City of Portland
Bureau of
Planning and Sustainability
Sam Adams, Mayor
Susan Anderson, Director

1900 S.W. 4th Ave., Ste. 7100
Portland, OR 97201-5350
Phone 503-823-7700
FAX 503-823-7800
TTY 503-823-6868

www.portlandonline.com/bps

INTEROFFICE MEMORANDUM

TO: PLANNING AND SUSTAINABILITY COMMISSION
FROM: DON HASON AND CHRIS SMITH
SUBJECT: LAKE OSWEGO TO PORTLAND TRANSIT PROJECT
DATE: 12/9/2010

At your request we have reviewed the Draft Environmental Impact Statement (DEIS) with an eye towards issues on which we might productively advise Mayor Adams as he participates in the project Steering Committee process to determine a recommendation on the Locally Preferred Alternative (LPA), which include mode and alignment choices.

Having reviewed the DEIS, we would like to commend the following issues to your attention as possible items on which to advise Mayor Adams:

1) Mode choice between Enhanced Bus and Streetcar. The Streetcar alternative is clearly more in alignment with achieving zoned densities in the John's Landing neighborhood. However, the Streetcar alternative has considerably higher capital costs than the Enhanced Bus option. But it should also be considered that the Streetcar is less expensive to operate annually than Enhanced Bus.

2) Streetcar alignment in the Johns Landing segment. There are three options within this segment:

- On the existing Willamette Shoreline right-of-way
- In-lane on Macadam within the existing lanes
- In-lane on Macadam with a new dedicated lane in the Northbound direction

The Macadam option most strongly supports zoned densities along Macadam. The in-lane option would appear to maximize opportunities to retain landscaping and optimize the pedestrian environment.

3) Streetcar alignment in the Dunthorpe/Riverdale area. Through intergovernmental agreement with the County, our legislative responsibility extends into this portion of the corridor in unincorporated Multnomah County. There are two alignment options in this area, using the existing Willamette Shoreline right-of-way or using Riverwood Rd. The existing right-of-way is problematic in some areas, passing near homes, sometimes between a home and the road. The Riverwood option avoids many of these conflicts, but at the expense of modifying or eliminating direct access to Riverwood Rd. from Highway 43 (access via Military Rd. would remain).

Staff will brief us on these issues on December 14th. You will also find attached excerpted pages from the DEIS specific to these issues.

Table S-2 Summary of Environmental Effects by Alternative (average weekday, 2035)

Measure	No-Build	Enhanced Bus	Streetcar
Households/Jobs within New Fixed-Guideway Station Areas	0 / 0	0 / 0	12,080 / 24,920
P.M. In-Vehicle Transit Travel Time Lake Oswego to PSU	42	39	33 or 29
Corridor Transit Place Miles[1]	190,600	222,220	242,000 or 244,760
Miles of New Exclusive Transit Right of Way	0	0	3.9 to 5.4
Annual Systemwide Transit Ridership (compared to No-Build)	N/A	730,550	1.18 to 1.28 million
Regional Vehicle Hours of Delay	49,400	49,200	49,000
New Congested Intersections(compared to No-Build)	N/A	3	2 or 4
Net Parking Spaces Removed	0	0	0 to 175
General Consistency with RTP and Local Plans	Inconsistent	Inconsistent	Consistent
Construction Jobs Created	0	240	1,430 to 1,530
Long-Term Jobs Created (from No-Build)	N/A	28	13
Available Floor Area in New Station Areas (millions of square feet)	0	0	42.825 or 44.492
Potential Displacements	0	0	0 to 7
Severe Noise Impacts (without / with potential mitigation)	0 / 0	0 / 0	1 / 0
Vibration Impacts (without / with potential mitigation)	0 / 0	0 / 0	23 to 28 / 0
Tons of CO_2 Released by Vehicles (regional from No-Build)	N/A	-25.40	-40.51 or -42.12
Historic Resources Adversely Affected	1	1	0 or 1
Acres of Parkland Used	0	0	0.7 or 1.0
Acres of Wetland Filled	0	0	0.10 to 0.11
Acres of Fill in Floodplain	0	1.3	6.5 to 10.1
Acres of New Impervious Surfaces	0	0.8	7.35 to 18.22

Source: Metro, TriMet: January 2010. Note: PSU = Portland State University; N/A = not applicable. Ranges for the Streetcar would result from different design options – see the DEIS and following four tables for additional detail.

[1] Place-miles refers to the total carrying capacity (seated and standing) of each bus or train type and is calculated by multiplying the vehicle capacity of each bus or light rail vehicle type by the daily VMT for each vehicle type.

A. Enhanced Bus Alternative Compared to the No-Build Alternative

The **Enhanced Bus Alternative** would result in:

- 1,800 more daily transit trips in the corridor;
- 730,550 annual systemwide transit person trips;
- A reduction of three minutes in in-vehicle transit travel time from Portland State University to downtown Lake Oswego during the peak period;
- 240 additional short-term construction jobs and 28 additional long-term jobs;
- 31,620 additional transit place miles;
- 41,000 fewer vehicle miles traveled, 3,300 fewer vehicle hours traveled and 200 fewer vehicle hours of delay;
- An increase of 0.1 corridor transit miles per hour; and
- A reduction of 25.40 tons of CO_2 released by vehicles.

In comparison, the **No-Build Alternative** would avoid:

- $37.8 million in capital costs (2010 dollars);
- $2.79 million additional annual operating costs (2010 dollars in 2035);
- Three additional congested intersections; and
- 1.3 acres of fill in the 100-year floodplain and 0.8 acres of new impervious surface.

A. Segment 3 – Johns Landing. In segment 3, there are three design options considered for the Streetcar Alternative: the Willamette Shore Line, Macadam In-Street and Macadam Additional Lane. The Table S-3 lists several of the ways in which the alternatives would affect the built, natural and social environment for the streetcar design options in segment 3.

The **Willamette Shore Line design option** would result in:

- 420 additional transit riders on Highway 43, Southwest Corbett Avenue and the Willamette Shore Line in the peak period and peak direction;
- 97,250 more annual transit person trips;
- An additional four minutes of transit in-vehicle travel time savings from Portland State University and Southwest Lowell Street to Lake Oswego during the peak period;
- An additional 0.8 miles of exclusive transit right of way and an additional 7,100 passenger miles in exclusive transit right -of way;
- The avoidance of up to $13.68 million in capital costs;
- $8.9 million more local match available from the use of the existing Willamette Shore Line right of way;
- Avoiding the potential removal of 148 on-street and 175 off-street parking spaces;
- The reduction of 1.61 tons of CO_2 emitted by vehicles;
- No displacements; and
- Approximately 5.5 to 6.5 fewer acres of new impervious surface.

The **Macadam In-Street design option**[1] would result in:

- Greater visibility within the Johns Landing activity center, thus providing better support to the desired land use and economic development objectives for the activity centers;
- 1.67 million more square feet of Available Floor Area within new station areas;
- 2,760 more transit place miles;
- Avoidance of one vibration impact (all vibration impacts in this segment would be eliminated with identified potential mitigation measures);
- Approximately 5.5 more acres of new impervious surface[2];
- No displacements; and
- 0.9 fewer acres of floodplain filled.

The **Macadam Additional design option**[1] would result in:

- Greater visibility within the Johns Landing activity center, thus providing better support to the desired land use and economic development objectives for the activity centers;
- 1.670 million more square feet of Available Floor Area within new station areas, thus providing for more development/ redevelopment opportunities;
- 2,760 more transit place miles;
- Avoidance of one vibration impact (all vibration impacts in this segment would be eliminated with the identified potential mitigation measures);
- One potential business displacement; and

[1] Than the Willamette Shore Line design option.

[2] Compared to the Willamette Shore Line design option. It would result in approximately one less acre of new impervious surface compared to the Macadam Additional Lane design option.

- Approximately 6.5 more acres of new impervious surface and 0.9 fewer acres of floodplain filled[1].

Table S-3 Environmental Effects and Capital Cost of Streetcar Design Options in Segment 3 – Johns Landing

Measure	Willamette Shore Line	Macadam In-Street	Macadam Additional Lane
Households/Jobs within New Fixed-Guideway Station Areas	4,190 / 11,950	4,600 /12,490	4,600 / 12,490
P.M. In-Vehicle Transit Travel Time Lake Oswego to PSU	29	33	33
Passenger Miles in New Exclusive Transit Right of Way	39,700	32,500	32,500
Station Visibility within Segment Activity Center	Low	High	High
Annual New Transit Ridership (compared to No-Build)	1,277,900	1,180,650	1,180,650
New Congested Intersections (compared to No-Build)	0	2	2
Net Parking Spaces Removed	0	148	175
Change in tons of CO_2 Released by Vehicles (regional from No-Build)	-42.12	-40.51	-40.51
Available Floor Area in New Segment Station Areas (millions of SF)	4.450	6.120	6.120
Potential Displacements	0	0	1
Vibration Impacts (without / with potential mitigation)	3 / 0	5 / 0	5 / 0
Acres of Fill in Floodplain	2.5	1.6	1.6
Acres of New Impervious Surfaces	0.69	6.15	7.20
Segment Capital Cost (2010 dollars)	$19.0	$27.9	$32.7

Source: Metro, TriMet: January 2010. Note: PSU = Portland State University. Average weekday, 2035. SF = square feet.

B. Segment 5 – Dunthorpe/Riverdale. In segment 5, there are two design options considered for the Streetcar Alternative: the Willamette Shore Line and Riverwood Road. The Table S-4 lists several of the ways in which the alternatives would affect the built, natural and social environment for the streetcar design options in segment 5.

The **Willamette Shore Line design option** would result in:

- $10.2 million more local match available from the use of the existing Willamette Shore Line right of way;
- An additional 0.3 miles of exclusive transit right of way;
- No displacements; and
- Approximately two fewer acres of new impervious surface.

In comparison, the **Riverwood Road design option** would result in:

- A savings of $500,000 in capital costs
- Three fewer vibration impacts (there would be no vibration impacts with potential mitigation under either option)
- One potential residential displacement
- Approximately two acres more of new impervious surface
- 2.7 fewer acres of floodplain filled

Table S-4 Environmental Effects and Capital Cost of Streetcar Design Options in Segment 5 – Dunthorpe/Riverdale

Measure	Willamette Shore Line	Riverwood
Potential Displacements	0	1
Vibration Impacts (without / with potential mitigation)	19 / 0	16 / 0
Acres of Fill in Floodplain	2.7	0.0
Acres of New Impervious Surfaces	0.37	2.46
Segment Capital Cost (2010 dollars)	$52.6	$52.1

Source: Metro, TriMet: January 2010. Average weekday, 2035.

2.2.1.1 Capital Improvements

Following is a brief description of the roadway, bicycle and pedestrian and transit (i.e., bus, light rail, excursion trolley, streetcar, operating and maintenance and park-and-ride lot) capital improvements that would occur under the No-Build Alternative. Table 2.2-1 provides a summary of the transit capital improvements associated with the No-Build Alternative and Figure 2.2-1 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. 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 Bond Avenue and two lanes southbound on Moody Avenue);
  - *South Portal* (Phases I and II to extend the Moody / Bond avenues couplet to Hamilton Street and realign Southwest Hood Avenue to connect with Macadam Avenue at 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 Macadam Avenue corridor to improve traffic flow (see Appendix B of the *Lake Oswego to Portland Transit Project Detailed Definition of Alternatives Report* for a comprehensive project list).

- **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 2035 financially-constrained road network of Metro's 2008 RTP. Following is a list of the bicycle and pedestrian project's that would 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 Southwest 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 Northwest/Southwest 5th and 6th avenues between Northwest Glisan Street and Southwest Jackson Street). These bus facilities would remain as is under the No-Build Alternative (the financially-constrained transit project list of the 2035 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 Portland State University 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).

- **Interim Excursion Trolley Capital Facilities.** Under the No-Build Alternative there would be no changes to the existing interim excursion trolley capital facilities that are located within the corridor. The interim excursion trolley uses approximately six-miles of single-tracked Willamette Shore Line tracks and related facilities, including stations at SW Bancroft and Moody streets and at North State Street at A Avenue and a trolley barn at approximately State Street at A Avenue. The interim excursion trolley typically operates one vintage and/or other trolley vehicle propelled by externally attached diesel units. Since 1990, the right of way and related facilities have been used and maintained by the City of Lake Oswego, under agreement with the Willamette Shore Line Consortium, which owns all of the facilities, except for the vehicles. Excursion trolley vehicles are owned and operated by the Oregon Electric Railway Historical Society, under an agreement with the City of Lake Oswego.

- **Streetcar Improvements and Vehicles.** Under the No-Build Alternative, the existing Portland Streetcar Line would continue to operate between Northwest 23rd Avenue and 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 Northeast and Southeast Portland on North and Northeast Broadway and Northeast and Southeast Martin Luther King Boulevard and Northeast and Southeast 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 Portland to 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: shared-use 30-space park-and-ride lot at Christ Church (1060 SW Chandler Road), shared-use 34-space park-and-ride lot at Lake Oswego United Methodist Church (1855 South Shore Boulevard), and 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 Northwest 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).

2.2.1.2 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 2.2-2). Figure 2.2-1 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 2.2-1). 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 increases in TriMet bus route frequency to avoid peak overloads and/or maintain schedule reliability, increases in run times to maintain schedule reliability, and 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). Under the No-Build Alternative, Line 35 and Line 36 would combine to operate every 15 minutes between downtown Portland and downtown Lake Oswego during the two-hour peak periods and Line 35 would operate every fifteen minutes during the off-peak (average weekdays in 2035). In addition, lines 36 and 37 would be extended west to King City and Sherwood, respectively, to increase connections to the Westside Express Service (WES) commuter rail line. Further, a new Line 41 would be added across the Sellwood Bridge, connecting the Beaverton and Clackamas Town Center transit centers.

- **Streetcar Operating Characteristics**. Under the No-Build Alternative, the City of Portland, through an operating agreement with the Portland Streetcar, Inc., would continue to operate the existing Portland Streetcar line. The Portland Streetcar line would operate between Northwest Portland and the South Waterfront District, via downtown Portland (see Figure 2.2-1). 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.

2.2.2 Enhanced Bus Alternative

This section describes the roadway, bicycle and pedestrian and transit capital improvements and transit operating characteristic 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.

2.2.2.1 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 2.2-1 and Figure 2.2-2).

- **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 Lowell Street under the No-Build Alternative would be consolidated into 13 bus stops, which would continue to be served by 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.

- **Interim Excursion Trolley Capital Improvements.** There would be no change in interim 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.

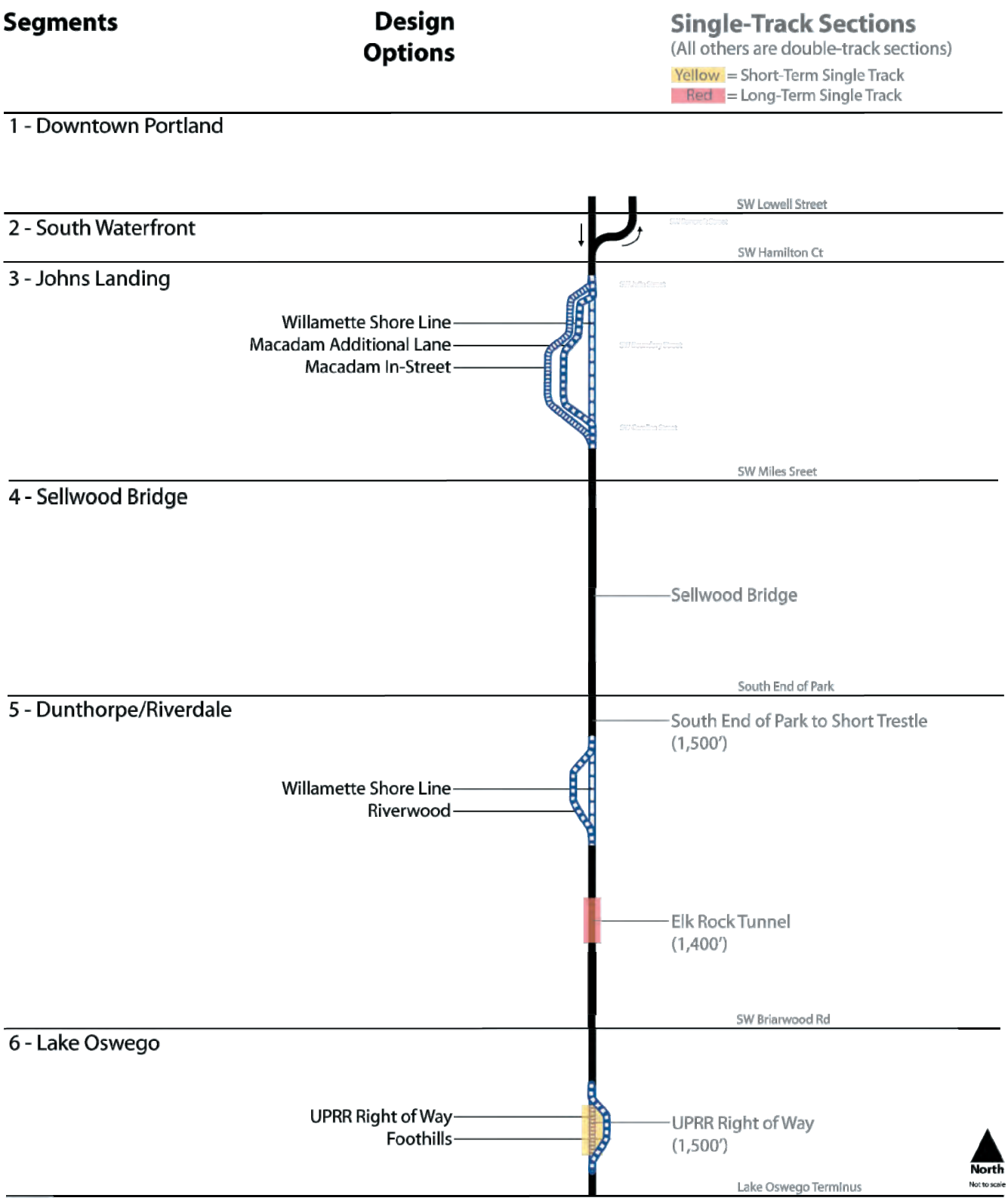
- **Park-and-Ride Facilities.** In addition to the park-and-ride facilities included under the No-Build Alternative, the Enhanced Bus Alternative would include a 300-space structured park-and-ride lot that would be located at Oswego Village Shopping Center on Highway 43 in downtown Lake Oswego (see Figure D-1 in Appendix D). 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).

2.2.2.2 Transit Operations

This section summarizes the corridor's transit operations under the Enhanced Bus Alternative, focusing on bus and streetcar operations. Figure 2.2-2 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



Schematic of Streetcar Alternative Segments, Alignments and Design Options **Figure 2.2-4**

Table 2.3-1 Line Item[1] and Total[2] Capital Costs of the Enhanced Bus and Streetcar Alternatives[3] (2010 dollars, in millions)

		Streetcar[3]	
Cost Category[1]	**Enhanced Bus**	**Low Cost[6]**	**High Cost[6]**
Guideway and Track Elements	$0.0	$48.7	$53.2
Stations/Transit Stops	$9.9	$14.4	$14.8
Support Facilities[4]	$3.5	$6.0	$6.0
Sitework	$2.1	$36.8	$41.7
Systems	$0.1	$19.0	$21.5
Right of Way	$2.2	$76.4	$107.7
Vehicles[4]	$9.6	$48.4	$48.4
Professional Services	$8.6	$29.0	$41.2
Unallocated Contingencies[5]	$1.8	$10.2	$12.9
Total	**$37.8**	**$288.9**	**$347.4**

Source: TriMet – September 2010. Note: costs are in constant (2010) dollars, in millions and may not sum due to rounding.

[1] Based on the Federal Transit Administration's Standard Cost Categories as specified in the Reporting Instructions for the Section 5309 New Starts Criteria (FTA: June 2009).

[2] Total costs do not reflect inflation or finance costs. See Chapter 5 – Finance for year-of-expenditure cost estimates, which do reflect inflation and finance costs. Also, total costs for the Streetcar Alternative do not reflect a savings of $6.8 million resulting from fewer bus purchases, compared to the No-Build Alternative (see Table 2.2.2 for information on the bus fleet requirements under the various alternatives).

[3] The ranges of cost estimates for the Streetcar Alternative are the result of various combinations of design options under study in five of the six segments of the corridor – see Table 2.3.2 for a summary of Streetcar Alternative costs by segment and by design options with each segment, where applicable.

[4] Support facilities (e.g. operating and maintenance facility) and vehicles are considered system costs and they do not vary by Streetcar Alternative design option.

[5] Unallocated contingencies are 5 percent of the total of the other line items, excluding the value of the Willamette Shore Line right of way.

[6] The Streetcar Alternative "Low Cost" assumes the following options by segment- South Waterfront: Willamette Shore Line, Johns Landing: Willamette Shore Line, Sellwood Bridge: New Interchange, Dunthorpe/Riverdale: Riverwood In-Street, Lake Oswego: UPRR ROW. The Streetcar Alternative "High Cost" assumes the following options by segment- South Waterfront: South Portal, Johns Landing: Macadam Additional Lane, Sellwood Bridge: Willamette Shore Line, Dunthorpe/Riverdale: Willamette Shore Line, Lake Oswego: Foothills.

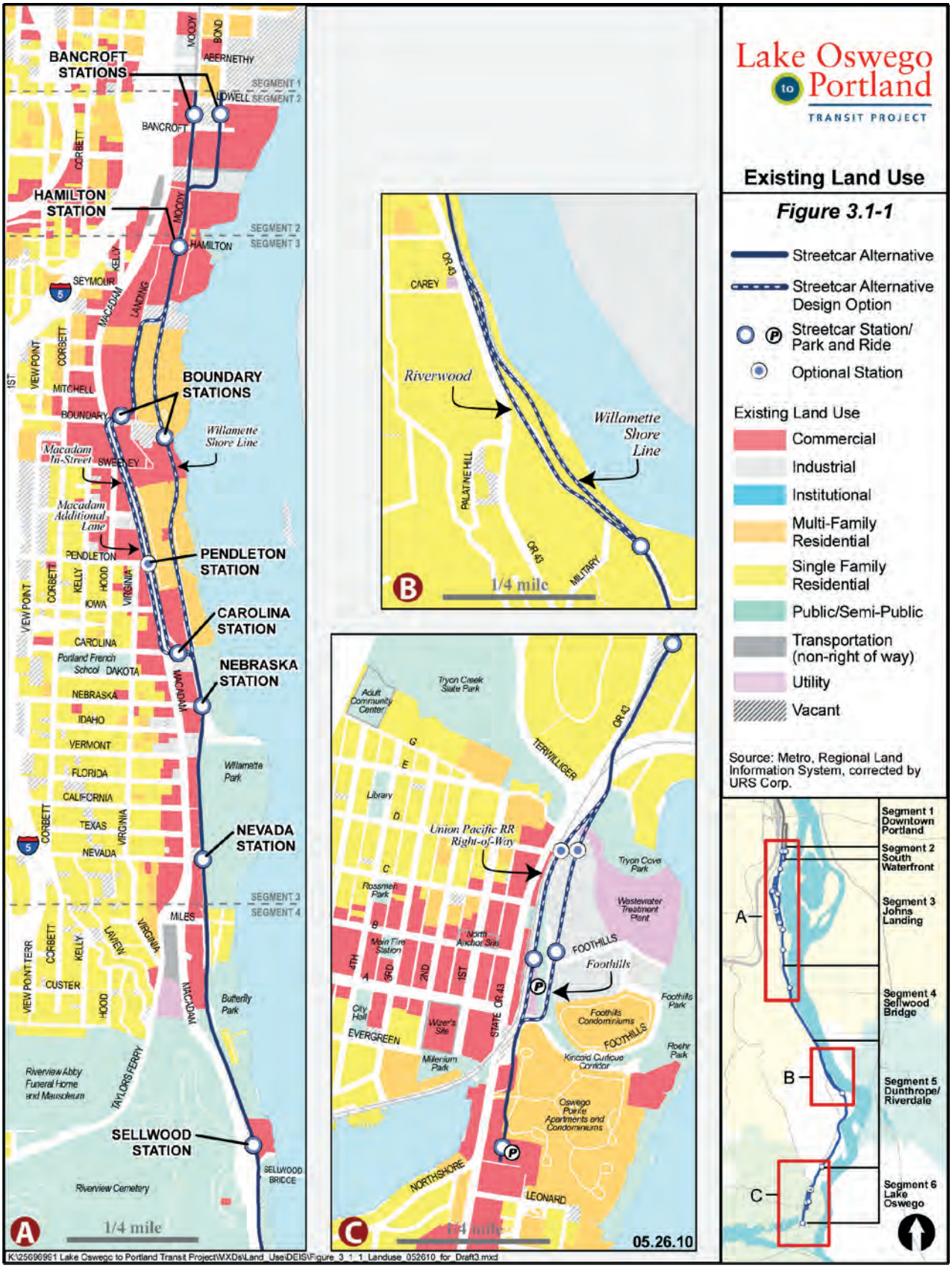
Table 2.3-2 Summary of Capital Costs[1] by Segment for the Enhanced Bus Alternative (in millions, 2010 dollars)

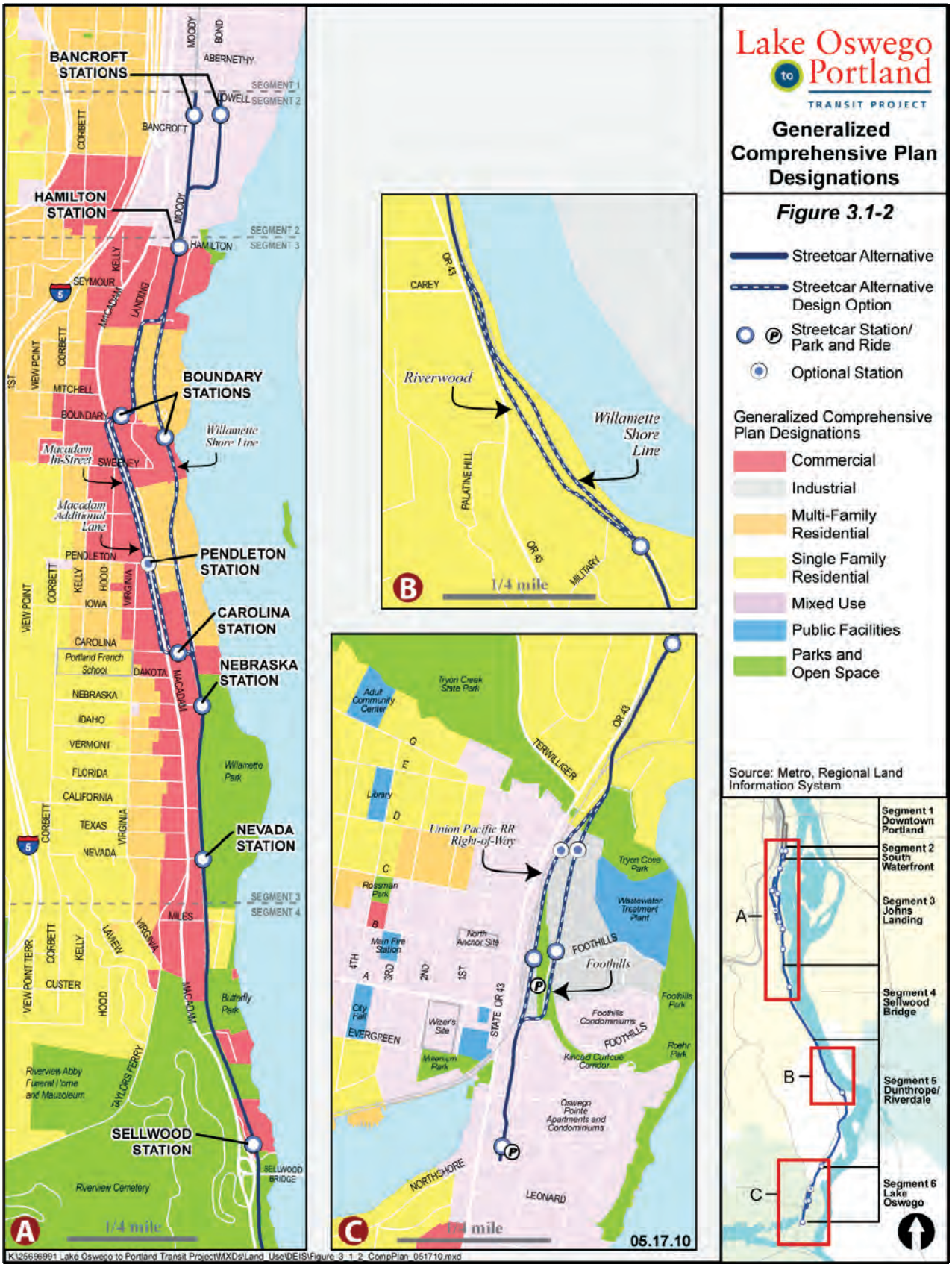
Segment	**Cost[2]**
1 – Downtown Portland	$0.0[3]
2 – South Waterfront	$0.0[3]
3 – Johns Landing	$0.0[3]
4 – Sellwood Bridge	$0.0[3]
5 – Dunthorpe/Riverdale	$0.0[3]
6 – Lake Oswego	$17.8

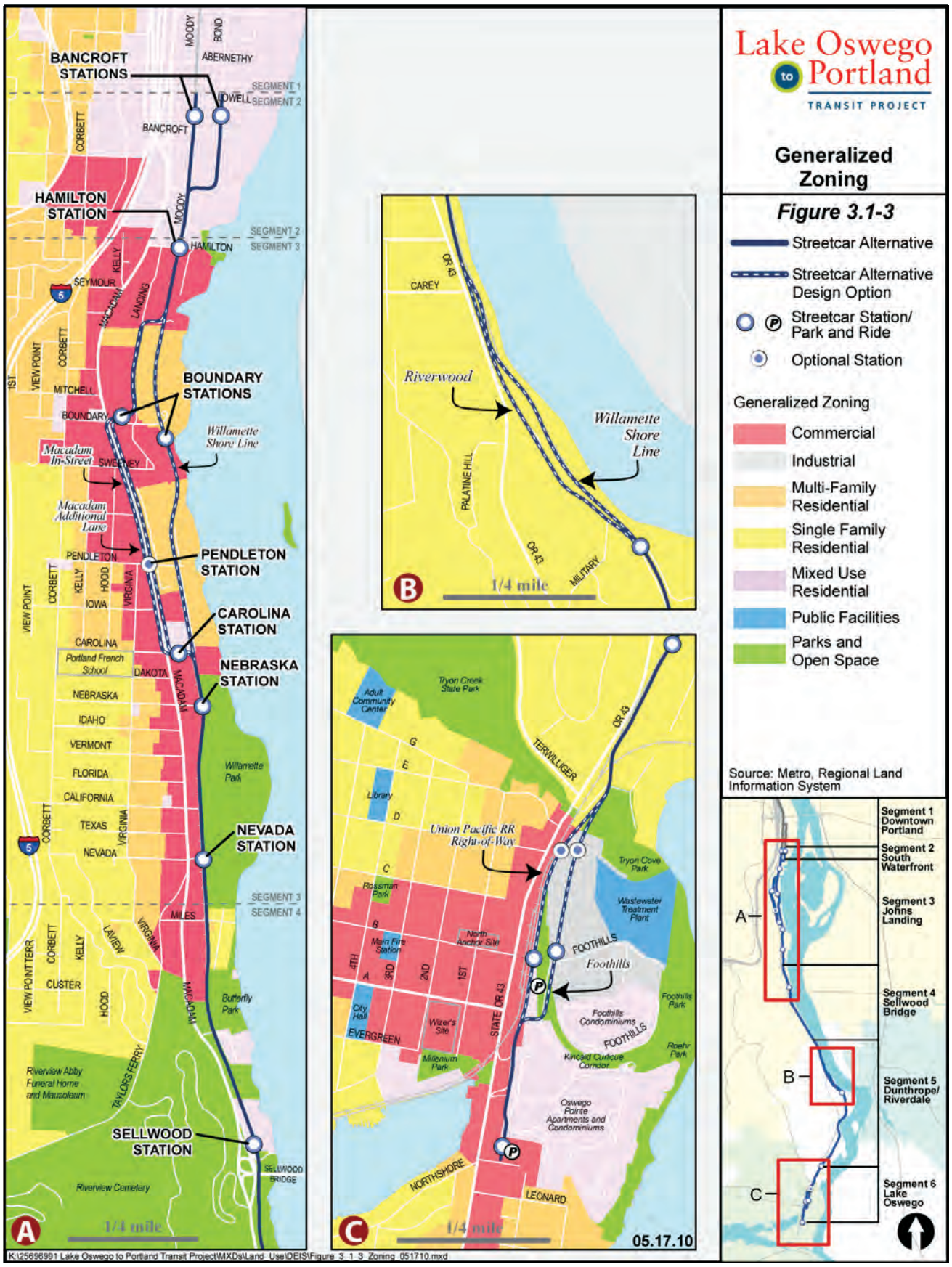
Source: TriMet – September 2010.[1] In millions of 2010 dollars and does not include finance costs. Based on operations in 2035. See Chapter 5 for a capital cost estimate in year-of-expenditure dollars, which includes adjustments for inflation and finance costs. Figure 2.2-5 illustrates the project's segments.

[2] All Enhanced Bus capital costs are based on meeting demand in 2035. Segment costs do not include any system costs (e.g., O&M facility, vehicles), or unallocated contingency, which would be 5 percent of costs (see Table 2.3-1).

[3] There would be negligible capital costs in these segments due to the removal of bus stops.


Lake Oswego to Portland
TRANSIT PROJECT
Existing Land Use
Figure 3.1-1
Streetcar Alternative
Streetcar Alternative Design Option
Streetcar Station/ Park and Ride
Optional Station
Existing Land Use
Commercial
Industrial
Institutional
Multi-Family Residential
Single Family Residential
Public/Semi-Public
Transportation (non-right of way)
Utility
Vacant
Source: Metro, Regional Land Information System, corrected by URS Corp.
BANCROFT STATIONS
HAMILTON STATION
BOUNDARY STATIONS
PENDLETON STATION
CAROLINA STATION
NEBRASKA STATION
NEVADA STATION
SELLWOOD STATION
Willamette Shore Line
Macadam In-Street
Macadam Additional Lane
Riverwood
Willamette Shore Line
Union Pacific RR Right-of-Way
Segment 1 Downtown Portland
Segment 2 South Waterfront
Segment 3 Johns Landing
Segment 4 Sellwood Bridge
Segment 5 Dunthrope/ Riverdale
Segment 6 Lake Oswego
1/4 mile
05.26.10


Lake Oswego to Portland
TRANSIT PROJECT
Generalized Comprehensive Plan Designations
Figure 3.1-2
Streetcar Alternative
Streetcar Alternative Design Option
Streetcar Station/ Park and Ride
Optional Station
Generalized Comprehensive Plan Designations
Commercial
Industrial
Multi-Family Residential
Single Family Residential
Mixed Use
Public Facilities
Parks and Open Space
Source: Metro, Regional Land Information System
BANCROFT STATIONS
HAMILTON STATION
BOUNDARY STATIONS
PENDLETON STATION
CAROLINA STATION
NEBRASKA STATION
NEVADA STATION
SELLWOOD STATION
Willamette Shore Line
Macadam Additional Lane
Riverwood
Union Pacific RR Right-of-Way
SEGMENT 1
SEGMENT 2
SEGMENT 3
SEGMENT 4
1/4 mile
05.17.10
Segment 1 Downtown Portland
Segment 2 South Waterfront
Segment 3 Johns Landing
Segment 4 Sellwood Bridge
Segment 5 Dunthrope/ Riverdale
Segment 6 Lake Oswego


Lake Oswego to Portland
TRANSIT PROJECT
Generalized Zoning
Figure 3.1-3
Streetcar Alternative
Streetcar Alternative Design Option
Streetcar Station/ Park and Ride
Optional Station
Generalized Zoning
Commercial
Industrial
Multi-Family Residential
Single Family Residential
Mixed Use Residential
Public Facilities
Parks and Open Space
Source: Metro, Regional Land Information System
BANCROFT STATIONS
HAMILTON STATION
BOUNDARY STATIONS
PENDLETON STATION
CAROLINA STATION
NEBRASKA STATION
NEVADA STATION
SELLWOOD STATION
Macadam In-Street
Macadam Additional Lane
Willamette Shore Line
Riverwood
Union Pacific RR Right-of-Way
Foothills
SEGMENT 1
SEGMENT 2
SEGMENT 3
SEGMENT 4
Segment 1 Downtown Portland
Segment 2 South Waterfront
Segment 3 Johns Landing
Segment 4 Sellwood Bridge
Segment 5 Dunthrope/ Riverdale
Segment 6 Lake Oswego
1/4 mile
05.17.10
K:\25696991 Lake Oswego to Portland Transit Project\MXDs\Land_Use\DEIS\Figure_3_1_3_Zoning_051710.mxd

The Streetcar Alternative would comply with all of the TSP and South Waterfront Plan policies quoted above except objective C under TSP Policy 6.24, Public Transportation. The Segment 3 design options would be the same in this respect. The Enhanced Bus Alternative would comply with only objective C under TSP Policy 6.24. The No-Build Alternative would comply with none of these policies. The Streetcar Alternative is in the Portland Streetcar System Concept Plan. The No-Build and Enhanced Bus Alternatives are inconsistent with inclusion of the Streetcar Alternative in the Portland Streetcar System Concept Plan.

3.1.4.2 Other Policies

As described above, this subsection summarizes: a) instances where design features of the build alternatives and options would not comply with applicable regional, city, and county policies; b) how an alternative or option could be modified to comply; and c) how the policy could be modified to make the alternative or option comply with it. Except in the instances listed here, the build alternatives would comply with policies addressing design features. This subsection summarizes analysis contained in the *Land Use and Planning Technical Report* (URS, August 2010).

Enhanced Bus Alternative

- Would not meet 2035 RTP Objective 6.1, which states, "Avoid or minimize undesirable impacts on fish and wildlife habitat conservation areas, wildlife corridors, significant flora and open spaces." This is because the Enhanced Bus Alternative would adversely impact aquatic habitat, while the Streetcar Alternative would not. See Section 3.8 Ecosystems.

- Would be inconsistent with a provision of Portland TSP Policy 6.6, which states, "Employ transit-preferential measures, such as signal priority and bypass lanes."[26] Adding bypass lanes to the Enhanced Bus Alternative would not be feasible in much of the corridor. Analysis conducted during the alternatives analysis concluded that such lanes would have to be continuous, because of the length of traffic queues. Adding additional lanes was found to be infeasible in much of the corridor. Adding signal priority without bypass lanes would achieve partial compliance. While it would not substantially improve speeds without adding bypass lanes, it would achieve compliance with TSP Policy 6.10, described below. To avoid noncompliance, "where feasible" could be added to the TSP Policy 6.6 sentence quoted above, so that it would read, "Where feasible, employ transit-preferential measures, such as signal priority and bypass lanes."

- Would not comply with Portland TSP Policy 6.10, which states "Design treatments on Major Emergency Response Streets should enhance mobility for emergency response vehicles by employing preferential or priority treatments."[27] The TSP classifies Macadam Avenue/Highway 43 as a major emergency response route.[28] As with Policy 6.6, discussed above, adding signal priority would achieve compliance. Alternatively, as with Policy 6.6, to avoid noncompliance, "where feasible" could be added to the SP Policy 6.10 sentence quoted above, so that it would read, "Where feasible, design treatments on Major Emergency Response Streets should enhance mobility for emergency response vehicles by employing preferential or priority treatments."

[26] *Ibid*., p. 2-10.
[27] *Ibid*., p. 2-15.
[28] *Ibid*., Map 6.41.6, p. 2-106.

Streetcar Alternative

- Would be in substantial, but not technical, compliance with providing an "Off-Street Path" in the vicinity of the existing Willamette Shore Line alignment south of Miles Street. This is because there would be no off-street path for about 600 feet of the length of the path, as shown on the Portland TSP bicycle and pedestrian classifications maps for the Southwest District.[29] A draft report prepared for Metro has identified how an off-street trail could be routed, if a streetcar alternative were implemented, including in conjunction with the replacement of the Sellwood Bridge.[30] It shows the path as the "Greenway Off-Street Path," which would parallel the WSL alignment south to a point north of Radcliffe Road. South of this point, the report shows only an "On-Street Facility" on Highway 43. This point is a short distance north of the Portland city limits, where the city's comprehensive planning jurisdiction ends.[31] This implies that only the Willamette Shore Line alignment is feasible as an "Off-Street Path" for the approximately 600-foot distance to the city limits. Regarding Off-Street Paths, TSP Policy 6.7.B states:

  > Off-Street Paths are intended to serve as transportation corridors and recreational routes for bicycling, walking, and other non-motorized modes.
  > - Connections. Use Off-Street Paths as convenient shortcuts to link urban destinations and origins along continuous greenbelts such as rivers, park and forest areas, and other scenic corridors, and as elements of a regional, citywide, or community recreational trail plan.
  > - Location. Establish Off-Street Paths in corridors not well served by the street system.[32]

To avoid this instance of technical noncompliance, the TSP could be amended to indicate that substantial provision of an "Off-Street Path" would comply with the plan, even if the path is not provided for along the entire length shown on classification maps.

Streetcar Design Options

- The Macadam In-Street and Macadam Additional Lane design options would not comply with the provision of Portland TSP Policy 6.6 which states, "Employ transit-preferential measures, such as signal priority and bypass lanes."[33] As with the Enhanced Bus Alternative, adding bypass lanes would not be feasible. Analysis conducted during the alternatives analysis concluded that such lanes would have to be continuous, because of the length of traffic queues. Adding additional lanes was found to be infeasible. Adding signal priority without bypass lanes would achieve partial compliance. While it would not substantially improve speeds without adding bypass lanes, it would achieve compliance with TSP Policy 6.10, described below. To avoid this noncompliance, "where feasible" could be added to the TSP Policy 6.6 sentence, to read, "Where feasible, employ transit-preferential measures, such as signal priority and bypass lanes."

- The Macadam In-Street and Macadam Additional Lane design options would not comply with Portland TSP Policy 6.10, which states "Design treatments on Major Emergency Response

[29] City of Portland, Transportation System Plan, April 5, 2007, Map 6.41.3, p. 2-103, and Map 6.41.4, p. 2-104. Because the TSP map and the Metro map referred to are schematic, the 600-foot figure is a rough estimate.
[30] Alta Planning and Design, Lake Oswego to Portland Trail, Draft, July 2009, Map 3.
[31] Under contract with Multnomah County, the City of Portland exercises land use regulatory authority in an area south of the city limits which extends to the boundary between Multnomah and Clackamas Counties. However, Multnomah County retains comprehensive planning authority over the area.
[32] Ibid., p. 2-13.
[33] Ibid., p. 2-10.

Streets should enhance mobility for emergency response vehicles by employing preferential or priority treatments."[34] The TSP classifies Macadam Avenue/Highway 43 as a major emergency response route.[35] As with Policy 6.6, discussed above, adding signal priority would achieve compliance. Alternatively, as with Policy 6.6, to avoid noncompliance, "where feasible" could be added to the SP Policy 6.10 sentence reading, "Design treatments on Major Emergency Response Streets should enhance mobility for emergency response vehicles by employing preferential or priority treatments, where feasible."

[34] Ibid., p. 2-15.
[35] Ibid., Map 6.41.6, p. 2-106.

Table 3.2-1 Local, Regional and State Population and Households 1980 through 2005

Location	1980	1990	2000	2005	Change 1980 to 2005 Percent	Change 1980 to 2005 Actual
Population						
City of Portland[1]	366,400	437,300	529,100	556,400	52	190,000
City of Lake Oswego[2]	22,900	30,600	35,300	40,900	79	18,100
Portland/Vancouver area [2,3]	1,242,600	1,412,300	1,759,100	1,946,000	57	703,400
State of Oregon[1]	2,633,100	2,842,300	3,421,400	3,638,900	38	1,005,800
Households						
City of Portland[1]	158,900	187,300	223,800	235,200	48	76,300
City of Lake Oswego[2]	8,500	12,600	14,800	17,200	102	8,700
Portland/Vancouver area[2,3]	477,800	548,700	696,700	767,000	61	289,200
State of Oregon[1]	991,600	1,103,300	1,333,700	1,425,300	44	433,700
Employment						
City of Portland[1]	173,800	218,800	276,100	424,000	144	250,100
City of Lake Oswego[2]	11,800	16,600	18,300	19,300	64	7,500
Portland/Vancouver area[2,3]	491,200	697,300	906,800	1,032,200	110	541,000
State of Oregon[1]	1,138,400	1,320,000	1,627,800	1,654,400	45	516,000

[1] Source: US Census except for 2005 (PSU Population Research Center, 2008).
[2] Source: Metro, 2009.
[3] The four-county Portland/Vancouver metropolitan area includes all of Multnomah, Clackamas, and Washington Counties in Oregon, and Clark County in Washington.

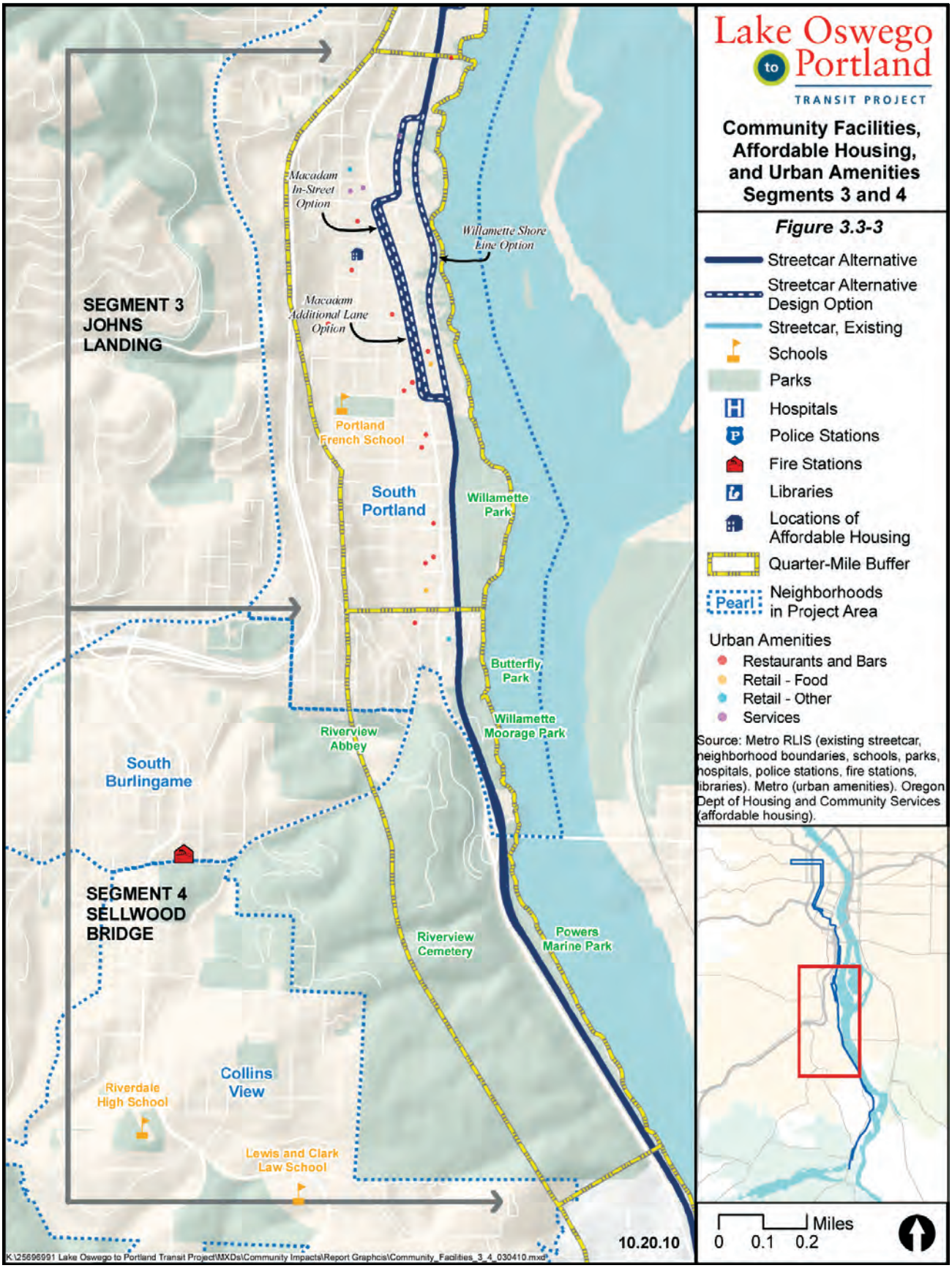
The future growth rate of households in the Lake Oswego to Portland transit corridor from 2005 to 2035 is projected to be double that of the region (i.e., 113 percent compared to 58 percent, respectively), with the number of households in the corridor reaching nearly 66,500 from the 2005 estimate of 31,200. Comparatively, the number of households in the region is expected to grow from 767,000 to over 1,208,600. The future employment growth rate in the corridor will be about two-thirds of the regional average (estimated at nearly 157,200 in 2005, employment in the corridor is expected to grow to 235,500 by 2035 for a growth rate of 50 percent, compared to regional employment growth to nearly 1,799,200 from 1,032,300, or a regional rate of 74 percent). See Table 3.2-2.

Table 3.2-2 Households and Employment, 2005 Estimate and 2035 Forecast

	Households				Employment			
			Growth				Growth	
District	**2005**	**2035**	**Number**	**Percent**	**2005**	**2035**	**Number**	**Percent**
Portland CBD	13,013	34,637	21,624	166	101,203	147,834	46,631	46
Northwest Portland	6,058	7,852	1,794	30	15,198	19,858	4,660	31
South Waterfront/OHSU	2,246	7,324	5,078	226	25,730	42,267	16,537	64
Johns Landing	1,145	3,688	2,543	222	8,083	12,937	4,854	60
Dunthorpe	1,136	1,518	382	34	1,564	2,377	813	52
Lake Oswego	7,578	11,477	3,899	51	5,415	10,235	4,820	89
Corridor Total	**31,176**	**66,496**	**35,320**	**113**	**157,193**	**235,508**	**78,315**	**50**
Region Total	**767,016**	**1,208,649**	**441,633**	**58**	**1,032,316**	**1,799,212**	**766,896**	**74**

Source: Metro, 2009.

The corridor's districts that are forecast to have household growth rates approximately equal to or greater than the regional average are the Portland CBD (166 percent), the South Waterfront/OHSU (226 percent), Johns Landing (222 percent), and Lake Oswego (51 percent). The districts with the


Lake Oswego to Portland
TRANSIT PROJECT
Community Facilities, Affordable Housing, and Urban Amenities Segments 3 and 4
Figure 3.3-3
Streetcar Alternative
Streetcar Alternative Design Option
Streetcar, Existing
Schools
Parks
Hospitals
Police Stations
Fire Stations
Libraries
Locations of Affordable Housing
Quarter-Mile Buffer
Pearl
Neighborhoods in Project Area
Urban Amenities
Restaurants and Bars
Retail - Food
Retail - Other
Services
Source: Metro RLIS (existing streetcar, neighborhood boundaries, schools, parks, hospitals, police stations, fire stations, libraries). Metro (urban amenities). Oregon Dept of Housing and Community Services (affordable housing).
Macadam In-Street Option
Willamette Shore Line Option
Macadam Additional Lane Option
SEGMENT 3 JOHNS LANDING
Portland French School
South Portland
Willamette Park
Butterfly Park
Willamette Moorage Park
Riverview Abbey
South Burlingame
SEGMENT 4 SELLWOOD BRIDGE
Riverview Cemetery
Powers Marine Park
Collins View
Riverdale High School
Lewis and Clark Law School
10.20.10
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Miles
0 0.1 0.2

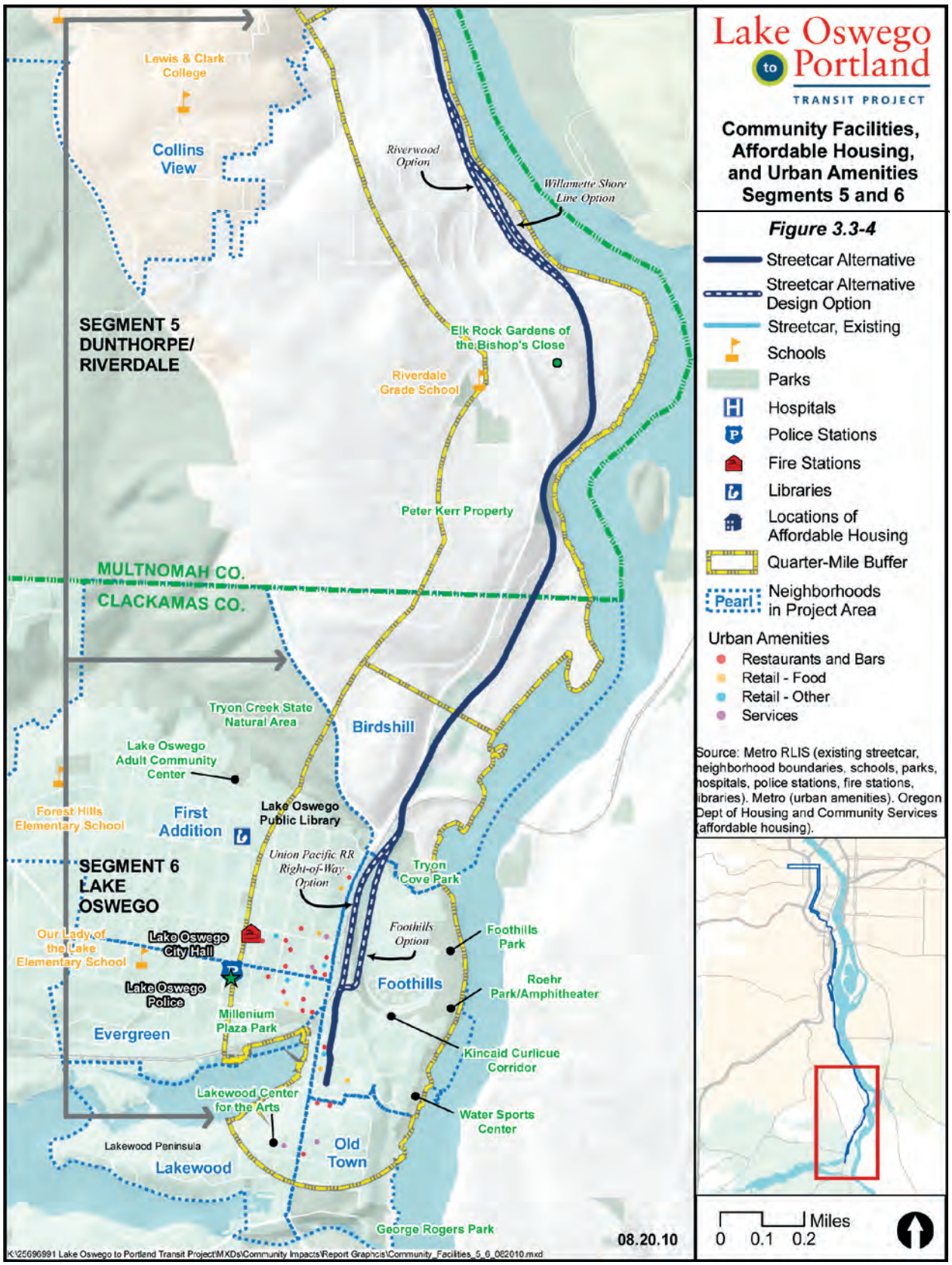
Lake Oswego to Portland
TRANSIT PROJECT
Community Facilities, Affordable Housing, and Urban Amenities Segments 5 and 6
Figure 3.3-4
Streetcar Alternative
Streetcar Alternative Design Option
Streetcar, Existing
Schools
Parks
Hospitals
Police Stations
Fire Stations
Libraries
Locations of Affordable Housing
Quarter-Mile Buffer
Pearl
Neighborhoods in Project Area
Urban Amenities
Restaurants and Bars
Retail - Food
Retail - Other
Services
Source: Metro RLIS (existing streetcar, neighborhood boundaries, schools, parks, hospitals, police stations, fire stations, libraries). Metro (urban amenities). Oregon Dept of Housing and Community Services (affordable housing).
Miles
0 0.1 0.2
Lewis & Clark College
Collins View
Riverwood Option
Willamette Shore Line Option
SEGMENT 5 DUNTHORPE/ RIVERDALE
Elk Rock Gardens of the Bishop's Close
Riverdale Grade School
Peter Kerr Property
MULTNOMAH CO.
CLACKAMAS CO.
Tryon Creek State Natural Area
Birdshill
Lake Oswego Adult Community Center
Forest Hills Elementary School
First Addition
Lake Oswego Public Library
Union Pacific RR Right-of-Way Option
SEGMENT 6 LAKE OSWEGO
Tryon Cove Park
Foothills Option
Foothills Park
Our Lady of the Lake Elementary School
Lake Oswego City Hall
Lake Oswego Police
Foothills
Roehr Park/Amphitheater
Millenium Plaza Park
Evergreen
Kincaid Curlicue Corridor
Lakewood Center for the Arts
Water Sports Center
Lakewood Peninsula
Old Town
Lakewood
George Rogers Park
08.20.10
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Table 3.3-4 Summary of Effects on Neighborhoods by Alternative

Effect on Neighborhoods	No-Build Alternative	Enhanced Bus Alternative	Streetcar Alternative
Cohesion			
Change to established community boundaries or landmarks	No Effects	No Effects	No Effects
Impacts to community facilities or urban amenities	No Effects	No Effects	No Effects
Change in land use	No Effects	No Effects	- Increased potential for redevelopment in Segment 2 (both options) - Increased potential for redevelopment in Segment 3 (Macadam options only) - Increased potential for redevelopment in the northern end of Segment 4 - Increased potential for redevelopment in Segment 6
Change in visual environment	No Effects	- No moderate or high visual impacts	- Moderate visual impact in Segment 3 (all options) - Moderate visual impact in Segment 5 (WSL option) - Moderate-high degree of visual impact in Segment 5 (Riverwood option) - Moderate visual impact in Segment 6 (both options)
Quality of Life			
Noise or air quality impacts	No Effects	No Effects	- Moderate noise impacts in Segment 3 (WSL option only) - Moderate noise impacts in Segment 4 - One potential severe noise impact to a residential property in Segment 5 (both options) however, this could be mitigated with sound walls to at least a moderate level - Moderate noise impacts to 14-15 residences in Segment 5 (WSL option) or 11-12 residences in Segment 5 (Riverwood option)
Impacts to parks and recreational facilities	No Effects	- Improved transit access to parks	- Improved transit access to parks
Impacts to affordable housing units	No Effects	No Effects	No Effects
Mobility			
Traffic	- Increased VMT - Increased congestion at several intersections	- Slight increase in traffic volumes in Segment 6 due to the park and ride, but this would not result in substantial additional congestion	- Overall improvement to traffic operations in Segments 2-5 - The installation of a traffic signal at SW Macadam Avenue and SW Carolina Street in Segment 3, under the Macadam options, would lead to congestion in that area - Potential for unauthorized parking in Segment 3 (Macadam options only) - Congestion in Segment 6 (both options)
Transit Travel Times	No Effects	- Decrease in transit travel times	- Decrease in transit travel times in all segments
Access to Transit	No Effects	- Decrease in access to transit in Segment 3 - Decrease in access to transit in Segment 5 - Decrease in access to transit in Segment 6	- Small decrease in access to transit in Segments 3 and 4 - Large decrease in access to transit in Segment 5 - Moderate decrease in access to transit in Segment 6
Change in bicycle and pedestrian facilities	No Effects	- Improved facilities associated with the park and ride facility	- New bicycle/pedestrian overcrossing in Segment 4 - Improvements to sidewalks and bicycle lanes in Segment 5 (Riverwood In-Street Option only) - New bicycle and pedestrian connections under UPRR rail line and over Tryon Creek in Segment 6 (both options)
Property Acquisition/ Displacement			
Residential (Partial/Full)	None	- 1 residential acquisition in Segment 6	- Maximum 16 acquisitions (assuming Macadam Add-Lane and Riverwood options are chosen) - 1 residential displacement in Segment 5, if Riverwood option is chosen
Commercial (Partial/Full)	None	- 7 commercial acquisitions in Segment 6	- Maximum 28 acquisitions (assuming Macadam Add-Lane is chosen) - 1 commercial displacement in Segment 3 under Macadam Add-Lane
Public/Institution (Partial/Full)	None	None	- Maximum 9 acquisitions
Industrial	None	None	- Maximum 7 acquisitions, assuming Foothills option is chosen - 5 displacements in Segment 6 under the Foothills option

Moorage and Powers Marine parks would have moderate sensitivity due to the location of the project in relation to the parks. The project would occur on the western boundaries of the parks and would not block park users' views to the Willamette River or interfere with park functions. Businesses in the area would have low to moderate sensitivity depending on proximity. The overall viewer sensitivity would be low to moderate.

Visual changes would include new stations, retaining walls varying in height, a new structure over Stephens Creek, fencing and a pedestrian overpass to Powers Marine Park. Existing vegetation would be removed in multiple locations. These visual changes would occur due to the Sellwood Bridge project, and have been evaluated as part of that project. The overall degree of change associated with this design option would be low to moderate.

Overall visual impacts with this design option would be low to moderate.

Segment 5 – Dunthorpe/Riverdale

Willamette Shore Line Design Option. Viewers in the Dunthorpe/Riverdale segment in proximity to the Willamette Shore Line design option include residents, visitors and motorists. Neighborhood residents would have foreground and middleground views of the project and moderate to high sensitivity depending on their proximity to the project area. Motorists would have low sensitivity to the visual impacts due to elevation differences, the speed at which they would be traveling and the short duration they would be exposed to it. The overall viewer sensitivity would range from low to high depending on the viewers proximity to the project area.

Visual changes would include trackway improvements, new stations, retaining walls varying in height, fences, lighting around the stations, reconstruction of existing trestles and a reconstructed Southwest Briarwood Road overcrossing. Intersection improvements would occur and existing trestles would be replaced. Some existing vegetation and landscaping would be removed in various locations. The area is predominately a residential neighborhood, and while topography reduces the visual impacts for properties on the west side of the project, the project could potentially disrupt views toward the Willamette River. The removal of vegetation could reduce the visual buffering between the existing railroad corridor and the adjacent residences. Introducing streetcar stations and related infrastructure would be somewhat of a departure from the existing visual character of the neighborhood. The overall degree of change would range from low to high.

Overall visual impacts with this design option would be moderate. Mitigation in areas with higher visual impacts could include enhanced screening and use of vegetation to soften visual impacts of retaining walls, shielding station lighting to reduce impacts from glare, minimizing project width where appropriate, and designing the facilities to complement or blend with the surrounding landscapes and communities.

Riverwood Design Option. Viewers in proximity to the Riverwood design option would be the same as the Willamette Shore Line design option. The overall viewer sensitivity would range from low to high depending on the viewers proximity to the project area.

Visual changes in the area include trackway improvements, a new trestle, new stations, retaining walls varying in height, fences, lighting around the stations and a new Southwest Briarwood Road overcrossing. The intersection of Riverwood Road and Riverside Drive/Highway 43 would be closed. Riverwood Road would be widened and regraded. One house would be removed. Some

existing vegetation and landscaping would be removed in various locations. Visual changes would occur primarily in and adjacent to the existing road right of way, but the changes would alter the visual character of the street. Retaining walls would be built on the downhill side of SW Riverwood Road, potentially removing mature vegetation and screening between the roadway and the adjacent residences. The visual character of the road would change from a meandering unimproved residential street to a more urban roadway with sidewalks, curbs and bike lanes. Introducing streetcar stations and related infrastructure could be a departure from the visual character of the neighborhood. The overall degree of change would range from low to high.

Overall visual impacts with this design option would be moderate to high. Mitigation could include enhanced screening and use of vegetation to soften visual impacts of retaining walls, shielding station lighting to reduce impacts from glare, minimizing project width and street standards where appropriate, and designing the facilities to complement or blend with the surrounding landscapes and communities.

Segment 6 – Lake Oswego

Union Pacific Railroad Right of Way Design Option. Viewers in the Lake Oswego segment in proximity to the Union Pacific Railroad design option include motorists, residence, pedestrians, bicyclists, employees/business people, industrial workers and shoppers. Neighborhood residents would have foreground and middleground views of the project and moderate sensitivity depending on proximity to the project area. Adjacent business people, industrial workers and shoppers would have foreground and middleground views and low to moderate sensitivity. Commuters would have low sensitivity. Recreation users would have moderate sensitivity. The overall viewer sensitivity would be low to moderate.

Visual changes in the area would include new retaining walls height, a pedestrian and bike connection from Southwest Fielding Road, transit undercrossing of the freight rail line, a trestle over Tryon Creek, new stations, a stairway connection from B Avenue, new surface parking lots and a new parking structure. The roadway would be widened and reconfigured. The Union Pacific Railroad track would shift 15 feet to the west. Existing vegetation would be removed. The visual impacts from the project would occur primarily in the existing railroad corridor adjacent to industrial uses. Much of the project would be lower in elevation from State Street/Highway 43 and behind existing buildings maintaining the existing visual character of downtown Lake Oswego. Visual changes associated with the project could help unify the east and west sides of State Street and promote stronger visual and physical connections to the Willamette River. The moderate to high degree of change near the parking structure would be mitigated through design development with the City of Lake Oswego. Given the visual benefit the project could have on the area, the overall degree of change would be moderate.

Overall visual impacts with this design option would be moderate. Mitigation could include enhanced screening and terracing to soften visual impacts of retaining walls and designing the facilities to complement the aesthetics of downtown Lake Oswego.

Foothills Design Option. Viewers in proximity to the Foothills design option would be the same as the Union Pacific Railroad design option. The overall viewer sensitivity would be low to moderate.

Visual changes in the area would include new retaining walls varying in height, a pedestrian and bike connection from Southwest Fielding Road, streetcar crossing below the existing freight rail line,

Table 4.5-1 Summary of Impacts of Streetcar Alternative on Existing or Funded Bicycle/Pedestrian Facilities, By Segment and Design Option

Location	Facility Type	Direction	Extent of Facility in Proximity to Project	Design Considerations
Segment 1 – Downtown Portland				
None				
Segment 2 – South Waterfront[1]				
SW Moody	On-Street Bike Lane	SB	SW Lowell - SW Bancroft	Parallel; separation at station; perpendicular crossing; box left turn
SW Bond	On-Street Bike Lane	NB	SW Bancroft - SW Lowell	Bike lane on right side of street opposite streetcar tracks
SW Bond (new street)	New connection to existing Greenway Trail	EB/WB	Willamette Shore Line - Willamette Greenway Trail	Interim connection; near perpendicular crossing
Willamette Greenway Trail	Existing bike path	NB/SB	SW Bancroft - SW Moody	Extend and formalize multi-use path
Segment 3 – Johns Landing: Willamette Shore Line Design Option				
Willamette Greenway Trail	Existing/funded bike/ pedestrian path	NB/SB	SW Hamilton Ct - SW Miles Ct	Crossing improvements
Segment 3 – Johns Landing: Macadam Additional Lane Design Option				
Willamette Greenway Trail	Existing/funded bike/ pedestrian path	NB/SB	SW Hamilton Ct - SW Miles Pl	Parallel facilities; WSL right of way could potentially be used for future bike path
Segment 3 – Johns Landing: Macadam In-Street Design Option				
Willamette Greenway Trail	Existing/funded bike/pedestrian path	NB/SB	SW Hamilton Ct - SW Miles Pl	Parallel facilities; WSL right of way could potentially be used for future bike path
Segment 4 – Sellwood Bridge[1]				
Sellwood Bridge Replacement Project	Funded bike/ pedestrian facilities	EB/WB	Highway 43 - SE Grand Av	Connection with new bridge bike/pedestrian facilities
Powers Marine Park	New overcrossing connection to Powers Marine Park	EB/WB	Highway 43 - Powers Marine Park	New connection; grade-separated
Segments 5 and 6				
Kincaid Curlicue Corridor	Local Trail/Pathway	EB/WB	Foothills Road – Roehr Park	New connection

Source: City of Portland, City of Lake Oswego URS: March 2010
Notes: EB = eastbound, WB = westbound, NB = northbound, SB = southbound. Additional details of the crossings of the Willamette Shore Line right of way are noted in the track crossings table on page CS-020 of the *LOPT Transit Project Streetcar Plan Set*, November 9, 2009. Sidewalks are provided on many streets and bicycle travel is allowed on all streets in the study area.
[1] 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.