MOS phasing option, the Streetcar Alternative would be initially constructed between SW Lowell Street and the Sellwood Bridge, with a second construction phase between the Sellwood Bridge and the Lake Oswego Terminus Station occurring prior to 2035. Under this construction phasing option, there would be no additional park-and-ride facilities in the corridor, compared to existing conditions. Under this phasing option, Line 35 would operate between Oregon City and the Nevada Street Station; frequencies would be adjusted to meet demand. Service and bus stops served exclusively by Line 35 would be deleted between the Nevada Station and downtown Portland.

B. External Project Coordination Related Phasing Options

Following is a description of phasing options related to the coordination of the Streetcar Alternative, if it is selected as the LPA, and other external projects. These external project coordination related phasing options represent interim steps in the construction process that would be taken to implement the Streetcar Alternative.

- **South Waterfront Segment Phasing Options.** If the planned and programmed South Portal roadway improvements are not in place or would not be constructed concurrently with the Streetcar Alternative, there would be two options for proceeding with construction of the streetcar alignment in the segment: 1) a different streetcar alignment using the Willamette Shore Line right of way would be initially constructed within the South Waterfront Segment; or 2) the streetcar alignment and its required infrastructure improvements would be constructed consistent with the alignment under the Full-Project Construction phasing option, but other non-project roadway improvements would be constructed at a later date by others. If the Willamette Shore Line right of way were to be used, then, when the South Portal roadway improvements were made, the streetcar alignment would be reconstructed consistent. The transit operating characteristics of the Streetcar Alternative would not be affected by this phasing option.
- **Sellwood Bridge Segment Phasing Options.** The Sellwood Bridge Segment includes two phasing options for the Streetcar Alternative that reflect two potential phasing options or scenarios for construction of the project in relationship to construction of a proposed new interchange that is planned to occur with the Sellwood Bridge replacement project. If the new interchange is constructed prior to or concurrently with the Streetcar Alternative, the initial and long-term streetcar alignment would be based on the new interchange design. The new interchange design is the basis for the analysis in this technical report and the DEIS. If the proposed interchange is constructed after the Streetcar Alternative, then the initial streetcar alignment to be constructed would be in the Willamette Shore Line right of way. Subsequently, when the proposed interchange is constructed, the Sellwood Bridge replacement project would relocate the streetcar alignment with the new interchange design. Therefore, the long-term streetcar alignment would be the new interchange and the Willamette Shore Line phasing option would only be implemented as an interim alignment. Therefore, the two design options in this

segment do not constitute a choice of alignments – instead they represent two construction phasing scenarios, dependent upon how external conditions transpire.

- The Foothills Design Option. The Foothills design option of the Streetcar Alternative is based on roadway improvements that would occur under the City of Lake Oswego's Foothills redevelopment project. If those roadway improvements are not constructed prior to or concurrently with construction of the streetcar alignment, then the Lake Oswego to Portland Transit Project would construct the streetcar alignment and required infrastructure improvements using the same alignment and the roadway improvements would be added at a later date by others.

2. METHODOLOGY

2.1 Introduction

Section 106 of the National Historic Preservation Act of 1966 requires that impacts of federally assisted projects be examined for impacts to historic districts, sites, buildings, structures, or objects, and archaeological sites listed on, or eligible for inclusion in the National Register of Historic Places. Federal agencies must coordinate with the SHPO before undertaking projects that affect such properties. The Advisory Council for Historic Preservation (ACHP) has established procedures for the protection of historic and cultural properties that are on, or determined to be eligible for inclusion in the National Register (36 CFR 800). There are also Oregon statutes that protect archaeological sites on both private and public lands. The analysis, documentation and coordination are being conducted to satisfy Section 106 requirements for the Lake Oswego to Portland Streetcar Project DEIS.

The purpose of the historic, archaeological and cultural resources analysis is to identify resources and assess the potential impacts of the various project alternatives on known and potential historic, archaeological and cultural resources. Issues identified relate to the numbers and types of resources and their relative locations in relationship to the study alternatives.

2.2 Related Federal, State, and Local Regulations

The following regulations are considered in the historic, archaeological and cultural analysis:

- National Environmental Policy Act (NEPA) of 1969
- National Historic Preservation Act (NHPA) of 1966 (P.L. 102-575; 16 U.S.C. 470), as amended. 36 CFR 800. 40 CFR 1508.27. Executive Order 11593. Secretary of Interior Standards
- National Register Standards for eligibility regulation (36 CFR 60.4)
- U.S. Department of Transportation (DOT) Act of 1966 (49 U.S.C. 1653, 23 U.S.C. Section 138), Section 4(f), as amended)
- Antiquities Act of 1906 (P.L. 59-209; 16 U.S.C. 431-433)
- Historic Sites Act of 1935 (16 U.S.C. 461-467)
- Protection and Enhancement of the Cultural Environment of 1971 (Executive Order 11593)
- Oregon SHPO regulations
- Oregon statutes that address Indian burials (ORS 97.740) and archaeological sites (ORS 358.905 and 390.235)
- Oregon Statewide Planning Goal 5 (Oregon Administrative Rule [OAR] 660-015-0000) Natural Resources, Scenic and Historic Areas, and Open Spaces. Oregon's Statewide Planning Goals and Guidelines. OAR 660-015-0000. Amendments effective 08/30/96
- Clackamas County Comprehensive Plan and standards related to historic resources
- Multnomah County Comprehensive Plan and standards related to historic resources
- Portland and Lake Oswego plans and standards related to historic resources

2.3 Contacts and Coordination

Federal, state, and local agency contacts and coordination are described in Section 3 of this report. Agencies involved include Metro, Tri-Met, the Oregon Department of Transportation (ODOT), SHPO, Clackamas County, Multnomah County, and the cities of Portland and Lake Oswego.

2.4 Inventory of the Affected Environment

The APE is defined as the tax parcels adjacent to either side of the proposed alternatives, as well as the rail alignment itself. In areas with a defined grid street pattern, such as parts of Johns Landing in Portland and downtown Lake Oswego, this is effectively one half-block on either side of the proposed alternatives. In areas outside a defined grid street pattern, such as within Powers Marine Park and in the Dunthorpe neighborhood, this includes the parks along the proposed alignment as well as the residences next to the proposed alignment – the areas in which impacts would be most likely to occur.

2.4.1 Historic Resources

An inventory of all resources that will be at least 50 years old by the time construction is anticipated to begin is included in this report (see Appendix A). This includes historic resources that are listed on the National Register of Historic Places (NRHP) or determined to be eligible for the NRHP through the Section 106 Determination of Eligibility process, as well as buildings that are old but determined to be not historic. Resources that have been determined to be not eligible for the NRHP through the Section 106 Determination of Eligibility process are included in this report to ensure that no potentially historic resources were overlooked. The methods for developing the inventory and determining eligibility included the following steps.

- Tax assessor's records were reviewed to develop a preliminary list of resources within the API that were at least 45 years old at the time when the research was begun (i.e. anything built before 1964).
- Pedestrian field studies were conducted to verify the list of resources that met the age requirement and to photograph and document all resources that met the age standard.
- City, county, and state historic resource inventories were consulted, including:
 - City of Portland Historic Resource Inventory (1984)
 - City of Lake Oswego Cultural Resources Inventory (1989)
 - Clackamas County Cultural Resource Survey (1983-84)
 - State of Oregon inventory of historic properties
- Oregon SHPO records were consulted to determine which resources are listed on the NRHP and which resources have been determined eligible for the NRHP by previous projects.
 - The three resources that were previously determined eligible by other projects – the Sellwood Bridge, the Southern Pacific Red Electric eastside line, and Riverview Cemetery – were all relatively unchanged from the time when they were determined eligible, so they were not re-evaluated. Their eligibility status is assumed to remain the same. (See Appendix B for copies of those forms)
- Archival research was conducted to develop an area-wide context statement as well as brief histories for each of the resources for which a Determination of Eligibility form was completed. Research materials could included historical maps, city directories, newspaper articles, books, and other available sources (see the bibliography for a complete list of materials consulted).

- All resources that met the minimum age standard were recorded in a Reconnaissance Level Survey (RLS). The results for the RLS are in Appendix A of this report. The resource's age, appearance, historic integrity, and condition were noted. Roughly two-thirds of the potential resources were found to have been subjected to such significant alterations that they were found to be not eligible for listing on the NRHP. Those alterations were documented in the RLS inventory and no further research or assessment was conducted on these properties.
- Resources that appeared to be potentially eligible for the NRHP or that required further research and documentation were subjected to an Intensive Level Survey (ILS). The results of the ILS are in Appendix A. The ILS documentation includes more detailed information about the original appearance of the resource, any known alterations, a brief history of the resource, and a statement of significance (or, in the cases where the resource was found to be not potentially eligible, a description of why the resource failed to meet eligibility standards).

2.4.2 Archaeological Resources and Traditional Cultural Properties

- A comprehensive records search at Oregon SHPO to gather data on any archaeological surveys or related studies was conducted along the entire proposed alignment, including all options currently under consideration.
- A review of historical cartographic materials, photographs, and other documents for new project areas/alignments not previously reviewed in detail was conducted. This review identified locations considered to be likely to have associated historic period archaeological resources.
- A field reconnaissance of the project area to assess current conditions and supplement the archival research in determining if any of these areas should be considered high-probability locations for archaeological resources was conducted.
- Federal, state and local jurisdictions, such as the State Historic Preservation Officer, Tribal Historic Preservation Officers and county and city planning departments, were contacted for the most current inventories of historic and cultural resources within the corridor. (see Section 3 of this report for details on agency coordination)
- Archival research was completed where necessary to document known resources.
- Field studies were conducted to identify potential resources not previously included in local inventories and to review locations and condition of previously recorded resources.
- FTA has undertaken coordination and consultation with the appropriate communities, including but not limited to Native American Tribes, to determine if there are traditional cultural properties in the project area.

2.5 Environmental Consequences

2.5.1 Historic Resources

For the DEIS phase of the NEPA analysis, direct (including construction), indirect, and cumulative impacts of the project alternatives are described and evaluated in the results report. This evaluation includes a preliminary assessment of whether any of the project alternatives would be likely to adversely affect a historic resource, and whether there may be mitigation strategies to lessen or avoid adverse impacts. Potential impacts are evaluated in general terms unless there is a particular impact or a specific property that is significant enough to warrant individual treatment. The impact description and evaluation are presented in a way that allows the reader to compare and contrast the

project alternatives. Because many aspects of the designs for the proposed alternatives and design options have not been developed at this point, a complete evaluation of potential effects cannot be made. Consultation and coordination with the SHPO has been ongoing to ensure that the evaluation of historic resources and potential impacts to those resources is accurate.

After a preferred alternative is selected, for the FEIS phase of the NEPA analysis, the project design will be refined to include the necessary details for a complete evaluation of potential effects. At that point, potential effects of the preferred alternative on each historic resource will be fully described and evaluated. SHPO concurrence with the effect findings will be sought during this later phase of the project, and mitigation measures will be more completely developed at this point.

2.5.2 Archaeological Resources and Traditional Cultural Properties

For the DEIS phase of the NEPA analysis, direct (including construction), indirect, and cumulative impacts of the project alternatives are described and evaluated in this report. This evaluation includes a preliminary assessment of whether any of the project alternatives would be likely to adversely affect an archaeological resource, and whether there may be mitigation strategies to lessen or avoid adverse impacts. Consideration of Traditional Cultural Properties is addressed, based on results of agency consultation with pertinent communities, including, but not limited to, Native American groups. Potential impacts are evaluated in general terms (not on a resource-by-resource basis) unless there is a particular impact or a specific property that is significant enough to warrant individual treatment. The impact description and evaluation is presented in a way that allows the reader to compare and contrast the project alternatives.

2.6 Mitigation Measures

Potential mitigation measures and design recommendations are identified and described in this report. These measures do not represent a commitment on the part of the project, nor is the list of potential mitigation measures complete. The measures are provided as an initial list of actions that could be taken to ensure that the proposed project is compatible with the surrounding area and in compliance with all applicable laws and policies. Additional measures may be identified during the course of agency coordination and public involvement. After public and agency comments have been reviewed, a more complete list of mitigation measures will be developed for publication in the FEIS.

2.7 Section 4(f) Evaluation(s)

The Streetcar Alternative would require the use of the Southern Pacific Red Electric eastside line, an historic resource. Depending on future design refinements, this use may result in an adverse impact to the resource, although that finding is not definitive. The No Build and Enhanced Bus Alternatives would not directly impact the Red Electric line but by not using the line for future rail purposes, they could indirectly result in adverse impacts to the line. A preliminary Section 4(f) evaluation for impacts to the rail line has been prepared. The Section 4(f) evaluation is separate from the Cultural Resources Results Report; methods and findings associated with the Section 4(f) analysis are discussed in the Section 4(f) report.

2.8 Documentation

This results report documents the methods used for the project; precontact and historic context of the project area; historic resources within the project APE; resources that were evaluated and determined to be not historic; potential impacts to historic resources; a preliminary assessment of the level of

impacts; and recommended mitigation measures. The presence of known archaeological sites within the APE are noted in the results report. Due to their sensitive nature, their locations are not disclosed in this report; this information will not be available for public review, but will be filed with the SHPO.

2.9 References

All primary and secondary sources are listed as references in bibliographical format in Section 7 of this report. All newspapers, books, interviews, reports, papers, inventories, National Register Nominations, and miscellaneous data are included.

3. AGENCY COORDINATION AND INVOLVEMENT

Copies of agency coordination letters are included in Appendix D.

3.2 State

FTA sent a letter to the SHPO on 13 October 2009 to provide a notice of federal undertaking. The letter included the proposed APE and stated that the methods report was available for SHPO review. No response was received from the SHPO.

On 28 October 2009, Martha Richards, cultural resources consultant, contacted the SHPO to obtain the project number and a copy of the Historic Sites Inventory database.

On 15 April 2010, representatives from FTA, Metro, and URS met with the SHPO representative to conduct a field visit of the project area. This visit included discussions about the proposed project, historic resources in the area, and questions about potential eligibility of specific properties.

In June 2010, FTA provided SHPO with the results of the RLS and ILS and requested concurrence. For background information, preliminary assessments of effect were also included. On July 6, 2010, SHPO provided a letter of concurrence on eligibility on 90 properties. Concurrence on levels of effect will not be requested until after a preferred alternative is selected and the design is refined to the point where the full extent and nature of potential effects are known.

3.3 Local

No local coordination has occurred.

4. AFFECTED ENVIRONMENT

4.1 Historic Context

4.1.1 Southern Pacific Red Electric eastside line

The rail corridor that would be used for the Streetcar Alternative is a segment of the Southern Pacific Red Electric eastside line. Construction of a narrow gauge rail line between Dundee and Portland was begun in 1885 and completed in 1887. Initially, it was run by the Portland & Willamette Valley Railroad but the railroad company was soon acquired by Southern Pacific. When the railroad was constructed, the roadway network was minimal (or nonexistent), so this railroad was an important improvement over river transport, which required cargo or passengers to be unloaded from boats that could travel on shallow streams and canals and reloaded onto larger ships that would travel on the Willamette River. Around 1892, the narrow gauge railroad was converted to a standard gauge. Both passenger and freight trains used the rail line, although it was used more heavily by freight than by passenger trains.

During the early part of the twentieth century, Southern Pacific developed a plan to build a network of interurban lines into the Willamette Valley to hasten settlement and development of the area. This was partly in response to a threat from the Oregon Electric Railway, which had the potential to become a serious competitor for both freight and passenger rail. Southern Pacific's plan involved a passenger line that began at Union Station in downtown Portland, traveling down 4th Avenue to Jefferson Street. At Jefferson Street, the line split. The eastside line traveled east on Jefferson and then turned south along the waterfront. It continued south to Oswego (now known as Lake Oswego) on the existing rail lines, then turned west just before the Duck Pond (now known as Lakewood Bay) and ran along the north shore of Oswego Lake. From there, it headed southwest through Tualatin, Sherwood, and Newberg before heading north at St Joseph (just north of McMinnville) up through Carlton and Forest Grove. It then curved east through Hillsboro and Beaverton before returning to Union Station via what is now Bertha and Barbur Boulevards. While parts of this line are still extant, other segments have been vacated or converted to roadways.

Southern Pacific's passenger service increased during the early part of the twentieth century, in part because of the increasing population in the Willamette Valley and in part because of the rise in popularity of Oswego Lake as a destination for outdoor recreation for the city dwellers of Portland. The line was electrified in 1914 in response to restrictions on steam locomotives in downtown Portland (merchants complained about the noise and air pollution associated with steam locomotives), with the power lines hung higher than usual (22 feet above the tracks) to allow steam-powered freight trains to use the same tracks outside the downtown core. Standard pole spacing was 150 feet, except on sharp curves. The cars used on Southern Pacific's interurban lines were a distinctive bright red and became known as the Red Electrics.

The Red Electric provided fast and convenient access between Portland and Oswego and points beyond. There were thirteen (13) stations between Portland and Lake Oswego, ranging from the grand Union Station in downtown Portland to stations that were little more than formalized places to stand and wait. Union Station still exists, as do the concrete steps leading up to Riverwood Station near 11445 SW Riverwood Road, but all of the other stations have been demolished and there are few, if any, signs of their existence. The close spacing of the stations provided convenient access for commuters: oral histories from the Riverwood and Briarwood neighborhoods included a number of references to former residents whose daily commute to Portland began with a short walk to a nearby station. Indeed, many of the residential areas in Lake Oswego and along the rail corridor were made

possible by the rail line. Roads were poor or nonexistent in the area. Lake Oswego's boulevard system was laid out in the early 1910s but not fully built until the 1930s. With the exception of the Riverview Cemetery, all of the historic resources surveyed for this report were built after the rail line was in place, and almost half were built during the period when the rail line was used for passenger service.

As automobiles became increasingly popular and roads were built and paved, usage of the Red Electric declined. The wholesale development of the Willamette Valley never materialized to the degree that Southern Pacific had envisioned when they planned their interurban lines. Southern Pacific ceased passenger service on the line in 1929 and removed the electric lines and poles around 1930. Segments of the western leg of the loop were dismantled, the eastern leg – the portion that would be used by the proposed project – was retained for freight service. Freight service had never entirely ceased on the line, but because the frequent passenger trains were given priority, freight often used alternate routes during the period of the Red Electrics. Freight trains used the line until 1983, after which time Southern Pacific sold the rail line to Willamette Shoreline Consortium. Since that time, the Oregon Electric Railway Historical Society has been running the Willamette Shore Trolley on the line.

4.1.2 Fulton area

The northern portion of the project area – Segments 1 through XX – is within the southern boundaries of the Portland City Limits and is generally part of the Fulton neighborhood. Much of the Johns Landing area that is now developed with waterfront condominiums and apartments was originally developed with lumber mills and furniture makers. The river was used for transporting logs, so the riverfront property was very important to the mills that relied on a steady supply of logs.

The area to the east of Macadam Avenue was residential, providing mainly working-class housing for millworkers and others with jobs in the city. The neighborhood still includes many old houses.

Most of the land within the APE has been redeveloped either recently, as a part of the South Waterfront redevelopment, or in the 1970s when the mill sites were transformed into Johns Landing.

4.1.3 Dunthorpe/Lake Oswego

In 1842, Albert Durham dammed Sucker Lake for use as a log pond and built a sawmill at the lake's outlet to the Willamette River. Over the years, he and others worked hard to develop a thriving industry for the developing area called Oswego. Sucker Lake – named for the numerous suckerfish that sport fishermen caught – was eventually renamed Oswego Lake, and the town of Oswego eventually became known as the city of Lake Oswego.

Until the rail line was built in 1887, Oswego Lake and a man-made canal to the Tualatin River provided an important transportation linkage to the Willamette River, and the area near Oswego Creek was an important transfer point for goods. This area later became the site of the Oregon Iron and Steel Company's furnace and foundry. The furnace's chimney can still be seen in George Rogers Park. The Oregon Iron and Steel Company started out as the Oregon Iron Company in 1865 after soil tests showed promising levels of ore in the area (Iron Mountain, located on the north side of Oswego Lake, was appropriately named). It was a charcoal-fired furnace, so the company acquired vast land holdings both for the timber that would be used to fire the furnace and for the ore that was mined from the soil. It was never a highly successful business: the coal-fired plants in the

upper Midwest could produce iron much more economically. Plus, Scottish ships that came to Portland to buy Oregon grain often used low-quality Scottish iron as ballast for their trip over, thus providing the Oregon markets with plenty of inexpensive iron.

The iron company changed hands a number of times over the years and had minor successes – the company won the contract to fabricate the water pipes to connect Portland to its Bull Run water supply in 1888 – but was never a highly profitable company.² Attempts to improve production and to increase capacity never succeeded in making the company competitive with the well-established coal-fired eastern steel mills. The smelting furnace that had been run intermittently throughout its history was extinguished for the last time in 1894, and the pipe foundry kept running on and off until 1928.

The iron company ran Oswego like a company town: most of the people who lived there worked in the mill or made charcoal and sold it to the mill on a contract basis. Transportation connections to Milwaukie, Portland and other communities was limited, so residents relied on the nearby stores and services for most of their needs. After the railroad was installed and a convenient link to Portland was established, Oswego began to be used as a recreational area for Portland residents eager to escape the city. It was close enough to be easily accessible for an easy day trip, yet far enough from the city to offer a bucolic setting for a lakeside picnic. The iron company, owner of most of the land around Oswego Lake, recognized the vacation potential of the area and appointed a lake caretaker in 1904. That caretaker set up a very successful boat rental business for the weekend tourists. In order to increase the amount of lakefront property and also to transform the lake from a marshy pit with unsightly stumps and logging debris into a bucolic recreational area, the company built a bigger dam and raised the level of the lake, transforming the clear cuts and pit mines into potentially valuable lakeside property.

As described above, the iron company was never a highly profitable enterprise, and its increasing debts were held mainly by the Ladd and Tilton Bank. In the early 1900s the bank experienced some significant problems which got so bad that the bank, desperate for funds, started selling land owned by the iron company in 1910. This move is not surprising: many of the same men who sat on the boards of both the iron company and the bank were also very experienced in real estate development.

One such person was William M. Ladd, son of William S. Ladd. William S. Ladd had been responsible for the creation of many of Portland's nicer neighborhoods, including Ladd's Addition, Eastmoreland, Irvington, and Laurelhurst. In 1908, William M. Ladd organized the Ladd Estate Company, likely in preparation for the acquisition and development of iron company land. In 1916 he filed a 125-acre plat for Upper Dunthorpe; he had clearly learned the recipe for creating an upscale development with highly-priced lots, as many of the lots came with deed restrictions that made residency off-limits to non-white people (unless, of course, they were servants) and requirements that future residents spend at least \$3,000 on house construction. That minimum cost essentially guaranteed that the houses would be designed by architects.

Not all of the land between Lake Oswego and Portland was owned by the iron company and developed with large-scale subdivisions. Wealthy citizens wishing to avoid the constraints of living within city limits and desiring a country estate with plenty of land had started to populate the

²Many of the iron company's board members also sat on the board of the Portland Water Bureau.

unincorporated area between Lake Oswego and Portland. Some of those estates still exist, such as the Peter Kerr estate at Elk Rock (now known as the Bishop's Close) at 11800 SW Military Lane, and the Lloyd Frank estate that is now Lewis and Clark College. Others have been subdivided and further developed over the years.

Other early residents of the unincorporated area between Lake Oswego and Portland developed their land for activities that were not necessarily permitted within city limits or acceptable close to populated areas. Military Road once led to a ferry landing at the Willamette River. The road to Fulton led north from this landing, and a roadhouse called the White House, owned by H.C. Leonard, was located in the vicinity. The White House was built in 1886 and featured a racetrack for horses, hotel rooms, a brothel, a gambling parlor and other such amenities. After it burned in 1904, Leonard sold the land to Henry L. Corbett who, in 1909, platted the land for residential uses. Riverwood Road was constructed and paved in 1910 in preparation for development of the land. Christopher Bruun bought the land from Corbett in 1910, further subdivided some of the lots, and built his house on one of the lots, becoming one of the first residents on that road.

The other main residential area within the project APE is Briarwood, or the area around Fielding Road. The history of Fielding Road is punctuated by floods. The road provides access to a low-lying piece of land on the west bank of the Willamette River, between the river and the Dunthorpe hills. Oral histories recorded in the book *Briarwood Remembered* all speak of the area's remoteness: in the early days, the area was connected to Oswego and Portland by the Red Electric line which runs parallel to Fielding Road, or by any of the numerous ferry landings located along the river banks. The road network was slow to develop, so early residents' oral histories spoke of a pioneering spirit and the importance of self-sufficiency due to their somewhat isolated location. Unlike other parts of Lake Oswego and its suburbs, Fielding Road properties did not appear to have the sorts of deed restrictions that led to high-end development. As a result, many of the early houses were more modest in size and style. Although some of the houses may have been built as vacation cottages, the oral histories suggest that most were built as primary residences.

Periodic flooding of the Willamette River, even just higher-than-usual water levels, has caused severe damage to many houses on Fielding Road throughout the years. Many of the older houses have been damaged and largely rebuilt or replaced after flooding. In addition, Fielding Road is now a highly desirable place to live and there is tremendous pressure to subdivide the large lots for in-fill development and to replace the original working-class housing with larger, more modern estates.

Pressure to develop or redevelop is not restricted to Fielding Road. The unincorporated area between Portland and Lake Oswego continues to be a highly desirable place to live, and many residents have felt the pressure to subdivide their expansive lots to make room for new development. As a result, there is no single period to which most of the houses in the APE date. The houses represent the full range of twentieth century architecture, while new houses continue to be constructed, bringing the area into the twenty-first century as well.

4.2 Historic Resources

There are twenty-four (24) historic resources in the study area. The locations of those resources are shown on figure 4-1. Eighty-nine (89) properties within the APE will be at least 50 years old in 2015, when construction is anticipated to occur, and each of those properties was evaluated for its potential eligibility for the NRHP. Table 4-1 lists all 89 properties and the preliminary evaluation of whether they are considered historic. Appendix A provides the results of the reconnaissance level

survey (RLS) and includes more details about the condition and degree of historic integrity of each property. Appendix C contains detailed location maps of each of the resources evaluated.

Of the 89 properties evaluated in the RLS, one (1) residence is individually listed on the NRHP. That house is the Sherrard-Fenton House located at 13100 SW Riverside Drive in Clackamas County. There are no historic districts in the study area. Three (3) properties – Riverview Cemetery, the Red Electric line, and the Sellwood Bridge – were previously determined eligible for listing on the NRHP by other recent projects. Copies of the Determinations of Eligibility for those resources are included in Appendix B. Twenty (20) properties were determined eligible for listing on the NRHP by this project. Intensive level survey forms (ILS) for each of those properties are included in Appendix A (also included in Appendix A are ILS forms for properties that were determined to be not historic, but that warranted more research and documentation than was provided by the RLS). Sixty-five (65) properties were determined to be not eligible for listing on the NRHP, either during the RLS or the ILS phase. Most of those had been significantly altered and no longer retained sufficient historic integrity to be considered historic.

The rail line itself was determined eligible for listing on the NRHP during the recent environmental analysis for the Sellwood Bridge Replacement Project. The determination of eligibility defined the Southern Pacific Railroad Red Electric Eastside Line (aka Jefferson Street Line) portion of the Red Electric lines as beginning at the intersection of SW Bancroft Street and SW Moody Avenue in southwest Portland and heading south 6 miles to 0.5 mile north of the intersection of N State Street and Foothills Road in Lake Oswego. It is unclear why the southern terminus was specified in this way, as the Red Electric line continued west along the north shore of Lakewood Bay and Oswego Lake, past Lake Grove and on to McMinnville. Those tracks were field-verified as existing to at least Lake Grove. The Elk Rock Tunnel and Riverwood Trestles (the long and short trestles in the vicinity of Riverwood Road) were described as important contributing elements. The determination of eligibility does not define the extent of the historic resource of the Red Electric any further, so for the purposes of this project, the eligibility has been assumed to include the existing rail-related features – tracks, ties, signs, signals, trestles, and stations – associated with this segment of the Red Electric line.

Table 4-1
National Register Status of Resources Surveyed in the Area of Potential Effect

Resource Address	Resource Type	National Register Status¹
3910-3930 SW Macadam Ave	Warehouse	not eligible
4000 SW Macadam Ave	Warehouse	eligible
4110 SW Macadam Ave	Warehouse	not eligible
4550-4600 SW Macadam Ave	Offices	not eligible
5200 SW Macadam Ave	Commercial	not eligible
5331 SW Macadam Ave	Offices	not eligible
6140 SW Macadam Ave	Commercial	not eligible
6328 SW Macadam Ave	Commercial	not eligible
6342 SW Macadam Ave	Commercial	not eligible
6626 SW Macadam Ave	Commercial	not eligible
6720 SW Macadam Ave	Commercial	not eligible
6840 SW Macadam Ave	Commercial	not eligible
6932 SW Macadam Ave	Commercial	not eligible
7330 SW Macadam Ave	Commercial	not eligible
7400 SW Macadam Ave	Commercial	not eligible
7520 SW Macadam Ave	Commercial	not eligible
7524 SW Macadam Ave	Commercial	not eligible
8240 SW Macadam Ave	Commercial	not eligible
8421 SW Macadam Ave	Riverview Cemetery	DOE
5511 SW Hood Ave	Commercial	not eligible
0753 SW Miles St	House	not eligible
0755 SW Miles St	House	not eligible
7423 SW Miles Pl	House	not eligible
7505 SW Miles Pl	House	not eligible
Willamette River Mile 16.5	Sellwood Bridge	DOE
10110 SW Riverside Dr	House	eligible
10150 SW Riverside Dr	House	not eligible
10224 SW Riverside Dr	House	not eligible
10234 SW Riverside Dr	House	eligible
10268 SW Riverside Dr	House	eligible
10400 SW Riverside Dr	House	not eligible
10609 SW Riverside Dr	House	eligible ²
11124 SW Riverside Dr	House	eligible
11930 SW Riverside Dr	House	not eligible
12020 SW Riverside Dr	House	eligible
12410 SW Riverside Dr	House	not eligible
13100 SW Riverside Dr	House	NRHP
13150 SW Riverside Dr	House	eligible
13180 SW Riverside Dr	House	not eligible
13200 SW Riverside Dr	House	not eligible
10808 SW Riverwood Rd	House	not eligible
10925 SW Riverwood Rd	House	not eligible
11075 SW Riverwood Rd	House	not eligible
11100 SW Riverwood Rd	House	eligible
11175 SW Riverwood Rd	House	eligible
11235 SW Riverwood Rd	House	eligible
11312 SW Riverwood Rd	House	not eligible

11322 SW Riverwood Rd	House	not eligible
11350 SW Riverwood Rd	House	not eligible
11385 SW Riverwood Rd	House	eligible
11388 SW Riverwood Rd	House	eligible
11445 SW Riverwood Rd	House	not eligible
11639 SW Riverwood Rd	House	not eligible
11701 SW Riverwood Rd	House	not eligible
11721 SW Riverwood Rd	House	not eligible
11745 SW Riverwood Rd	House	not eligible
11801 SW Riverwood Rd	House	not eligible
11821 SW Riverwood Rd	House	not eligible
11829 SW Riverwood Rd	House	not eligible
02473 SW Military Rd	House	eligible
02484 SW Military Rd	House	not eligible
11800 SW Military Ln	House	eligible
12870 SW Elk Rock Rd	House	not eligible
12950 SW Elk Rock Rd	House	not eligible
13060 SW Elk Rock Rd	House	not eligible
12770 SW Fielding Rd	House	eligible
13000 SW Fielding Rd	House	not eligible
13060 SW Fielding Rd	House	not eligible
13070 SW Fielding Rd	House	not eligible
13150 SW Fielding Rd	House	not eligible
13200 SW Fielding Rd	House	not eligible
13250 SW Fielding Rd	House	not eligible
13300 SW Fielding Rd	House	eligible
13348 SW Fielding Rd	House	not eligible
13382 SW Fielding Rd	House	not eligible
13392 SW Fielding Rd	House	eligible
13581 SW Fielding Rd	House	not eligible
13641 SW Fielding Rd	House	not eligible
13711 SW Fielding Rd	House	not eligible
20 SW Briarwood Rd	House	eligible
49 Briarwood Rd	House	eligible
50 Briarwood Rd	House	not eligible
51 Briarwood Rd	House	not eligible
311 N State St	Railroad Building	not eligible
141 N State St	Commercial	not eligible
117 N State St	Commercial	not eligible
47 N State St	Commercial	not eligible
27 S State St	Commercial	not eligible
Red Electric Eastside Line	Railroad	DOE

Source: Historic, Archaeological and Cultural Impacts Results Report, (TriMet and URS, February 2010)

¹ **NRHP** = Currently listed on the National Register of Historic Places;

DOE = Determination of Eligibility: Resource previously determined eligible for listing on the NRHP;

eligible = Resource that has been identified as potentially eligible for the NRHP; SHPO concurrence has been requested regarding this assessment.

not eligible = Resource that has been identified as not eligible for the NRHP and is therefore not considered historic for the purposes of this project; SHPO concurrence has been requested regarding this assessment.

² The house at 10609 SW Riverside Drive is located on the west side of Riverside Drive (OR 43), but the property extends east across the road to the Willamette River. The boundary of the historic resource is limited to the portion of the tax lot on which the house is located (i.e. the area on the west side of Riverside Drive); the remnant portions of the tax lot that are located on the east side of Riverside Drive are not part of the historic resource.

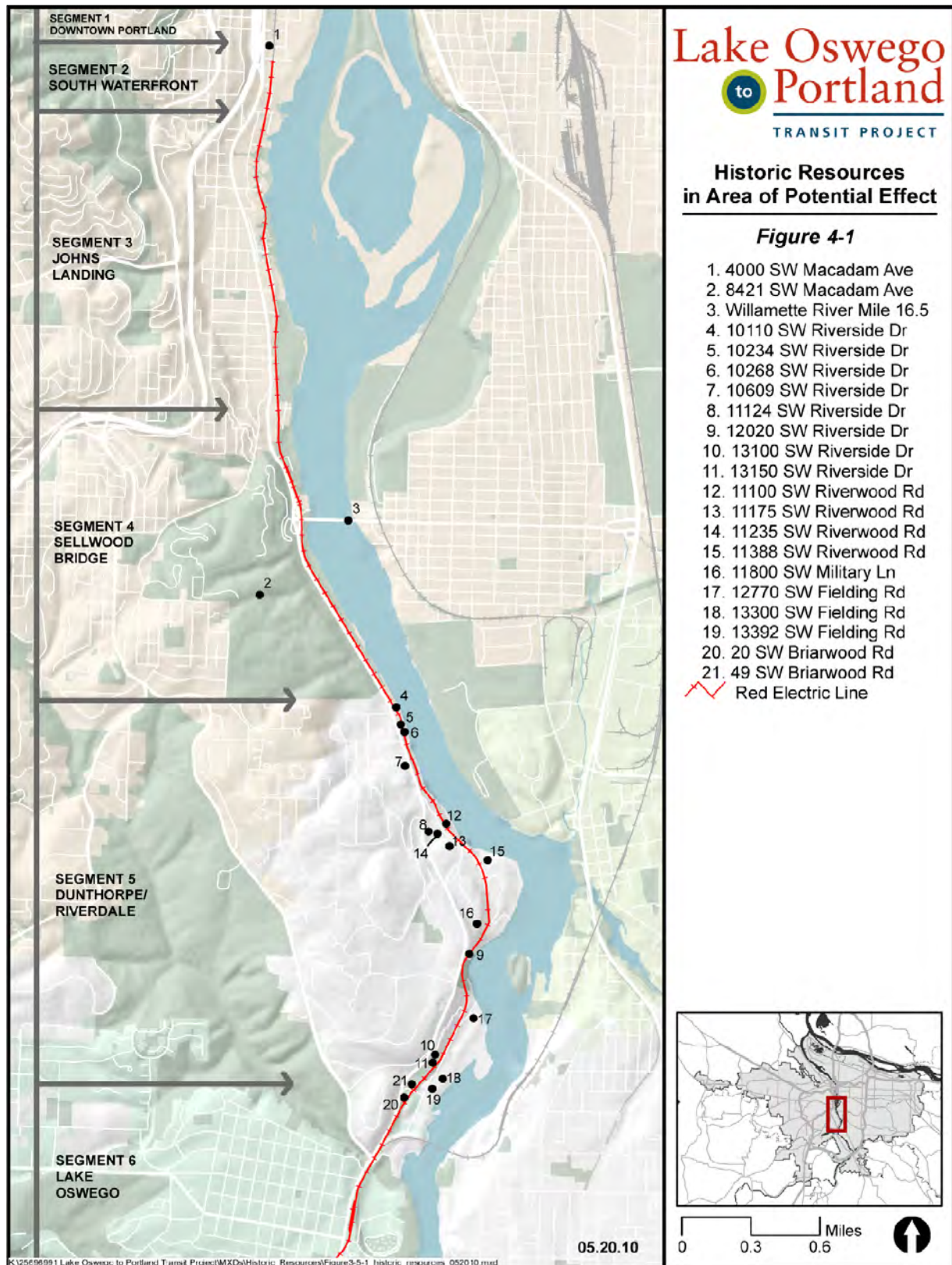


FIGURE 4-1 HISTORIC RESOURCES IN THE AREA OF POTENTIAL EFFECT

4.3 Archaeological Resources

For archaeological resources, this study was limited to a review of existing data. Records on file at the Oregon State Historic Preservation Office, as well as archival data and historic maps, were reviewed. Based on records available at the Oregon SHPO, there are no known archaeological sites within the APE, and no prior archaeological survey coverage has occurred within the APE. Six archaeological sites have been recorded within a one-mile radius of the project APE within a similar urban setting, including three prehistoric-period resources and three historic-period resources. Several pre-contact period archaeological sites are located south of, or within, the town of Lake Oswego, along the western shore of the Willamette River.

Much of the APE can be considered to have a general sensitivity for archaeological resources based on the following:

- Proximity to the Willamette River shoreline, which increases probability for pre-contact and historic period sites;
- Historic maps review, which indicates the presence of early historic settlement throughout much of the proposed corridor;
- Association with the historic rail corridor, which could have archaeological sites related to construction and operation of the original rail line;
- The known presence of pre-contact and historic archaeological sites in the broader vicinity that are found within similarly developed, urban settings;
- The literature review, which indicates potential for ethno historic use of the project area; and
- The presence of old town neighborhoods and urban centers of historic importance, such as Chinatown, the Pearl District, the Fulton and Dunthorpe neighborhoods, and Old town Lake Oswego, which indicate sensitivity for a variety of historic-period archaeological site types.

While there is the potential for archaeological resources, the extent of past impacts associated with modern urban development in the APE may have caused disturbances to, obscured, or obliterated evidence for such potential resources.

A field reconnaissance or pedestrian archaeological inventory has not been conducted for this project to date. Each of the alternatives has the general potential for as yet-undocumented archaeological sites. Because much of the proposed corridor falls within urban developed areas, a pedestrian inventory may be of limited value in terms of site reconnaissance in many areas. Appropriate and practicable methods of archaeological site reconnaissance will be considered once an alternative is selected, and could include but are not limited to, pedestrian survey, exploratory probing, and/or monitoring of construction-related ground-disturbing activities.

5. ENVIRONMENTAL CONSEQUENCES

5.1 Direct Effects

Direct effects are those effects that would occur to historic, archaeological or cultural resources as a result of ground disturbing activities or permanent construction improvements. For historic resources, direct effects would include direct changes to identified historic resources in the corridor resulting from construction of project related facilities. Relative to archaeological resources, because no known sites have been previously recorded within the APE, direct effects would include potential to affect currently unidentified archaeological resources. Direct effects on traditional cultural properties or other sensitive or sacred resources that might be of concern cannot be determined until consultation with the tribes is concluded. This consultation is not expected to be completed until after the DEIS is issued.

Detailed maps of the historic resources and the proposed alternatives are located in Appendix C.

5.1.1 No-Build Alternative

5.1.1.1 Historic Resources

Except for the Red Electric Eastside Line, there would be no direct long-term impacts to historic properties resulting from the No-Build Alternative. The No-Build Alternative would likely result in adverse effects to the Red Electric Eastside Line, because the consortium purchased and maintains the Willamette Shore Line right of way to preserve it for future passenger rail service and could decide to relinquish ownership if its membership determines that passenger rail service in the corridor is not feasible or viable. Alternately, the consortium could decide to continue ownership and maintenance of the right of way indefinitely pending changes in conditions that would lead to conversion of the line to urban rail service in the future. However, the increasing decline of the condition of the existing track, ties and trestles and escalating maintenance costs would make it difficult for the consortium to continue ownership and maintenance of the line indefinitely. If passenger rail service is not reintroduced or maintained, the consortium would consider legal transfer or sale of the right of way. If the line were to be sold by the consortium, the interval excursion trolley service could be discontinued and ownership of at least portions of the Red Electric Eastside Line could revert to adjacent property owners. Further, contributing elements of the line (e.g., track, ties, ballast, trestles) could fall into disrepair and/or could be removed. If private individuals or other groups attained ownership of portions of the line, they would not be required to comply with Section 106 requirements for those portions of the line.

5.1.1.2 Archaeological Resources and Traditional Cultural Properties

There would be no direct long-term impacts to archaeological sites with the No-Build Alternative. There is the potential for indirect effects to unidentified historic or archaeological resources due to development of other transportation projects that would still occur even if this transit project were not developed. These potential indirect effects cannot be quantified.

5.1.2 Enhanced Bus Alternative

5.1.2.1 Historic Resources

The Enhanced Bus Alternative would result in the same risk of adversely affecting the Red Electric Eastside Line as would the No-Build Alternative, described above.

The construction of transit facilities (i.e., park-and-ride lot in downtown Lake Oswego and removal of approximately half of the existing bus stops between downtown Lake Oswego and downtown Portland) would not adversely affect any historic resources in the corridor.

5.1.2.2 Archaeological Resources and Traditional Cultural Properties

The Enhanced Bus Alternative has a smaller footprint for construction-related ground-disturbance than the Streetcar Alternative, since this alternative mainly involves use of previously disturbed locations, existing roadways and bus stop facilities. Only limited capital improvements, such as construction of a park-and-ride facility in Lake Oswego that would be constructed within an existing parking lot, would occur. Because much of the proposed project would be confined to already-developed and disturbed existing right-of-way, the potential for the project to cause adverse impacts to historic resources or undiscovered, significant, archaeological sites is limited. Additional evaluation would be necessary for those areas subject to ground-disturbing construction upon selection of a preferred alternative, because the Enhanced Bus Alternative could result in construction-related impacts to currently undiscovered pre-contact and historic-period archaeological resources within the APE. Long-term effects could include the impacts of disturbances to buried archaeological sites encountered during construction and the permanent loss of the archaeological deposits from destruction or removal. However, there is also the potential for some compensatory benefits if resources are identified because they can be inventoried and recorded, and other preservation actions can be identified.

5.1.3 Streetcar Alternative

5.1.3.1 Historic Resources

A preliminary assessment of potential effects of the Streetcar Alternative on historic resources is provided below. Potential effects are described as precisely as possible, but the nature and extent of impacts are not fully known at this point because the project design has not yet been refined to a high degree of precision. Once the Locally Preferred Alternative (LPA) is selected, the project design is refined, and mitigation strategies are developed, impacts will be described and evaluated on a resource-by-resource basis and included in the project's FEIS. The preliminary finding is that there would be no historic properties adversely affected by the Streetcar Alternative.³

Table 5-1 summarizes the potential effects of the Streetcar Alternative, by segment.

³ The Riverwood In-Street Design Option would displace the house at 10808 SW Riverwood Road. This house, built in 1961, was evaluated but determined to be not eligible for the National Register of Historic Places because of its loss of historic integrity and lack of historic significance. Therefore it is not considered a historic resource.

Table 5-1 Effects of Streetcar Alternative and Design Options on Historic Resources

Segment	Design Option	Number of Historic Resources ¹	Number of Historic Resources Affected	Number of Historic Resources Adversely Affected*
1 – Downtown Portland	None	1	0	0
2 – South Waterfront ²	None	0	0	0
3 – Johns Landing	Willamette Shore Line	0	0	0
	Macadam In-Street	0	0	0
	Macadam Additional Lane	0	0	0
4 – Sellwood Bridge ²	None	1	0	0
5 – Dunthorpe/Riverdale	Willamette Shore Line	16	0	0
	Riverwood In-Street	19	0	0
6 – Lake Oswego	UPRR	1	0	0
	Foothills	1	0	0
All segments	Red Electric Line¹	1	1	TBD ³
Total (range)		22-24		0

Source: Lake Oswego to Portland Transit Project Streetcar Plan Set, November 9, 2009.

¹ The Red Electric Rail Line runs the length of the corridor through segments 2 through 6. ² The Riverwood In-Street design option would use a non-historic portion of the tax parcel associated with 10609 SW Riverside Drive, but would not use any of the historic portion of that tax parcel.

² The South Waterfront and Sellwood Bridge Segments contain potential construction phasing options associated with the Streetcar alignments. See Section 3.17 Phasing for more information regarding phasing options and differences between those options.

³ To Be Determined (TBD). Based on the project's current conceptual engineering (approximately 8 percent design), the Streetcar Alternative could result in an effect or an adverse effect on the Red Electric Eastside Rail Line.

Impacts to the Red Electric Eastside Rail Line

The Streetcar Alternative would use the Willamette Shore Line right of way, which is historically known as the Red Electric Eastside Rail Line. The Streetcar Alternative would result in the restoration of interurban electric rail service between downtown Portland and downtown Lake Oswego, a type of service that operated between 1914 and 1929. The existing railroad right of way and facilities generally between Southwest Lowell Road and downtown Lake Oswego would be restored, rehabilitated and replaced as needed to allow for the safe and efficient operations of interurban passenger electric rail service, meeting current design standards and permitting requirements. Based on the project's current conceptual engineering (approximately 8 percent

design), the Streetcar Alternative could result in an effect or an adverse effect on the Red Electric Eastside Rail Line. Future design work during the Preliminary Engineering phase would further inform the determination of effect. In order to restore regular passenger service in the right of way, the whole line would be re-electrified. Safety improvements would be added to crossings, and stations would be reintroduced at various locations along the line. Streetcar improvements would likely include the replacement and reconstruction of the existing railroad ties and rails. Elk Rock Tunnel, the one tunnel on the corridor, would be reinforced. The six rail trestles on the corridor will be analyzed for potential rehabilitation, restoration, or reconstruction. If the Streetcar Alternative is selected as the Locally Preferred Alternative, all future design work contributing the restoration of the interurban electric rail service would be completed in compliance with applicable elements of the Federal Section 106 regulations and guidelines, such as 36 CFR Part 800 (Protection of Historic Properties) and 36 CFR Part 68 (Secretary's Standards for the Treatment of Historic Properties).

TriMet, Metro and the City of Portland would conduct further design work during the project's Preliminary Engineering phase, prior to publication of the project's FEIS and final Section 106 and Section 4(f) report. That design work would be conducted in consultation with FTA and the Oregon SHPO with the intent to avoid any adverse effect on the Red Electric Eastside Rail Line, while providing for the safe and efficient operations of urban electric rail service, meeting current design standards and permitting requirements. If the design effort for the Streetcar Alternative were to result in an adverse effect on the Red Electric Eastside Rail Line, the project would need to demonstrate, consistent with Section 4(f) requirements), that there is no prudent or feasible alternative to that adverse effect and that all possible planning to minimize harm was done. That determination would be made, if warranted, prior to publication of the FEIS and final Section 106 and Section 4(f) report.

Effects to the Red Electric Eastside Rail Line would vary by design option. Option-specific effects are described in the following section. Some segments of the corridor include streetcar design options that would not use portions of the Red Electric Eastside Rail Line. In Segment 6, the current Willamette Shore Line right of way is not in the same location as the historic Red Electric Eastside Rail Line. For the most part, the project would extend the streetcar from its current locations at SW Lowell Street in South Waterfront with the necessary improvements to provide for safe and efficient passage between Lake Oswego and Portland. With the corridor there are design and phasing options that would not use the Red Electric Rail Line. A more detailed description of the streetcar design options follows.

Rail and Tie Replacement

According to the previously completed Determination of Eligibility for the Southern Pacific Railroad Red Electric Eastside Line, the rail line retains a high degree of original integrity. When early railroad maintenance crews replaced railroad ties, they added dated nails to provide a record of when those ties were replaced. Photos 1 and 2 show a tie that was replaced in 1928; many other ties also carry similar nail heads from different years.



PHOTO 5-1: RAILROAD TIE WITH DATED NAIL HEAD



PHOTO 5-2: DETAIL OF NAIL HEAD FROM 1928

The existing ties and tracks have deteriorated; in some places, originally straight sections of track are now curved because the land has shifted. In addition, the Willamette Shoreline Consortium has routinely replaced the tracks, including ties and trestles, in order to safely continue the current trolley service. Because of the condition of the tracks, and also because most sections of the route are proposed to be double track for efficient operations, the existing tracks and ties would be removed and replaced with new ties and tracks.

Although replacement of rails and ties is a common and constant occurrence with any active rail line, the replacement of all rails and all ties is a major action, particularly where some ties are documented to date from the period of significance. In order to avoid adversely impacting the rail line, a representative sample of the nail heads could be documented and some dated nails saved as examples.

Trestles

Five trestles would be impacted by the Streetcar Alternative: the Jones Trestle (milepost 772.61) in the vicinity of the River Pointe Condominiums; the Staff Jennings Trestle (milepost 771.40) north of the Sellwood Bridge; the short trestle (milepost 770.22) in the Dunthorpe neighborhood, the long trestle (milepost 770.03); and the Briarwood Road Trestle (milepost 768.60).

Substantial portions of the Jones Trestle have been filled in (with dirt) and much of the land around the trestle has been re-graded. Many stringers, pilings, and ties have been replaced over the years as well. As a result, it has lost most of its historic significance, not to mention structural integrity. Because the trestle is deteriorating and settling, the Streetcar Alternative would involve demolishing the trestle and building the new rails on re-graded ground.

The Staff Jennings Trestle, by contrast, is in fair to good condition, although the trestle beams have been replaced over the years by the Willamette Shoreline Consortium. It is located just north of the

Sellwood Bridge and crosses over Sellwood Ferry Road that provides access to the Willamette River and to Staff Jennings, a nearby business. The project assumes that the Sellwood Bridge and the new west interchange would be constructed prior to the streetcar alternative. If that were the case, the bridge replacement project would demolish the trestle (the Sellwood Bridge Replacement Project's environmental documentation includes an evaluation of impacts to the railroad).

If the Sellwood Bridge replacement project and new west interchange were not constructed prior to or concurrently with the streetcar alternative, the project would construct the streetcar alignment in the existing Willamette Shore Line right of way in the interim. With this scenario, the trestle would be demolished and replaced in order to accommodate double tracking.

The Determination of Eligibility cites the "Riverwood Trestle" (the long and short trestles located just north of the northern end of Riverwood Road) as being an important contributing element to the rail line. These two trestles are separated by only a short gap. They have been repaired and maintained over the years, but they still retain their historic integrity and remain important contributing elements to the rail line. Neither one is in good enough condition to safely support a streetcar. Furthermore, the design for the Streetcar Alternative calls for a double track through this area for better operations. There are two design options in the vicinity of the long and short trestles.

The Willamette Shore Line design option for the Streetcar Alternative would require the demolition and reconstruction of both trestles. The replacement trestles would be located in the same place, but would be wider to accommodate double track. The replacement trestles have not been designed yet, so there are no details available regarding their appearance.

The Riverwood In-Street design option would move the tracks to the west in the vicinity of the long and short trestle. A set of double tracks would be built on a new trestle that would be higher than the existing trestles; they would be aligned to meet the northern end of SW Riverwood Road and then would be located on SW Riverwood Road (the streetcar would operate in mixed traffic along Riverwood Road). The design for the new trestles has not been developed, nor has a decision been made about what would happen to the existing trestles.

The Briarwood Road Trestle is a short trestle over Briarwood Road. It is in good condition although the trestle beams have been replaced over the years by the Willamette Shoreline Consortium. It would be widened to accommodate a double track.

If the Streetcar Alternative were selected as the LPA, the project may be required to document the trestles before demolition as a mitigation strategy. This documentation could include measured drawings, large-format photographs, and a written history of the trestles that is more detailed than the existing Determination of Eligibility.



PHOTO 5-3: LONG TRESTLE. LOOKING NORTH

Tunnel

The Elk Rock Tunnel was built in 1921 in an early attempt to enhance safety. Originally, a long trestle was located at the base of the cliffs on the west shore of the Willamette River. The rocks composing those cliffs were (and still are) unstable, so a watchman lived in a house at the south end of the trestle and frequently checked the trestles for fallen rocks and damage. Falling rocks also posed a threat to the trains themselves, so the tunnel was a major improvement as it dramatically increased safety for the Red Electrics. The tunnel openings are poured concrete, but the interior of the tunnel is sprayed concrete. The sprayed concrete was applied after a 1967 fire burned the log structure that originally lined the tunnel.

The Streetcar Alternative would add more concrete lining to the interior of the tunnel, along with lights and electricity lines, but would not otherwise impact the tunnel. The tunnel openings – currently the only parts of the tunnel that are readily visible – would remain intact. The minor alterations to the tunnel would not adversely impact the tunnel.

Stations

Originally, there were 13 stations between Portland and Lake Oswego. Station design varied considerably: the Oswego Station near the intersection of A Avenue and State Street in Lake Oswego had a station building with a waiting area and ticket sales (this station no longer exists). The Riverwood Station, adjacent to 11445 SW Riverwood Road, consisted of little more than stone steps leading from the street up to the tracks (See Figure 5-4). In other places like the Fulton Station near the intersection of SW Miles Street and SW Macadam Avenue, a small shelter was provided for waiting passengers (no shelters are known to exist in the project area).



PHOTO 5-4: STONE STEPS AT RIVERWOOD STATION

The only known remnants of an original station are the stone steps at the Riverwood Station.

The Streetcar Alternative might add a low wall topped with fencing along the railroad right-of-way in order to improve safety – the historic practice of hailing a passing train at the side of the tracks no longer meets current safety regulations. The design of the station will be determined at a later date and could incorporate historic elements into its design. The Streetcar Alternative would include the addition of new stations along the route. These stations would be of similar design to existing streetcar stations in downtown Portland. In general, they would consist of a waiting platform, shelter, benches, signs, and lighting. Specific station designs have not been developed yet. At least one proposed station – the station on the south side of Briarwood Road, -- would be located in the same place as a historic station (there are no above-ground remains of the historic station).

Crossings

A variety of crossing gates and signals now exist at roadway crossings, including wig-wag crossing signals at Riverwood Road and at Nebraska Street (See figure 5-5). These gates and signals do not meet current safety standards, therefore, the Streetcar Alternative would require additional safety measures at crossings.

The design and placement of crossing treatments has not yet been developed, nor have plans been developed for the existing crossing gates and signals. The design, placement, and appearance of the new crossing treatments could be developed to avoid adverse impacts to the rail line. The existing crossing gates and signals could be left in place with the new crossing treatments designed around them. If this is not possible, they may need to be documented before being moved in order to avoid adverse impacts.



PHOTO 5-5: WIG-WAG CROSSING SIGNAL AT SW RIVERWOOD ROAD

Electrification

Between 1914 and 1929, the rail line was electrified. The electricity was supplied on overhead catenary wires located 22 feet above the rails – slightly higher than usual in order to accommodate the freight trains that also used the tracks – and the wires were supported from wooden poles spaced approximately 150 feet apart. The proposed project would re-electrify the line with similar, albeit modern, overhead catenary wires. The re-electrification of the rail line is consistent with its period of significance and would not adversely impact the rail line.

Impacts to Historic Resources

Segment 1 – Downtown Portland (Northwest Portland to SW Lowell Street)

One historic resource, a warehouse at 4000 SW Macadam Avenue, is located in the APE of Segment 1. The preliminary finding is that there would be no historic properties adversely affected in this segment.⁴ Streetcar tracks would be installed on Moody Avenue on the east side of the building. Alteration of the street beside the building would not be significant enough to constitute an adverse effect on the building itself.

Segment 2 – South Waterfront (SW Lowell Street to SW Hamilton Court)

Aside from the Red Electric Line, there are no historic properties in Segment 2; therefore the preliminary finding is that there would be no historic properties affected in this segment.

The streetcar could be built in the interim on the Red Electric line. In the future the streetcar would be integrated into the Moody and Bond avenues street network expansion as part of the South Portal

⁴ Potential impacts to the Red Electric Eastside Rail Line are described in the “Impacts to the Red Electric Eastside Line” section above and are not included in the segment-by-segment analysis.

project. The future street network would use the Red Electric right of way and private property to extend the street network to the south, as planned to accommodate the existing and planned growth in the South Waterfront.

Segment 3 – Johns Landing (SW Hamilton Court to SW Miles Street)

Aside from the Red Electric Line, there are no historic properties in this segment; therefore the preliminary finding is that there would be no historic properties adversely affected by any of the three design options in this segment.

The design options would include use of the Red Electric Rail Line for future streetcar use or move the streetcar operations on to local private/public streets for a short distance. If the streetcar were to not use the Red Electric Rail Line in this section, there is a strong desire to construct a multi-use trail in this area

Segment 4 – Sellwood Bridge (Miles Street to south end of Powers Marine Park)

In addition to the Red Electric Rail Line, there are two historic resources in Segment 4. The preliminary finding is that there would be no historic properties adversely affected by the project related improvement with any of the design options in this segment. The two historic resources are Riverview Cemetery, located at 8421 SW Macadam Avenue, which is on the west side of Macadam Avenue in the vicinity of the Sellwood bridge, and the Sellwood Bridge.

The existing Red Electric Rail Line would be displaced and moved as part of the Sellwood Bridge project. The Sellwood Bridge project has been designed to accommodate future potential streetcar tracks and concluded through the Sellwood Bridge Final Environmental Impact Statement that there would be no adverse effect on the Red Electric Rail Line.

Segment 5 – Dunthorpe/Riverdale (south end of Powers Marine Park to SW Briarwood Road)

In addition to the Red Electric Rail Line, there are nineteen (19) historic resources in Segment 5, all of which are single-family houses except for 11800 SW Military Lane, a former residence that now houses the Episcopal Diocese of Oregon. Table 5-2 lists those houses and the types of potential impacts that would occur with each of the design options. The preliminary finding is that there would be no historic properties adversely affected by the streetcar alternative.

Table 5-2 Historic Resources in Segment 5

Address	Construction Date	Willamette Shore Line ¹	Riverwood In-Street ¹
10110 SW Riverside Dr	1952	Adjacent to back yard, potential new crossing treatments in railroad right of way	Adjacent to back yard, potential new crossing treatments in railroad right of way
10234 SW Riverside Dr	1941	Adjacent to back yard, potential new crossing treatments in railroad right of way	Adjacent to back yard, potential new crossing treatments in railroad right of way
10268 SW Riverside Dr	1941	New crossing treatments in railroad right of way	New crossing treatments in railroad right of way
10609 SW Riverside Dr	1897	Adjacent to yard	Would use a portion of the tax parcel outside the boundary of the historic resource
11124 SW Riverside Dr	1926	na	In street in front of house
12020 SW Riverside Dr	1947	Underneath (in tunnel)	Underneath (in tunnel)
13100 SW Riverside Dr	1920	Adjacent to back yard	Adjacent to back yard
13150 SW Riverside Dr	1924	Adjacent to back yard	Adjacent to back yard
11100 SW Riverwood Rd	1957	New crossing treatments in railroad right of way	New crossing treatments in railroad right of way
11175 SW Riverwood Rd	1895	na	In street in front of house
11235 SW Riverwood Rd	1927	na	In street in front of house
11388 SW Riverwood Rd	1911	On other side of street	On other side of street
11800 SW Military Ln	1917	Underneath (in tunnel)	Underneath (in tunnel)
12770 SW Fielding Rd	1911	On other side of street	On other side of street
13300 SW Fielding Rd	1942	On other side of street	On other side of street
13392 SW Fielding Rd	1938	On other side of street	On other side of street
49 Briarwood Rd	1910	Adjacent to back yard	Adjacent to back yard

¹ Summary impacts listed in the table are described more fully in the body text, below.

Willamette Shore Line Design Option

In addition to the Red Electric Rail line, there are sixteen (16) historic resources adjacent to the proposed Willamette Shore Line design option as listed in Table 5-2, above. This design option would use the existing rail alignment, adding double track where possible and adding some stations. Many of the historic resources are homes located close to the railroad; the rail corridor either bisects tax lots or is adjacent to properties on Riverside Drive and Riverwood Road. The rail corridor is located on a berm adjacent to Fielding Road, and is located beside properties on Briarwood Road. All of the historic houses were built after the rail line. Those that were built prior to 1929 existed when the Southern Pacific Red Electric line was used for frequent passenger service. Those that were built after 1929 existed when the rail lines were in use for freight service. In general, reintroducing a streetcar on the rail alignment would not constitute an adverse effect. The summary impacts listed in the table above are described below.

Adjacent to back yard, potential new crossing treatments in railroad right of way. The existing rail alignment and right of way currently divides the property; the house is located on the east side of SW Riverside Drive between the road and the railroad tracks. The proposed project would rebuild

the tracks for use with a streetcar. In order to meet current safety standards, new crossing treatments may need to be installed within the railroad right-of-way. These crossing treatments have not been designed, nor has it been determined whether they would be necessary in these two locations. However, it is likely that if the safety features are necessary, they could be designed in a way that would not adversely affect either of the two houses. Although the two houses were built after passenger service along the rail lines ceased, they were built when the railroad was still in active use for freight service. Rebuilding the tracks and running a streetcar on them would not constitute an adverse effect.

New crossing treatments in railroad right of way. There are two houses that are located on the east side of the railroad, meaning that residents and their visitors would need to cross the tracks to get to the house. Both of those houses have detached garages on the west side of the tracks, but the driveways extend across the tracks for access to parking near the house. In order to meet current safety standards, the motor vehicle and pedestrian crossings would need to be improved with some sort of gate or warning system. Although the crossing treatments will be needed, they have not been designed yet. It is likely that they could be designed in a way that would not adversely affect either of the two houses. Although the two houses were built after passenger service along the rail lines ceased, they were built when the railroad was still in active use for freight service. Rebuilding the tracks and running a streetcar on them would not constitute an adverse effect.

Adjacent to yard. The one house whose yard is divided by both SW Riverside Drive and the railroad (10609 SW Riverside Drive) is located on the west side of SW Riverside Drive. The historic resource is limited to the portion of the tax lot on which the house is located, on the west side of SW Riverside Drive. The portions of its tax lot that extend east to the shore of the Willamette River are located on a very steep slope and are so divorced from the house that they are not considered part of the historic resource. Rebuilding the tracks and trestles located near this property and running a streetcar on them would not constitute an adverse effect.

Underneath (in tunnel). The tunnel is located on an easement underneath two historic properties. Changes to the tracks and tunnel, and the use of the tracks for a streetcar may not even be apparent to the residents and visitors to these two properties.

Adjacent to back yard. There are two houses where the railroad right-of-way runs adjacent to the back yard. Both houses were built when the rail line was used for frequent passenger service, so reintroducing modern streetcar service, albeit one that meets current safety standards, would not constitute an adverse effect.

On other side of street. In places where this is listed as the potential impact, the railroad tracks are located adjacent to the street. The tracks are located on the other side of the street from the houses. Although the streetcar may be visible to the houses, the changes associated with rebuilding the tracks and using them for a streetcar would not be sufficient to constitute an adverse effect.

The streetcar would use the Red Electric Rail Line for the entire length of this segment with the Willamette Shore Line design option.

Riverwood Design Option

In addition to the Red Electric Rail Line, there are nineteen (19) historic properties in the APE for this design option, all of which are single-family houses except for the property used by the

Episcopalian Diocese as described above. The preliminary finding is that there would be no historic properties adversely affected by the re-introduction of the streetcar on the existing rail corridor.⁵

The potential impacts are the same as those described in the Willamette Shore Line Design Option, above, except for the following two impacts:

Would use a portion of the tax parcel outside the boundary of the historic resource. This design option would require the use of a non-historic portion of the tax parcel associated with the house at 10609 SW Riverside Drive. As noted in the description for the Willamette Shore Line Design Option above, the historic resource is limited to the portion of the tax lot on which the house is located, on the west side of SW Riverside Drive. The portions of its tax lot that extend east to the shore of the Willamette River are located on a very steep slope and are so divorced from the house that they are not considered part of the historic resource. The Riverwood In-Street Design Option would require the use of a non-historic portion of the tax lot, but would not use any of the historic resource. The streetcar would not be visible from the house or other places within the historic resource, so there would not be any adverse effect.

In street in front of house. This design option would realign the streetcar tracks and use Riverwood Road for a portion of the length of the street. The streetcar would operate in mixed traffic as it currently operates in downtown Portland. In the block where the new streetcar line would be added, the existing pavement is relatively narrow and there are wide unpaved shoulders on both sides. The rock walls that line many front yards along Riverwood Road are all located back far enough that they would not be displaced by this design option. No new right-of-way would need to be acquired. Although the addition of a streetcar on Riverwood Road would be a change from the current conditions, it would not be significant enough to constitute an adverse effect.

The streetcar would be relocated to SW Riverwood Road for a portion of the alignment with the Riverwood Road design option. If the streetcar were to operate in SW Riverwood Road, the Red Electric Rail Line could be sold or abandoned.

Segment 6 – Lake Oswego (SW Briarwood Road to Lake Oswego Terminus)

In addition to the Red Electric Rail Line, there is one (1) historic resource in Segment 6, the house at 20 SW Briarwood Road. This house was built during the period when the railroad was in use as the Red Electric line. The preliminary finding is that there would be no historic properties adversely affected by either of the design options in this segment.

Both of the design options in this segment would be located east of the existing tracks and terminate at Albertsons. The current location of the Willamette Shore Line right of way in this segment is not the historic location. The original alignment was modified as the district developed.

Impacts to Archaeological Resources

Effects of the Streetcar Alternative to archaeological resources could result from construction-related impacts where yet to be discovered resources exist. The Streetcar Alternative would require

⁵ The Riverwood design option would displace the house at 10808 SW Riverwood Road. This house, built in 1961, was evaluated but determined to be not eligible for the National Register of Historic Places because of its loss of historic integrity and lack of historic significance. Therefore it is not considered a historic resource.

construction of approximately six miles of new street car tracks, 10 new stations, and two new park-and-ride facilities. However, most of the proposed project would be confined to the already-developed and disturbed existing right-of-way. The potential for the project to cause adverse impacts to undiscovered, significant, archaeological sites is probably limited but would need to be considered in more detail for those areas subject to ground-disturbing construction upon selection of a preferred alternative. Effects of the Streetcar Alternative to archaeology resources could result from construction-related impacts to areas with the general potential for pre-contact and historic-period archaeological resources within the APE. The locations of archaeological resources may not be determined prior to selection of the preferred alternative. After selection of a preferred alternative, the project would conduct additional investigations, possibly including subsurface explorations in undeveloped areas and other methods in paved areas as appropriate, to help further define the potential presence of resources. Still, some resources could be undetected and may not be avoided prior to construction. Long-term effects could include the impacts of disturbances to buried archaeological sites encountered during construction and the permanent loss of the archaeological deposits from destruction or removal. However, there is also the potential for some compensatory benefits if resources are identified because they can be inventoried and recorded, and other preservation actions can be identified.

5.2 Indirect and Cumulative Effects

Indirect and cumulative effects to historic and/or traditional cultural properties or other sensitive or sacred resources that might be of concern cannot be fully determined until consultation with the tribes is concluded. This consultation has been initiated and is ongoing as the DEIS is issued.

Relative to indirect and cumulative effects, it is assumed that there will be slow to moderate new development and some redevelopment in the Portland Central City, in the South Waterfront area, in the Johns Landing/North Macadam area, and in the Lake Oswego Town Center. In the Lake Oswego Town Center area, the foothills area is likely to progress with a new street plan and some new development. The Sellwood Bridge Replacement Project, in which the historic Sellwood Bridge would be replaced with a new bridge, would result in the loss of the Sellwood Bridge itself and potentially other historic resources (impacts associated with that project are disclosed in that project's NEPA documentation).

5.2.1 No-Build Alternative

5.2.1.1 Historic Resources

Selection of the No-Build Alternative would not result in any direct impacts, and therefore it would not increase indirect or cumulative impacts to most of the historic resources. Indirect and cumulative effects would include the further development of the area, increasing densities and pressure for changes to historic resources.

With the No-Build Alternative, the Red Electric rail line would not be converted to active streetcar use. Excursion trains and maintenance vehicles might continue to run on the line. Routine maintenance work, including repair and replacement of trestle supports and track and tie repair or replacement would continue for some time. However, selection of the No-Build Alternative could result in increased pressure to discontinue even the recreational use of the railroad and to vacate the rail corridor altogether, resulting the deterioration and potential loss of the resource.

5.2.1.2 Archaeological Resources and Traditional Cultural Properties

Selection of the No-Build Alternative would not result in any direct impacts, and therefore it would not increase indirect or cumulative impacts to archaeological or traditional cultural resources. Indirect and cumulative effects would include the further development of the area, which would require ground disturbance.

However, with the No-Build Alternative, there also would be less potential for discovery, identification and documentation of archeological resources. While archaeological sites are protected by state and federal law, currently unidentified sites could be inadvertently disturbed by privately-funded development actions and may not be subject to the level of protection provided by a federally-funded project. Archaeological sites could also be adversely affected by the actions of others; effects could range from modification, to loss of association, to demolition.

5.2.2 Enhanced Bus Alternative

The Enhanced Bus Alternative would improve transit service within the project vicinity, potentially increasing development and redevelopment pressure that would risk changes to historic resources. Other projects would still be developed in areas that may contain pre-contact or historic-period archaeological sites, with or without the transit project. Cumulative impacts would derive from changes to historic resources that would decrease their historic integrity and the increased loss to the archaeological record of significant archaeological resources caused by new construction.

5.2.3 Streetcar Alternative

The potential indirect and cumulative effects of the Streetcar Alternative would be similar to those associated with the Enhanced Bus Alternative. The Portland streetcar system has helped to increase densities and hasten development or redevelopment according to existing land use zoning (within its immediate vicinity i.e. within a few blocks of the line), so it is possible that the pressure for development or redevelopment would be greater than with the Enhanced Bus Alternative. Most of the historic resources are located along SW Riverside Drive, in the Riverwood neighborhood, and the Briarwood neighborhood, and all of these areas have limited development or redevelopment potential. Therefore, the type and scale of development or redevelopment seen elsewhere as a result of a new streetcar is not possible within many areas of the proposed alignment, thus lessening the potential for indirect and cumulative impacts to historic resources.

For archaeological and cultural resources, because the construction footprint for ground-disturbance at the Streetcar Alternative is expected to be greater, there would be greater potential for indirect and cumulative effects to occur with selection of the Streetcar Alternative.

6. POTENTIAL MITIGATION MEASURES

6.1 Mitigation for Impacts to Historic Resources

Mitigation measures would be necessary to avoid adverse impacts to historic resources with the Streetcar Alternative. Following are potential mitigation measures. The potential mitigation measures are preliminary; the SHPO may require additional or different measures as the project plans develop. Ongoing coordination will be necessary to ensure that the project results in no historic properties adversely affected.

- The Streetcar Alternative would replace the rails, railroad ties, and most trestles associated with the Red Electric Eastside Line. These resources could be documented and, in the case of the dated nails embedded in the railroad ties, retrieved and preserved. Documentation could include measured drawings, large-format photographs, and a detailed written narrative.
- If possible, the project design and construction plans should be designed to preserve the Riverwood Station steps located just north of 11445 SW Riverwood Road. If preservation is not possible, the steps should be documented before being demolished.
- The design, placement, and appearance of the new crossing treatments should be developed to avoid adverse impacts to the rail line. The best scenario would be to incorporate the existing crossing gates and signals into the new crossing designs. If this is not possible, they may need to be documented before being removed in order to avoid adverse impacts.

6.2 Mitigation for Impacts to Archaeological Resources and Traditional Cultural Properties

Unidentified archaeological resources could be affected by construction of the Enhanced Bus and Streetcar Alternatives. Unlike historic buildings, archaeological resources are concealed beneath sidewalks, buildings, parking lots and streets. The probability of encountering archaeological resources is based upon presence of sensitive landforms or previous discoveries in the project vicinity; however, it is usually not possible to locate archaeological resources prior to construction when they are hidden under sidewalks and streets. Because archaeological resources in urban settings are often identified only during construction of the preferred alternative, avoidance through redesign is usually not practicable until the preferred alternative has been selected and the Record of Decision finalized. The potential types of archaeological resources differ, but the treatment for potential mitigation would be similar.

Subsurface testing, shovel probing, and exploratory excavations for buried archaeological sites during preliminary engineering, final design, and in early construction could reduce potential impacts and minimize delays during general construction. Prior to such investigation, an inadvertent discovery plan would need to be prepared and approved by SHPO. This plan would establish procedures to deal with unanticipated discovery of cultural resources before and during construction. The plan would require immediate work stoppage and appropriate notification in the event of discovery of previously unknown cultural materials. The plan would also specify protocols for the treatment of human remains that fulfill the requirements of the Native American Graves Protection and Repatriation Act in the event that human remains and/or funerary items are encountered during construction or operation of the project. Monitoring protocol would be addressed in consultation with the federal agencies, the SHPO, Metro, TriMet, and appropriate interested Tribes.

ACHP has issued guidance for the recovery of information from archaeological sites (ACHP, 1999 and 2008). Mitigation measures could include, but are not limited to, avoidance or preservation in place, recovery of archaeological data, public interpretive display, or other options. Data recovery as mitigation for adverse effects is acceptable only when specific conditions are met and a data recovery plan has been prepared. Mitigation of adverse effects to archaeological resources will need to be defined in consultation with SHPO and other designated consulting parties.

For resources identified during construction that cannot be avoided, mitigation would focus on documentation, data recovery and analysis, as determined through consultation with the SHPO and interested Tribes. The final analysis of impacts would be documented in the Portland to Lake Oswego Transit Project FEIS. If there are significant effects from the selected alternative that could not be avoided, an MOA would be developed through consultation among the agencies, FTA, SHPO, interested Tribes (if applicable), and other affected parties. The MOA would document mitigation commitments. The MOA would be completed prior to publication of and be included within the FEIS

After selection of a preferred alternative, the project would conduct more focused additional archaeological investigations, possibly including subsurface explorations in undeveloped areas and other methods in paved areas as appropriate, to help further define the potential presence of resources. Still, some resources could be undetected and may not be avoided prior to construction.

6.3 Next Steps and Completion of the Section 106 Process

Ongoing coordination with Oregon SHPO and federally recognized tribes, as retained by tribal treaty rights, will be necessary to ensure that there no historic properties or archaeological resources would be adversely affected by the proposed project improvements.

During the DEIS phase of the project, Determinations of Eligibility have been submitted to Oregon SHPO along with preliminary Level of Effect assessments and identification of potential mitigation measures. In the DEIS phase, it is expected that Oregon SHPO consultation and concurrence with the Determinations of Eligibility will be completed.

The preliminary Level of Effect evaluations that have been documented in this DEIS and potential mitigation measures will serve as the initial recommendations for incorporating into future design refinements. The assessment is expected to be refined through the selection of the Locally Preferred Alternative and project related design refinements in the Preliminary Engineering/FEIS phase. Oregon SHPO may recommend additional or different mitigation measures. Further coordination with SHPO and the results of the consultation would be incorporated into the project design, and documented in the FEIS and the ROD. The project's goal would be to refine the design to the extent that there are no historic properties adversely affected. If necessary a Memorandum of Agreement between Oregon SHPO, FTA, TriMet and federally recognized tribes, if they so choose, would be prepared to document mitigation strategies that are mutually agreed upon and design refinements that are necessary.

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