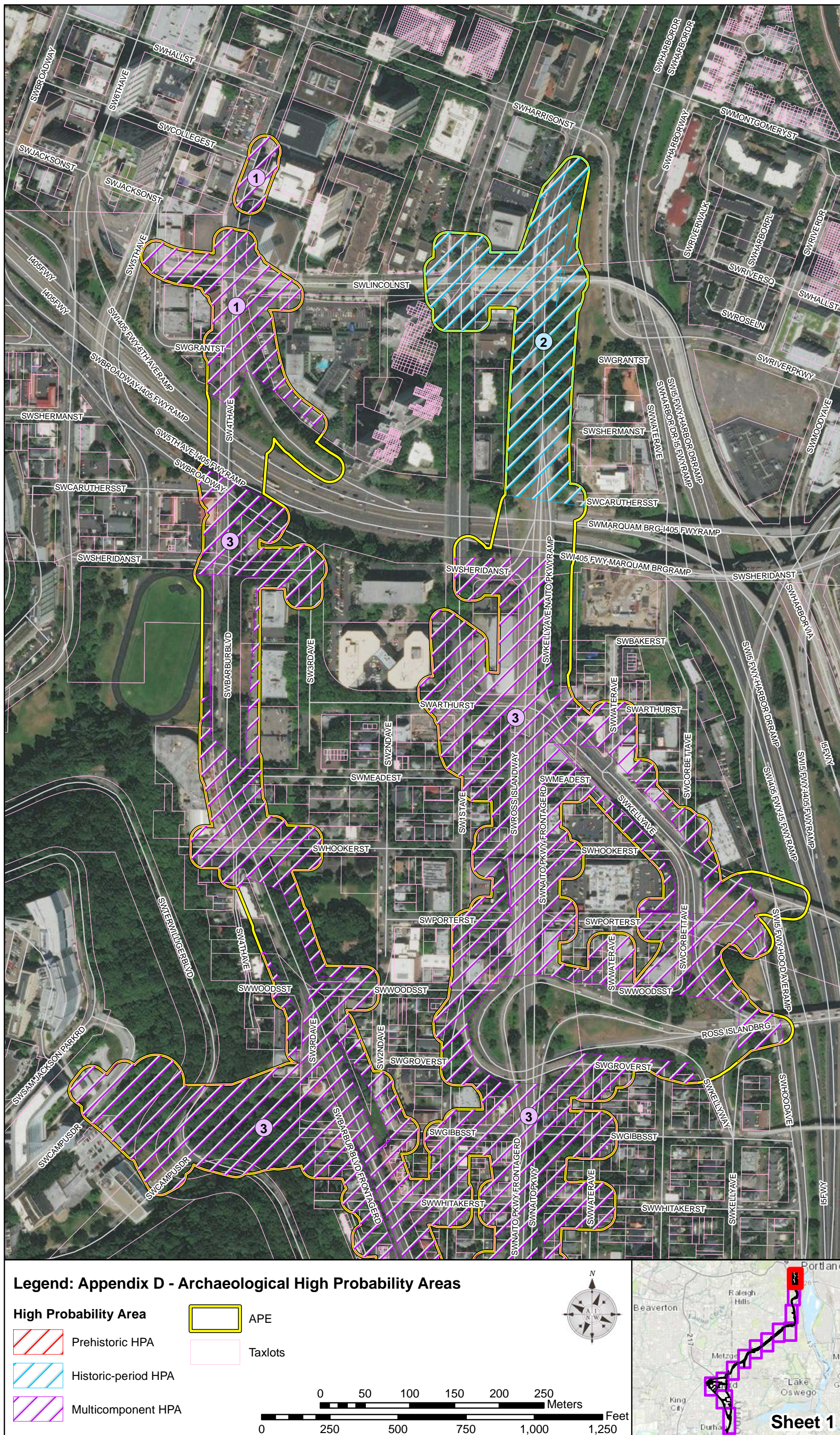


## **APPENDIX D**

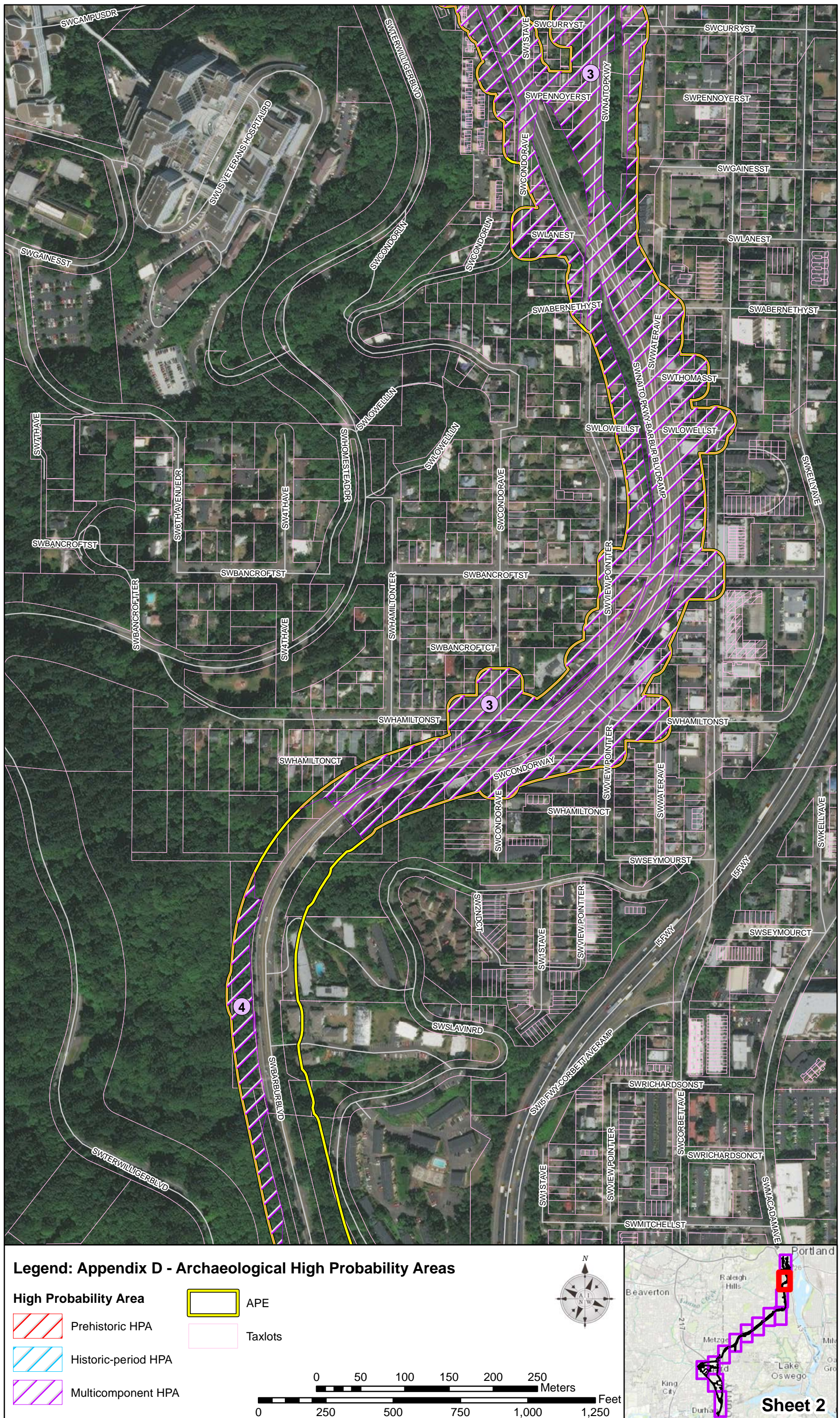
### **MAP ATLAS OF ARCHAEOLOGICAL HIGH PROBABILITY AREA (HPA) LOCATIONS**

*The HPA numbers in circles correlate with the text  
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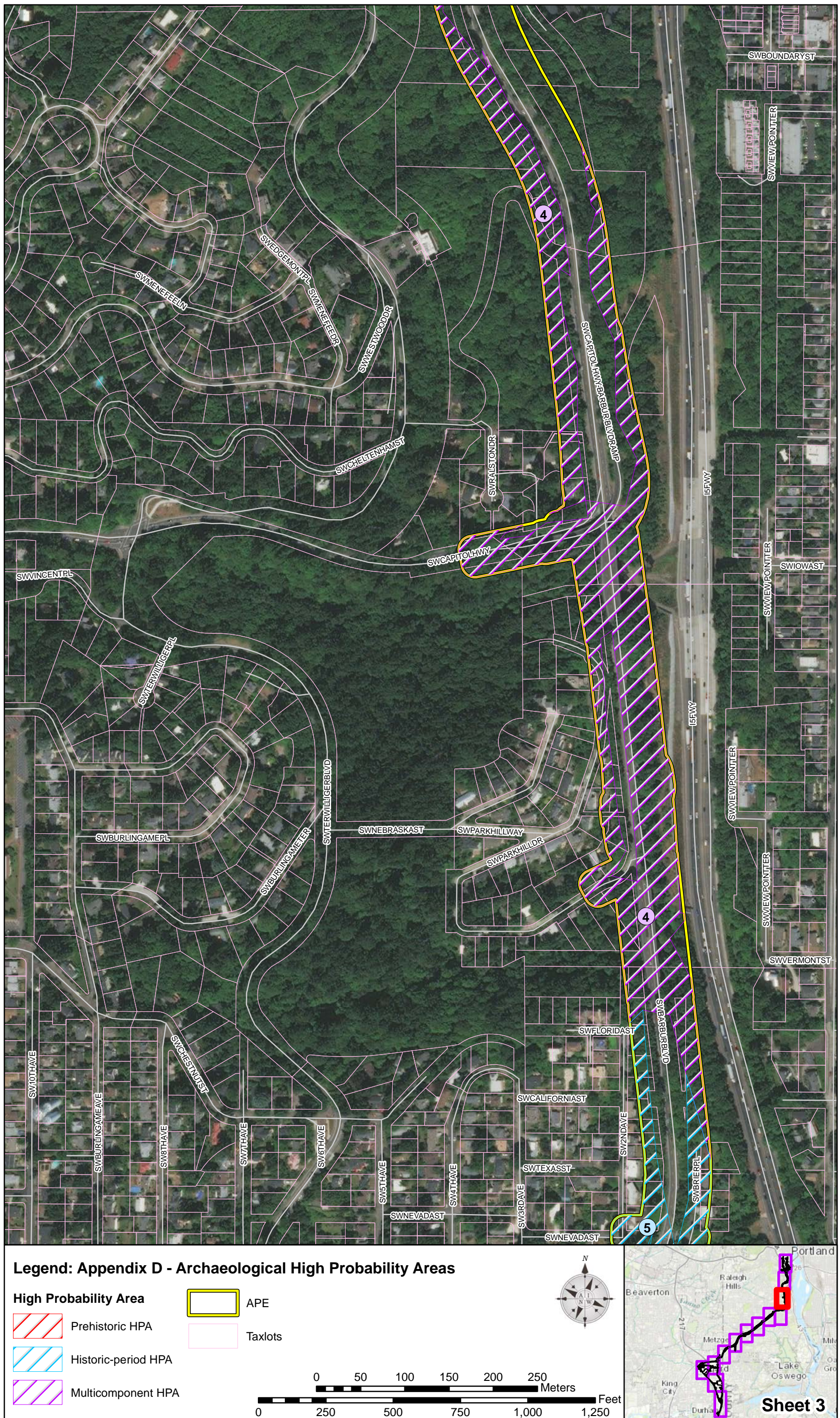




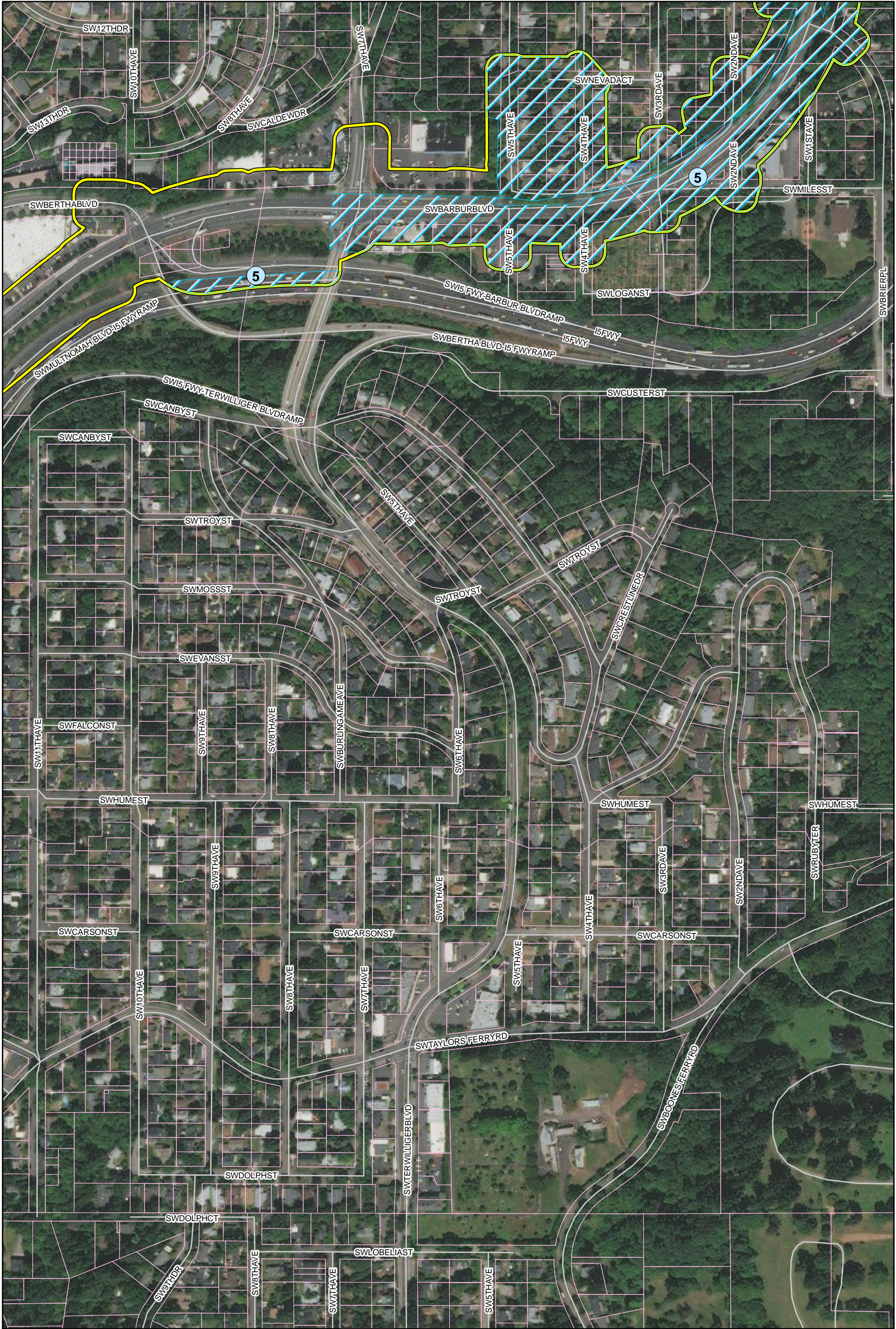






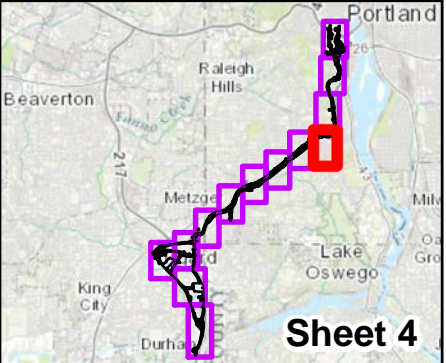
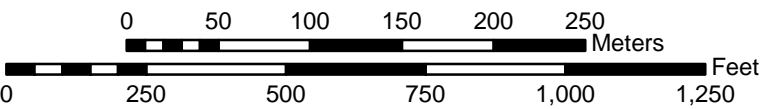




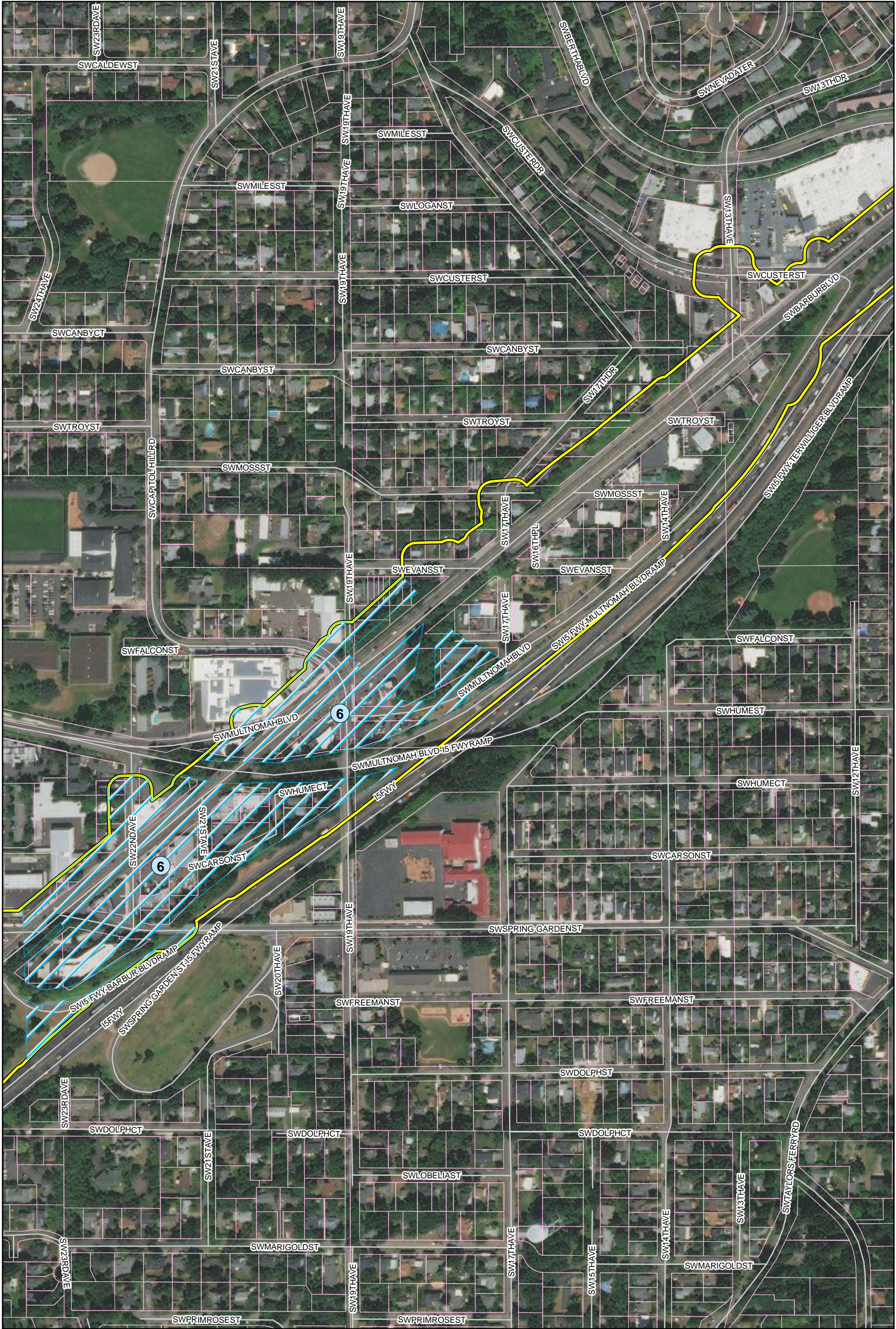


Legend: Appendix D - Archaeological High Probability Areas

- High Probability Area
- Prehistoric HPA
  - Historic-period HPA
  - Multicomponent HPA
- APE
- Taxlots









**Legend: Appendix D - Archaeological High Probability Areas**

**High Probability Area**

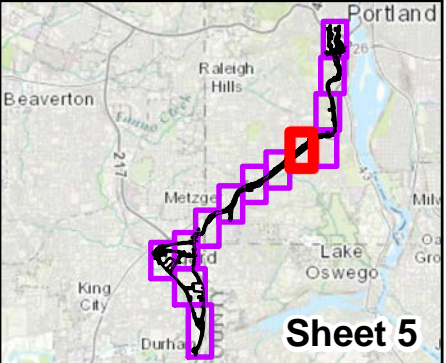
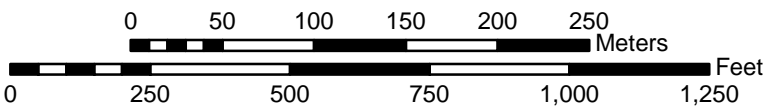
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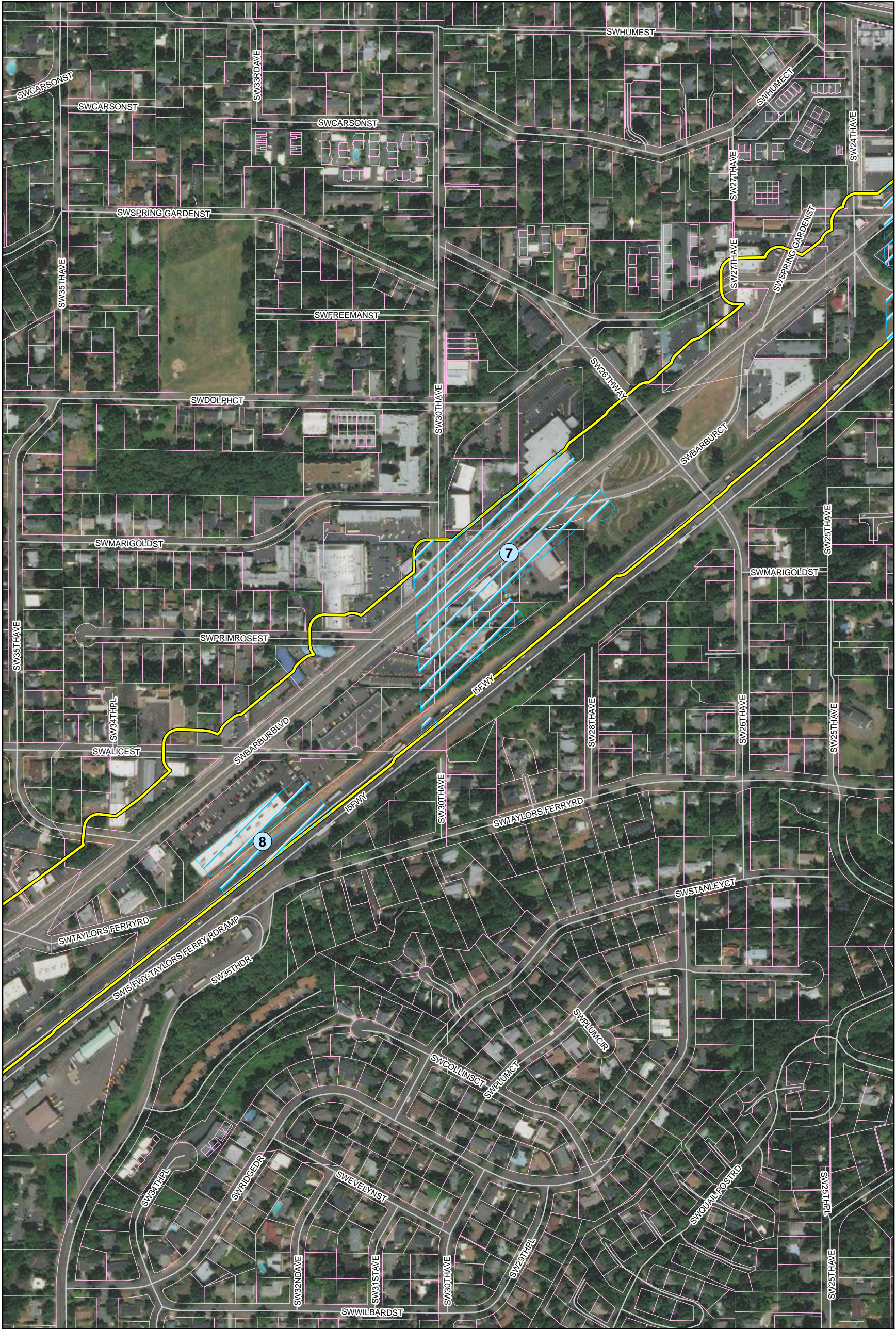
 Multicomponent HPA

 APE

 Taxlots









**Legend: Appendix D - Archaeological High Probability Areas**

**High Probability Area**

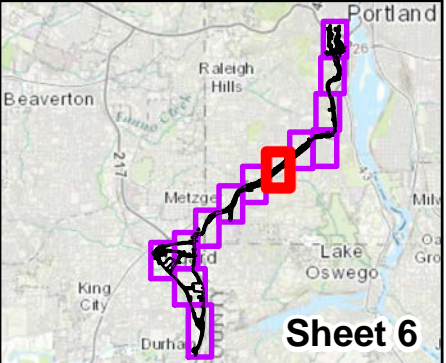
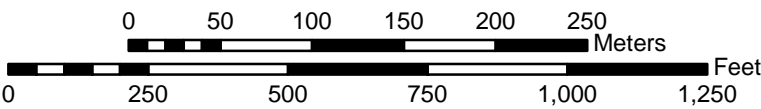
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 Historic-period HPA

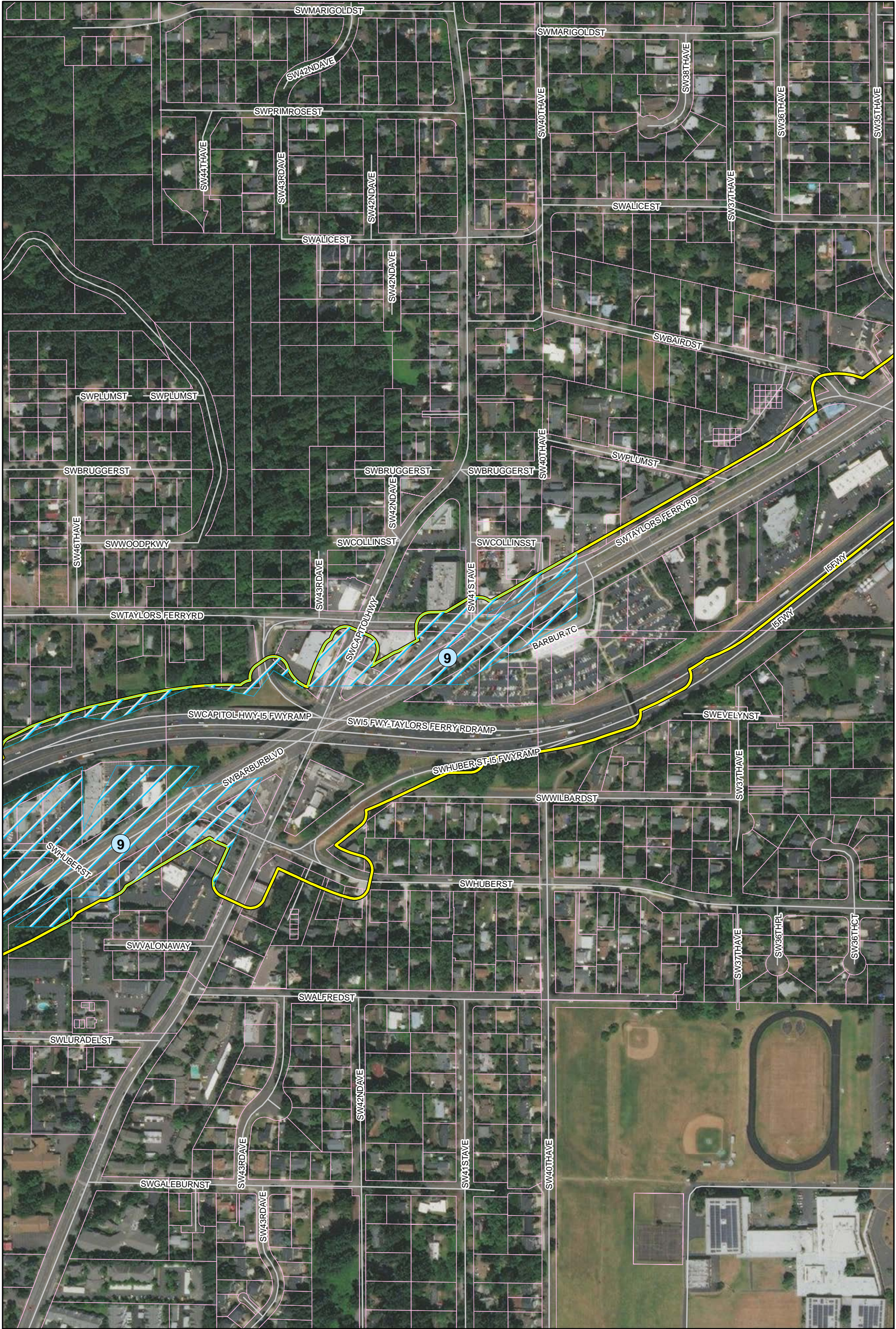
 Multicomponent HPA

 APE

 Taxlots









**Legend: Appendix D - Archaeological High Probability Areas**

**High Probability Area**

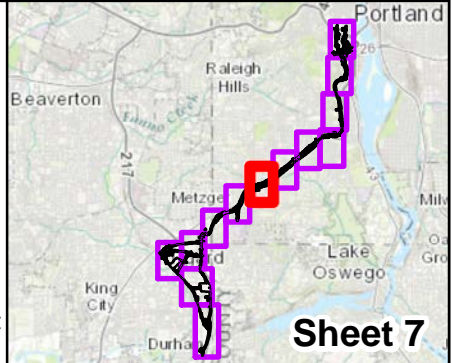
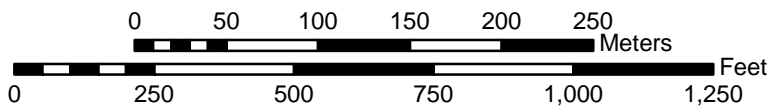
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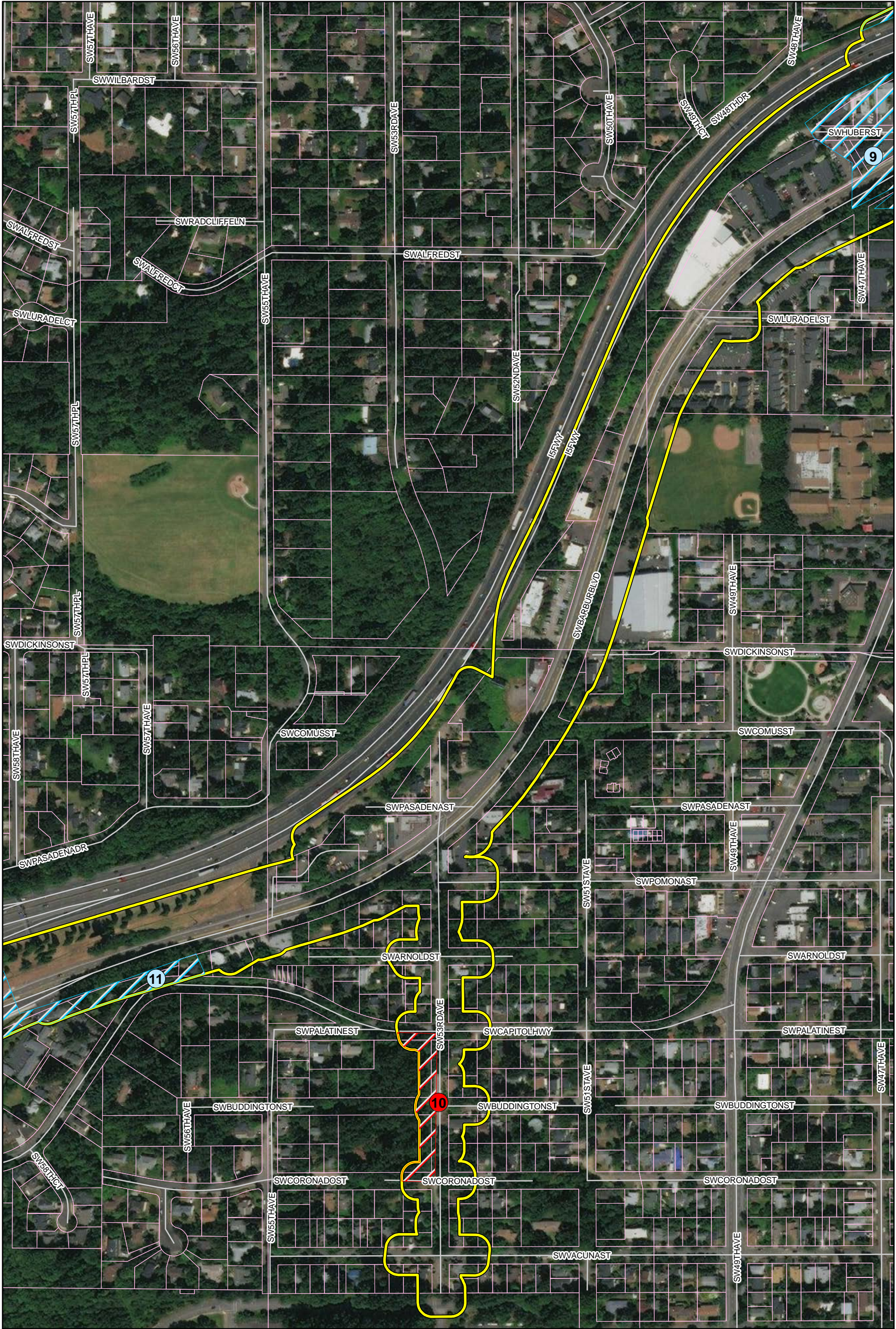
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 APE

 Taxlots





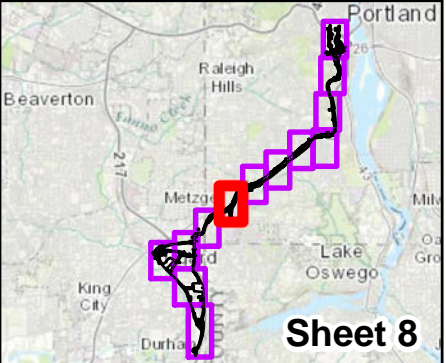
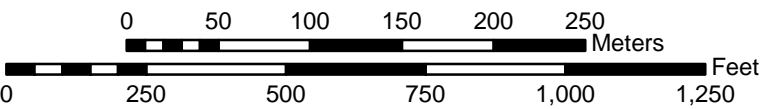


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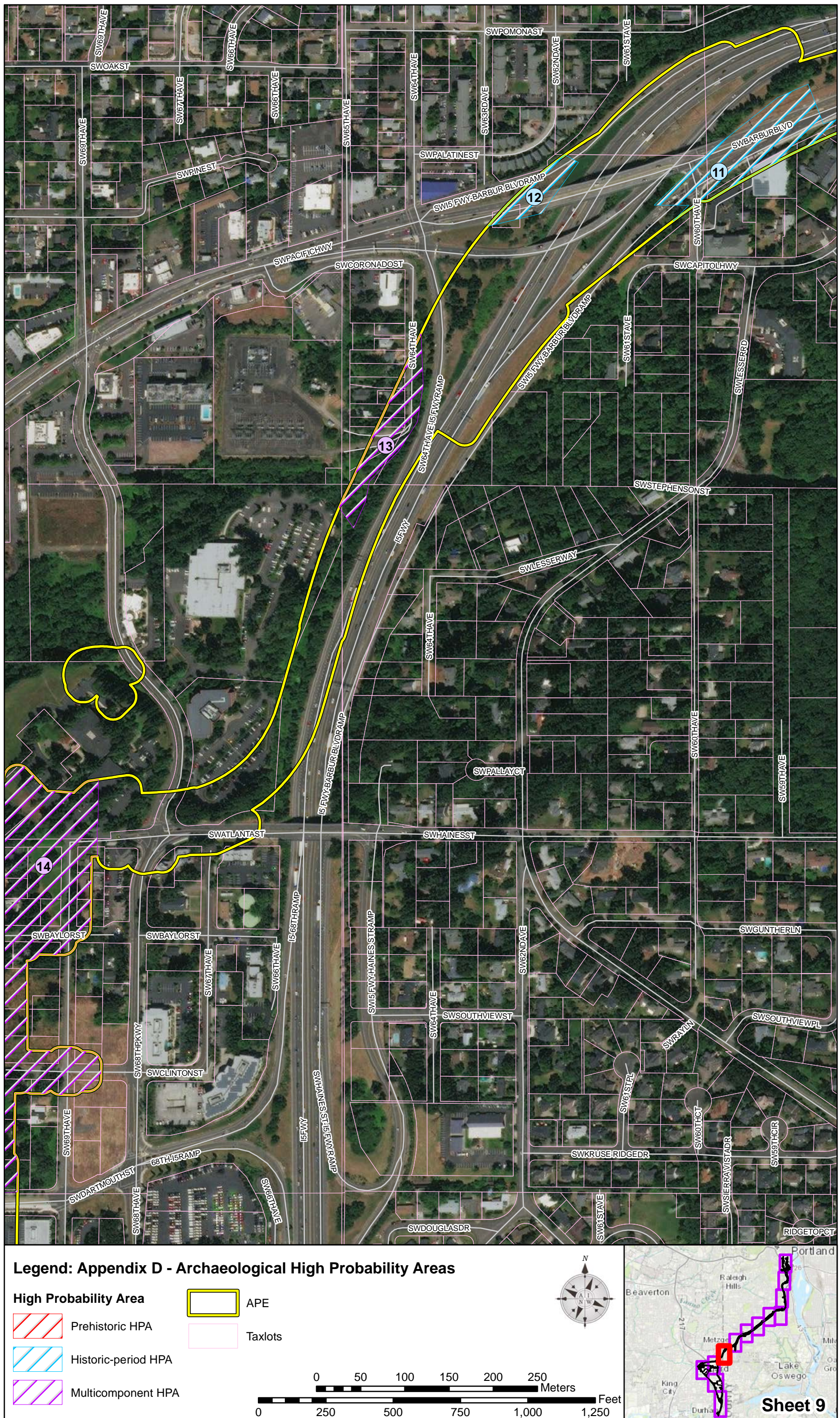
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  - Prehistoric HPA
  - Historic-period HPA
  - Multicomponent HPA
- APE

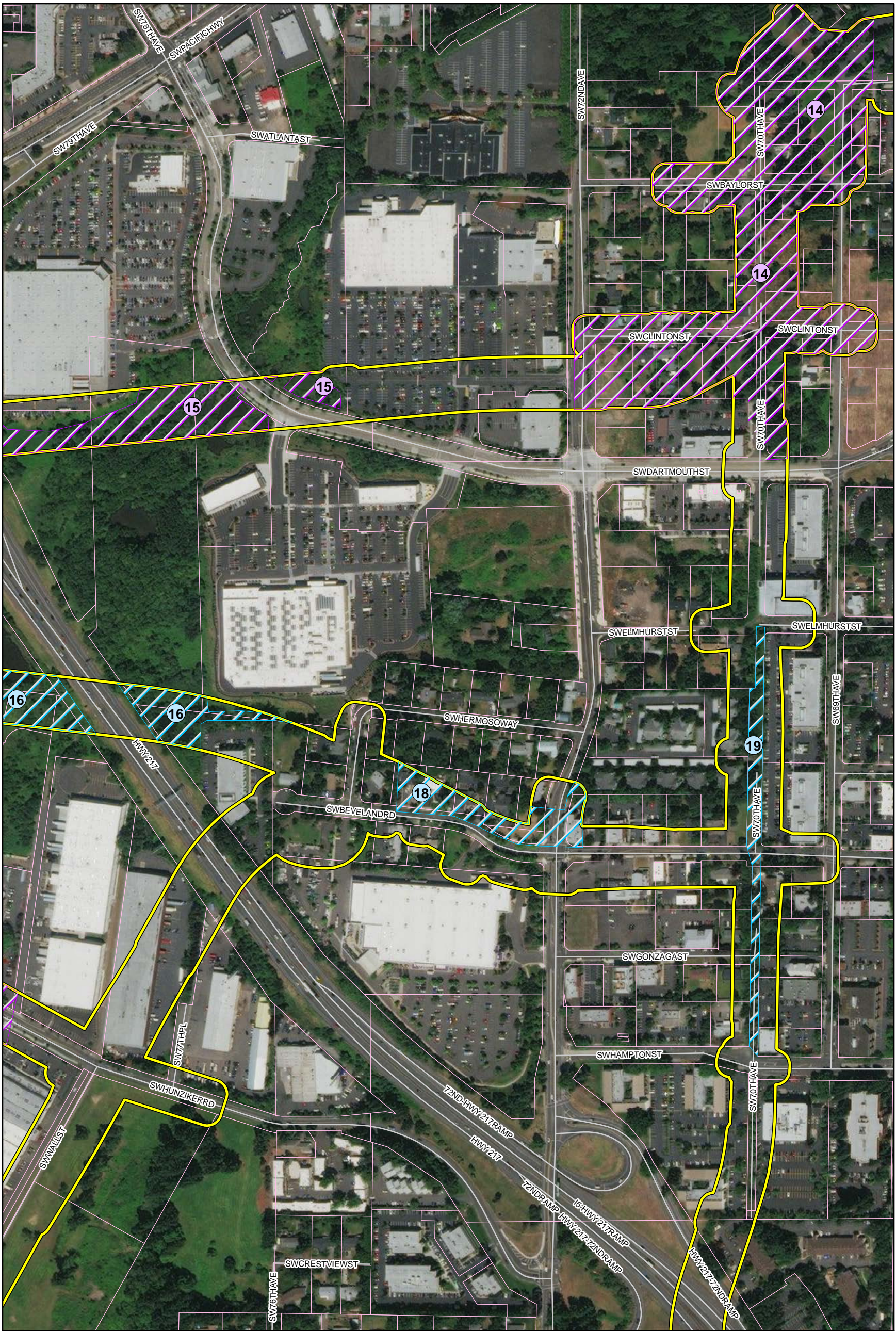
Taxlots









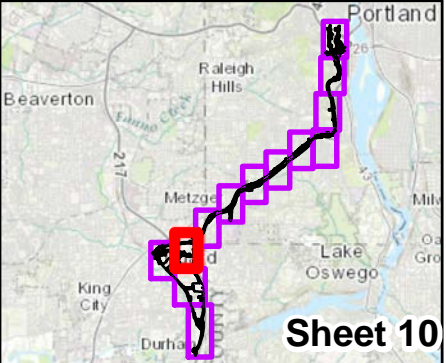
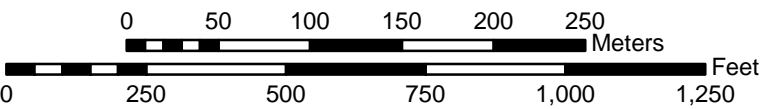


**Legend: Appendix D - Archaeological High Probability Areas**

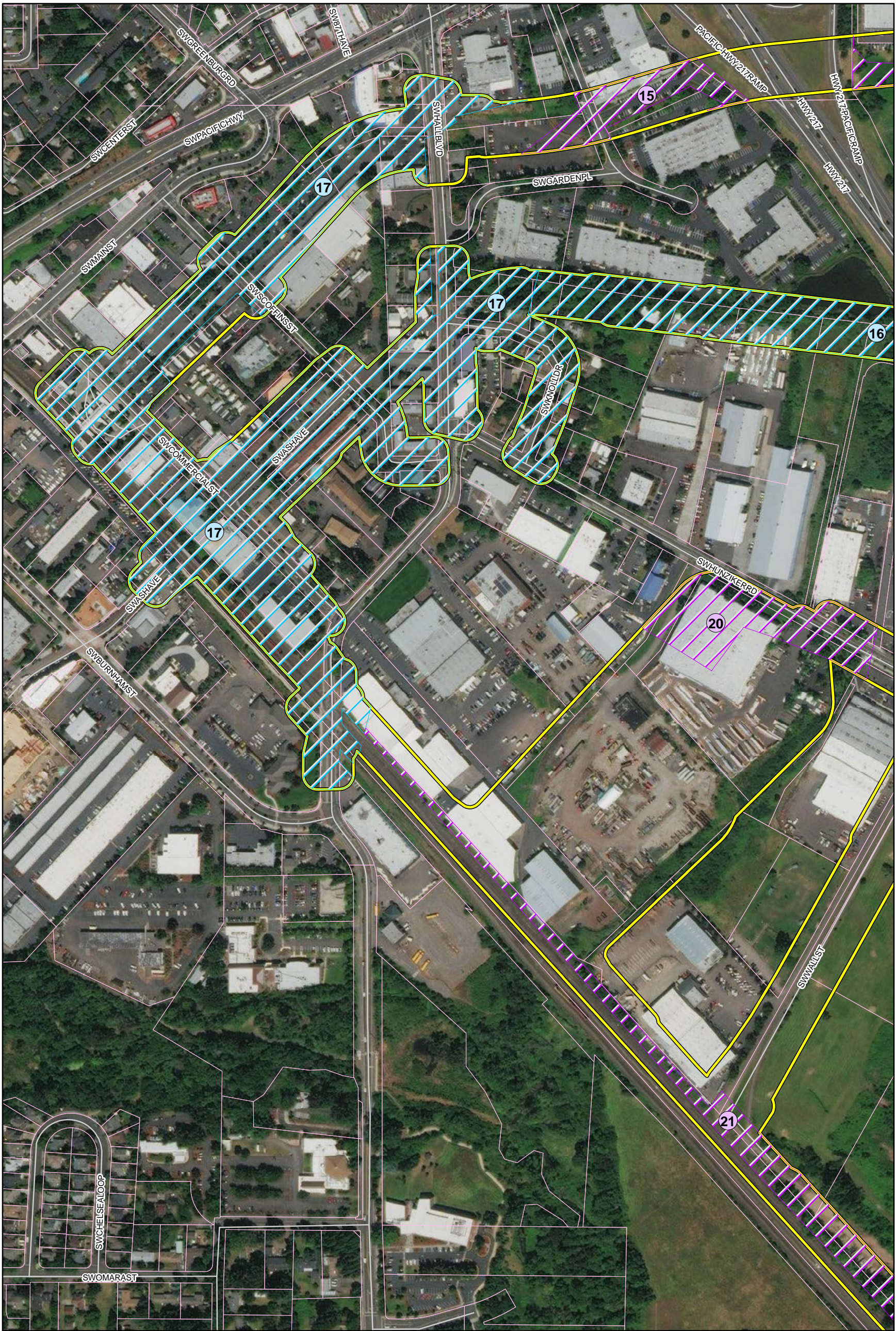
- High Probability Area**

  - Prehistoric HPA
  - Historic-period HPA
  - Multicomponent HPA
- APE

Taxlots









**Legend: Appendix D - Archaeological High Probability Areas**

**High Probability Area**

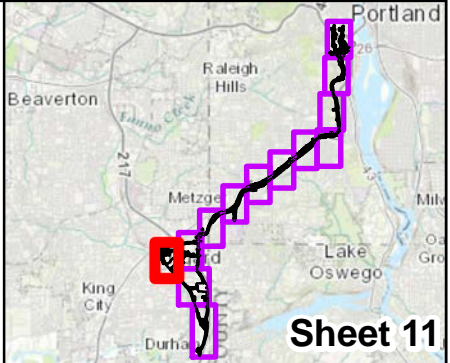
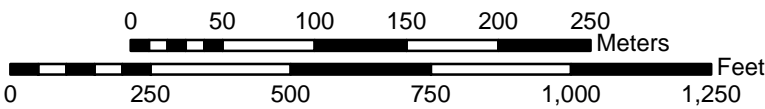
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 Historic-period HPA

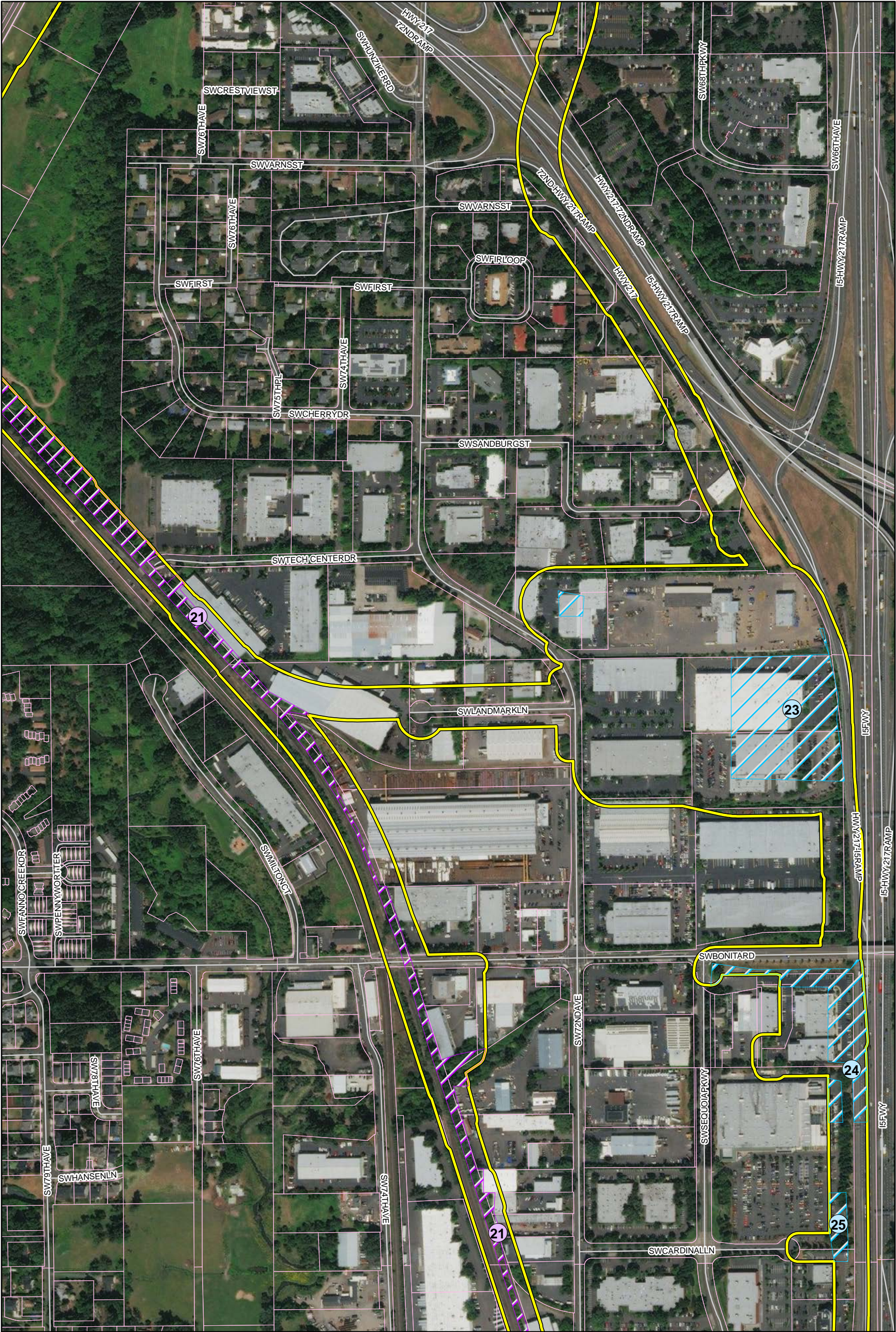
 Multicomponent HPA

 APE

 Taxlots








**Legend: Appendix D - Archaeological High Probability Areas**

**High Probability Area**

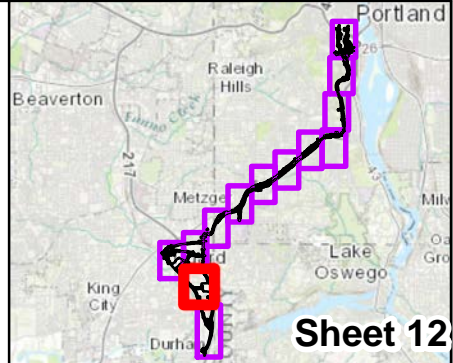
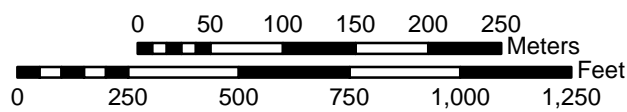
 Prehistoric HPA

 Historic-period HPA

 Multicomponent HPA

 APE

 Taxlots















## APPENDIX E

### TABLE OF ARCHAEOLOGICAL HIGH PROBABILITY AREAS (HPAs)

*The HPA numbers correlate with the Map ID numbers in Appendix B*









APPENDIX E  
ARCHAEOLOGICAL HIGH PROBABILITY AREAS

HPA # (Map ID)	Location	Anticipated Discoveries	Recommendations	HPA Photographs	
HPA-1 (Sheet 1)	SW 4 <sup>th</sup> Avenue north of I-405	<p>Buried prehistoric resources</p> <p>Historic-period resources: privies, cisterns, building foundations, sheet trash, dumps, remnant/buried infrastructure (roads, railroads, bridges, drainage features)</p>	Monitor	 <p>South along SW 4th Avenue at SW Lincoln Street</p>	 <p>West along SW Lincoln Street at SW 4th Avenue</p>
HPA-2 (Sheet 1)	SW Naito Parkway north of I-405	<p>Historic-period resources: privies, cisterns, building foundations, sheet trash, dumps, remnant/buried infrastructure</p>	<p>Subsurface trenching or testing; pedestrian survey is complete (Survey Area 1)</p> <p>Monitor</p>	 <p>South along SW Naito Parkway at SW Lincoln Street</p>	 <p>North along SW Naito Parkway at SW Lincoln Street</p>
HPA-3 (Sheets 1 and 2)	SW Barbur Boulevard and SW Naito Parkway between I-405 and SW Hamilton Street	<p>Buried prehistoric resources</p> <p>Historic-period resources: privies, cisterns, building foundations, sheet trash, dumps, remnant/buried infrastructure</p> <p><i>(Three newly found resources)</i></p>	<p>Pedestrian survey and shovel testing (Survey Areas 4 through 7)</p> <p>Delineate and research resources</p> <p>Monitor</p>	 <p>North-northwest along SW Barbur Boulevard at SW Bancroft Street</p>	 <p>West from SW Terwilliger Blvd at OHSU</p>








APPENDIX E, continued

HPA # (Map ID)	Location	Anticipated Discoveries	Recommendations	HPA Photographs	
HPA-4 (Sheets 2 and 3)	SW Barbur Boulevard between SW Slavin Road and SW Texas Street	Buried prehistoric resources  Historic-period resources: privies, cisterns, building foundations, sheet trash, dumps, remnant/buried infrastructure  <i>(Two newly found resources)</i>	Pedestrian survey and shovel testing (Survey Areas 8 and 9)  Delineate and research resources  Monitor	 Wooded area along west side of SW Barbur Boulevard at north end of HPA-4	 South along SW Barbur Boulevard near SW Capitol Highway
HPA-5 (Sheets 3 and 4)	SW Barbur Boulevard between SW Texas Street and SW Bertha Boulevard	Historic-period resources: privies, cisterns, building foundations, sheet trash, dumps, remnant/buried infrastructure	Monitor	 West along SW Barbur Boulevard at SW 4 <sup>th</sup> Avenue	 East along SW Barbur Boulevard at SW Terwilliger Boulevard
HPA-6 (Sheet 5)	SW Barbur Boulevard and I-5 between SW 17 <sup>th</sup> and SW 23 <sup>rd</sup> Avenues	Historic-period resources: privies, cisterns, building foundations, sheet trash, dumps, remnant/buried infrastructure	Monitor	 West-southwest along SW Barbur Boulevard at SW Capitol Hill Road	 North along SW 22 <sup>nd</sup> Avenue towards SW Barbur Boulevard








APPENDIX E, continued

HPA # (Map ID)	Location	Anticipated Discoveries	Recommendations	HPA Photographs	
HPA-7 (Sheet 6)	SW Barbur Boulevard and I-5 between SW 26 <sup>th</sup> Way and SW 30 <sup>th</sup> Avenue	Historic-period resources: privies, cisterns, building foundations, sheet trash, dumps, remnant/buried infrastructure	Monitor	 Southwest along SW Barbur Boulevard at SW 30 <sup>th</sup> Avenue	 Northeast along SW Barbur Boulevard at SW 30 <sup>th</sup> Avenue
HPA-8 (Sheet 6)	SW Barbur Boulevard and I-5 at SW Alice Street	Historic-period resources: privies, building foundations, refuse, remnant/buried infrastructure	Monitor	 Southwest at Capitol Plaza building and parking lot	
HPA-9 (Sheets 7 and 8)	SW Barbur Boulevard and I-5 between SW 40 <sup>th</sup> and SW 47 <sup>th</sup> Avenues	Historic-period resources: privies, cisterns, building foundations, sheet trash, dumps, remnant/buried infrastructure	Monitor	 West-southwest along SW Barbur Boulevard at SW Huber Street	 East-northeast along SW Barbur Boulevard at SW Huber Street

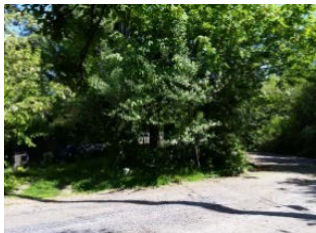
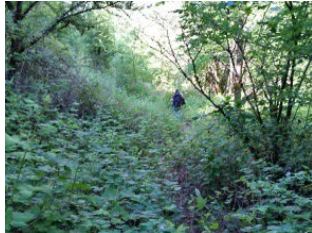






APPENDIX E, continued

HPA # (Map ID)	Location	Anticipated Discoveries	Recommendations	HPA Photographs	
HPA-10 (Sheet 8)	SW 53 <sup>rd</sup> Avenue between SW Coronado and SW Palatine Streets	Buried prehistoric resources	Shovel testing; pedestrian survey is complete (Survey Area 10)	 North along SW 53 <sup>rd</sup> Avenue at SW Buddington Street	 South within wooded area along SW 53 <sup>rd</sup> Avenue
HPA-11 (Sheets 8 and 9)	SW Barbur Boulevard between SW 60 <sup>th</sup> and SW 55 <sup>th</sup> Avenues	Historic-period resources: building foundations, refuse	Monitor	 Northeast from parking lot at SW 60 <sup>th</sup> Avenue and SW Barbur Boulevard	 North at SW 60 <sup>th</sup> Avenue and SW Barbur Boulevard
HPA-12 (Sheet 9)	SW Barbur Boulevard between SW 62 <sup>th</sup> and SW 63 <sup>rd</sup> Avenues	Historic-period resources: building foundations, refuse	Monitor	 West between SW Barbur Boulevard and I-5 near SW 60 <sup>th</sup> Avenue	









APPENDIX E, continued

HPA # (Map ID)	Location	Anticipated Discoveries	Recommendations	HPA Photographs	
HPA-13 (Sheet 9)	SW 64 <sup>th</sup> Avenue near I-5	Buried prehistoric resources  Historic-period resources: privies, cisterns, building foundations, sheet trash, dumps, remnant/buried infrastructure	Pedestrian survey and shovel testing (Survey Area 11)	 North-northeast along SW 64 <sup>th</sup> Avenue	 Southwest along I-5 ROW near SW 64 <sup>th</sup> Avenue
HPA-14 (Sheets 9 and 10)	Between SW Atlanta and SW Dartmouth Streets	Buried prehistoric resources  Historic-period resources: privies, cisterns, building foundations, sheet trash, dumps, remnant/buried infrastructure	Pedestrian survey and shovel testing (Survey Areas 12, 13, 14, 16, 17, 18, and 19)	 West along SW Clinton Street at SW 69 <sup>th</sup> Avenue	 West from SW Atlanta Street and SW 68 <sup>th</sup> Parkway
HPA-15 (Sheets 10 and 11)	Between Highway 217 and WinCo Foods parking lot	Buried prehistoric resources  Historic-period resources: privies, refuse	Pedestrian survey and shovel testing (Survey Area 20)	 South from Costco parking lot near Highway 217	 West from WinCo Foods parking lot near SW Dartmouth Street








APPENDIX E, continued

HPA # (Map ID)	Location	Anticipated Discoveries	Recommendations	HPA Photographs	
HPA-16 (Sheets 10 and 11)	Between the Park 217 Business Center on SW Hall Boulevard and the Walmart shopping center on SW Dartmouth Street	Buried prehistoric resources	Pedestrian survey and shovel testing (Survey Area 21)	 West southwest from path behind Walmart near Highway 217	 Southwest behind the Park 217 Business Center near Highway 217
HPA-17 (Sheet 11)	Downtown Tigard	Historic-period resources: privies, cisterns, building foundations, sheet trash, dumps, remnant/buried infrastructure	Pedestrian survey and shovel testing (Survey Area 22)  Monitor	 Northwest from SW Scoffins Street	 Southwest from SW Knoll Drive and SW Hall Boulevard
HPA-18 (Sheet 10)	SW Beveland Road between SW 72nd Avenue and SW Hermoso Way	Historic-period resources: privies, refuse, building foundations	Monitor	 North from SW Beveland Road and SW 72nd Avenue	 West from SW Beveland Road and SW 72nd Avenue







APPENDIX E, continued

HPA # (Map ID)	Location	Anticipated Discoveries	Recommendations	HPA Photographs	
HPA-19 (Sheet 10)	SW 70 <sup>th</sup> Avenue between SW Elmhurst Street and SW Hampton Street	Historic-period resources: refuse	Pedestrian survey and shovel testing (Survey Area 15)	 <p>North along SW 70<sup>th</sup> Avenue from SW Hampton Street</p>	 <p>South along SW 70<sup>th</sup> Avenue (ROW) from SW Bevlard Road</p>
HPA-20 (Sheet 11)	SW Hunziker Road at Red Rock Creek	Buried prehistoric resources  Historic-period resources: privies, cisterns, building foundations, refuse, remnant/buried infrastructure	Pedestrian survey and shovel testing (Survey Area 23)	 <p>Southeast along Red Rock Creek from SW Hunziker Road</p>	
HPA-21 (Sheets 11, 12, and 13)	Railroad ROW and adjacent undeveloped areas between SW Hall Boulevard and SW 72 <sup>nd</sup> Avenue	Buried prehistoric resources  Historic-period resources: building foundations, refuse, remnant/buried infrastructure	Pedestrian survey and shovel testing (Survey Area 22)	 <p>Southeast along railroad ROW from south end of SW Wall Street</p>	 <p>North-northwest along railroad ROW from SW Bonita Road</p>







APPENDIX E, continued

HPA # (Map ID)	Location	Anticipated Discoveries	Recommendations	HPA Photographs	
HPA-22 (Sheet 12)	SW 72 <sup>nd</sup> Avenue north of SW Landmark Lane	Historic-period resources: building foundation, refuse	Monitor	 Southeast at 14010 SW 72 <sup>nd</sup> Avenue	
HPA-23 (Sheet 12)	SW 72 <sup>nd</sup> Avenue adjacent to the Oregon Highway 217 / I-5 on-ramp	Historic-period resources: privy, refuse	Monitor	 North along parking lot at 14200 SW 72 <sup>nd</sup> Avenue	
HPA-24 (Sheet 12)	SW Bonita Road and I-5	Historic-period resources: building foundation, refuse, privy	Monitor	 South from SW Bonita Road along I-5 at 6650 SW Bonita Road	 North from parking lot at 6650 SW Bonita Road




APPENDIX E, continued

HPA # (Map ID)	Location	Anticipated Discoveries	Recommendations	HPA Photographs	
HPA-25 (Sheet 12)	I-5 and SW Cardinal Lane	Historic-period resources: building foundation, refuse	Monitor	 <p>South between I-5 and parking lot at east end of Cardinal Lane</p>	
HPA-26 (Sheet 13)	Railroad ROW between SW 72 <sup>nd</sup> Avenue and I-5 including adjacent areas along SW Sequoia Way and SW Upper Boones Ferry Road	Historic-period resources: building foundation, refuse, privy, remnant/buried infrastructure	Pedestrian survey and shovel testing (Survey Area 22)  Monitor	 <p>Southeast along railroad ROW from SW Upper Boones Ferry Road</p>	 <p>South at railroad ROW from Business Park along SW Upper Boones Ferry Road</p>
HPA-27 (Sheet 13)	Between the west side of I-5 and the east side of a commercial park on SW 72 <sup>nd</sup> Avenue	Historic-period resources: building foundation, refuse	Monitor	 <p>North along I-5 near Carman Drive ramp</p>	



APPENDIX E, continued

HPA # (Map ID)	Location	Anticipated Discoveries	Recommendations	HPA Photographs	
HPA-28 (Sheet 13)	NE corner of SW 72 <sup>nd</sup> Avenue and SW Lower Boones Ferry Road	Historic-period resources: building foundation, refuse	Monitor	 <p>Northeast at Park and Ride near SW 72<sup>nd</sup> Avenue and SW Lower Boones Ferry Road</p>	



## **APPENDIX F**

### **LIGHT RAIL PROJECT ALTERNATIVES FOR ENVIRONMENTAL REVIEW**

*Presentation of Components of Segments, Alternatives, and Options*



## 2. ALTERNATIVES CONSIDERED

The Southwest Corridor Light Rail Project Draft Environmental Impact Statement (EIS) considers the following alternatives:

- The **No-Build Alternative** represents future conditions without the proposed light rail project.
- The **light rail alternatives** represent the Southwest Corridor Light Rail Project, which is a proposed extension of light rail connecting downtown Portland, Oregon, to southwest Portland, downtown Tigard and Tualatin.

Section	Page
2.1 Alternatives Development .....	2-2
2.2 No-Build Alternative.....	2-6
2.3 Light Rail Alternatives.....	2-6
2.4 Minimum Operable Segment (MOS) .....	2-28
2.5 Potential Design Refinements and Options .....	2-29
2.6 Initial Route Proposal .....	2-30

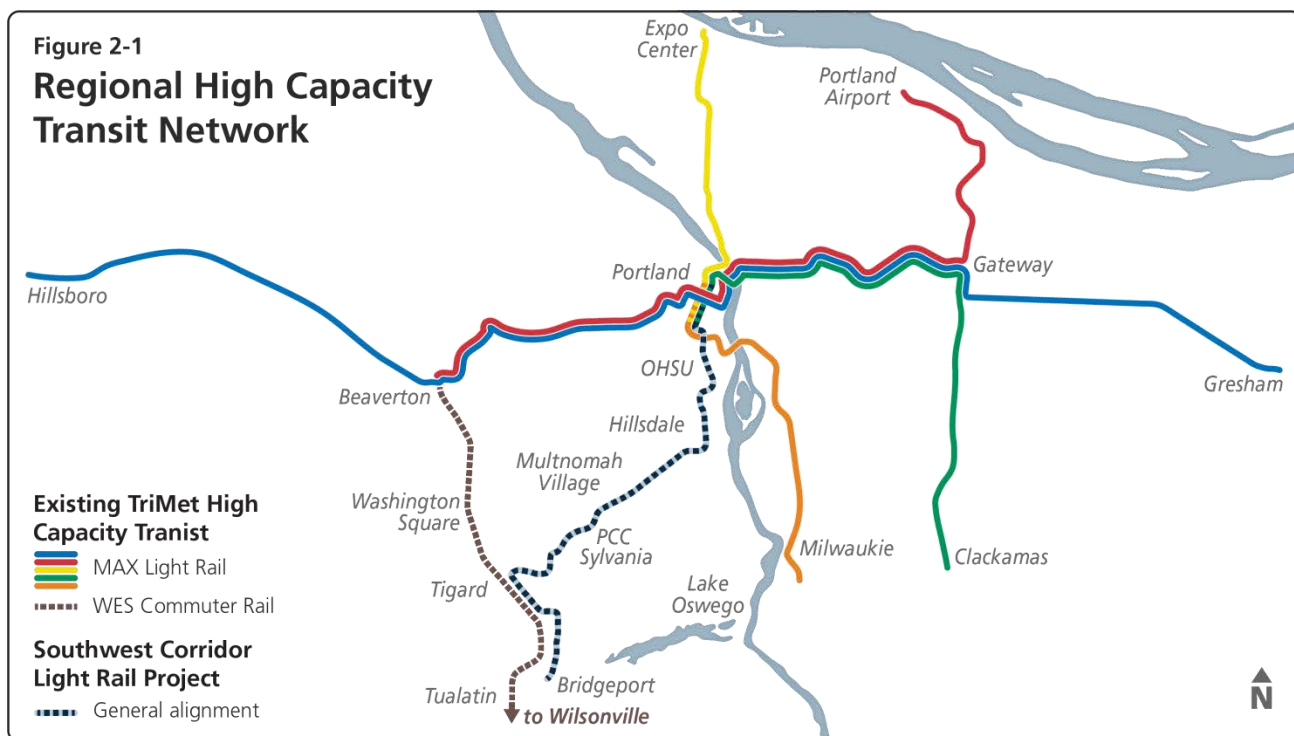
Table 2-1 provides an overview of the elements of the light rail project. Figure 2-1 illustrates how the light rail line would relate to the existing regional high capacity transit network.

**Table 2-1. Light Rail Project Overview**

Light Rail Project Elements
<ul style="list-style-type: none"> <li>• <b>Light rail trackway:</b> a 12-mile light rail line between downtown Portland and Tualatin via Tigard, which would primarily run at grade, but may include up to 2.6 miles of elevated trackway or bridges and up to four cut-and-cover undercrossings</li> <li>• <b>Stations and park and rides:</b> up to 13 light rail stations with platforms up to 200 feet long, including up to 7 park and rides with up to 4,200 spaces total, two reconfigured transit centers and tail tracks or third tracks at terminus stations</li> <li>• <b>Light rail vehicles:</b> up to 32 light rail vehicles added to the TriMet fleet that would operate in two-car trains sets (16 sets)</li> <li>• <b>Light rail service:</b> service frequencies ranging from 7 to 15 minutes in 2035, depending on location along alignment and time of day</li> <li>• <b>Bus routing changes:</b> elimination or modification of bus routes to improve coverage and service levels and avoid duplicating light rail service (service hours reallocated to other bus routes in the corridor)</li> <li>• <b>Marquam Hill connection:</b> structures making a new pedestrian connection between SW Barbur Blvd. and OHSU on Marquam Hill</li> <li>• <b>Shared transitway:</b> up to 2 miles of paved light rail transitway in South Portland to allow express use by buses to and from downtown</li> <li>• <b>PCC-Sylvania shuttle:</b> shuttle route connecting the PCC-Sylvania campus with up to two nearby light rail stations, including either five additional 40-foot buses or three van-sized shuttle buses</li> <li>• <b>O&amp;M facility:</b> new light rail O&amp;M facility in Tigard to accommodate up to 42 light rail vehicles (The Hunziker option would have space to add more storage tracks later for up to 60 vehicles total)</li> <li>• <b>Roadway modifications:</b> modifications to roadways along or intersecting the light rail alignment, such as SW Barbur Blvd., including addition or reconstruction of bicycle lanes and sidewalks along modified roadways</li> <li>• <b>Station access improvements:</b> new walking and bicycling infrastructure, such as sidewalks, bicycle lanes and paths, to improve access to stations</li> <li>• <b>Bridgehead Reconfiguration:</b> modifications to the roads and ramps accessing the west end of the Ross Island Bridge and addition of signalized intersections along SW Naito Pkwy. (included with a certain alignment alternative)</li> </ul>

Note: O&M = operations and maintenance; OHSU = Oregon Health & Science University; PCC = Portland Community College; TriMet = Tri-County Metropolitan Transportation District of Oregon.





This chapter describes the alternatives considered in this Draft EIS and summarizes the planning process that led to these alternatives. This chapter also describes options for constructing a standalone first phase of the light rail project, known as a minimum operable segment (MOS), several design refinements that have been developed to avoid or minimize the impacts of the alternatives studied, and an initial route proposal for the light rail line.

## 2.1. Alternatives Development

In 2009, Metro adopted the 30-year *High Capacity Transit System Plan* (Metro, 2009), also known as the HCT Plan, to guide investments in light rail, commuter rail, bus rapid transit and rapid streetcar in the Portland region. The HCT Plan identified the Southwest Corridor, the area between downtown Portland and Sherwood including Tigard and Tualatin, as a high priority.

Between 2011 and 2016, Metro and its local agency partners<sup>1</sup> developed the Southwest Corridor Plan to identify a high capacity transit project and other investment strategies to help improve safety and quality of life, and to support regional and local land use plans and economic development. This plan provided the framework for the Purpose and Need (Chapter 1) and the alternatives now being considered in this Draft EIS.

### Alternatives and Concepts Previously Considered

In September 2011, the Federal Transit Administration (FTA) and Metro issued an early scoping notice, which is an optional step prior to starting a project's National Environmental Policy Act (NEPA) review process. The notice advised agencies, tribal governments and the public that Metro and its partners

<sup>1</sup> Tri-County Metropolitan Transportation District of Oregon (TriMet); Oregon Department of Transportation (ODOT); the cities of Beaverton, Durham, King City, Portland, Sherwood, Tigard and Tualatin; and Washington County.



were exploring alternatives for improving transit service between downtown Portland and Sherwood. There were six public meetings to receive comments and suggestions, followed by several years of open public study conducted under the supervision of the Southwest Corridor Steering Committee, which is made up of officials from the jurisdictions in the corridor.<sup>2</sup>

Appendix I – Project Background and Alternatives Considered has more information on the various planning, public involvement and environmental processes that occurred between 2009 and 2016. The report describes the modes and alignments evaluated, explains why they were carried forward or eliminated, and has links to the more detailed documents and information the steering committee reviewed before deciding to advance or remove a given alternative. The primary alternatives that were considered, along with the reasons for their removal if they did not advance, are summarized below.

### ***Transit Modes Considered***

The following modes were considered during the development of the Southwest Corridor Plan before the steering committee selected light rail as the preferred mode:

- **Streetcar** was eliminated because it had a limited ability to serve the Southwest Corridor’s projected travel demand compared to light rail or bus rapid transit, and it would be slower and less efficient than the other two modes.
- **Interstate 5 (I-5) express lanes**, which dedicated a freeway lane for high occupancy vehicles, tolled vehicles and bus rapid transit, were eliminated because they did not meet the land use goals of the corridor, and they would have poor access to the community centers to be served.
- **Commuter rail**, which involved improvements to the Westside Express Service (WES) Commuter Rail, was eliminated because it did not directly serve the full Southwest Corridor and did not support the land use goals of the corridor, as called for in the project’s Purpose and Need.
- **Bus rapid transit alternatives**, which included several types of system concepts such as exclusive lanes, mixed traffic and multi-line systems feeding to a hub, were eliminated in several stages. Initially, mixed traffic and multi-line systems were eliminated because they were less efficient and less reliable than bus rapid transit or light rail operating mostly in dedicated transitways. Bus rapid transit as a mode was ultimately eliminated in 2016, before the start of this Draft EIS, because it lacked the long-term capacity to meet the corridor’s projected demand, it had higher long-term operating costs than light rail, and it created regional transit impacts because of the volume of buses it would introduce into downtown Portland. It also had lower agency and public support than light rail.

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<sup>2</sup> The Steering Committee is made up of elected officials from seven cities (Portland, Tigard, Tualatin, Sherwood, Beaverton, King City and Durham), Washington County, and Metro, and top leaders from TriMet and ODOT.



## ***Alignments and Destinations Considered***

Before the project partners and the steering committee arrived at the range of alternatives now being considered in this Draft EIS, a wide array of alignments and terminus concepts for light rail were considered (see Figure 2.1-1). Alignments that were considered and removed include:

- tunnel alignments to the medical and educational facilities on Marquam Hill, including Oregon Health & Science University (OHSU)
- tunnel alignments to the neighborhoods of Hillsdale and Multnomah Village
- tunnel alignments to the Portland Community College (PCC) Sylvania campus
- light rail extending to downtown Tualatin and Sherwood
- light rail on Pacific Highway (99W) in Tigard

These concepts were removed because they increased travel times, they had higher costs but did not gain ridership compared to the other alternatives available, they had higher engineering or technical risks, or they carried higher environmental or transportation impacts.

Although light rail tunnels with underground stations serving the educational institutions were removed from consideration, the project partners found other solutions that could improve access to OHSU and PCC-Sylvania. The light rail alternatives in this Draft EIS feature several options that connect these destinations to light rail at a lower cost and with fewer impacts.

## **Initiating the EIS**

A scoping comment period for the Southwest Corridor Light Rail Project was held from September 2, 2016, to October 3, 2016, as part of the project's NEPA review process. During the scoping comment period, the project partners and FTA invited broad participation from agencies and the public to review the proposed project. A variety of outreach efforts was used to engage stakeholders and to encourage the involvement of residents and businesses in the Southwest Corridor:

- two public online surveys available September 2 to October 3, 2016
- five neighborhood association meetings on September 7, 8, 12, 19 and 28, 2016
- agency and tribal scoping meeting on September 20, 2016
- public scoping meeting on September 22, 2016

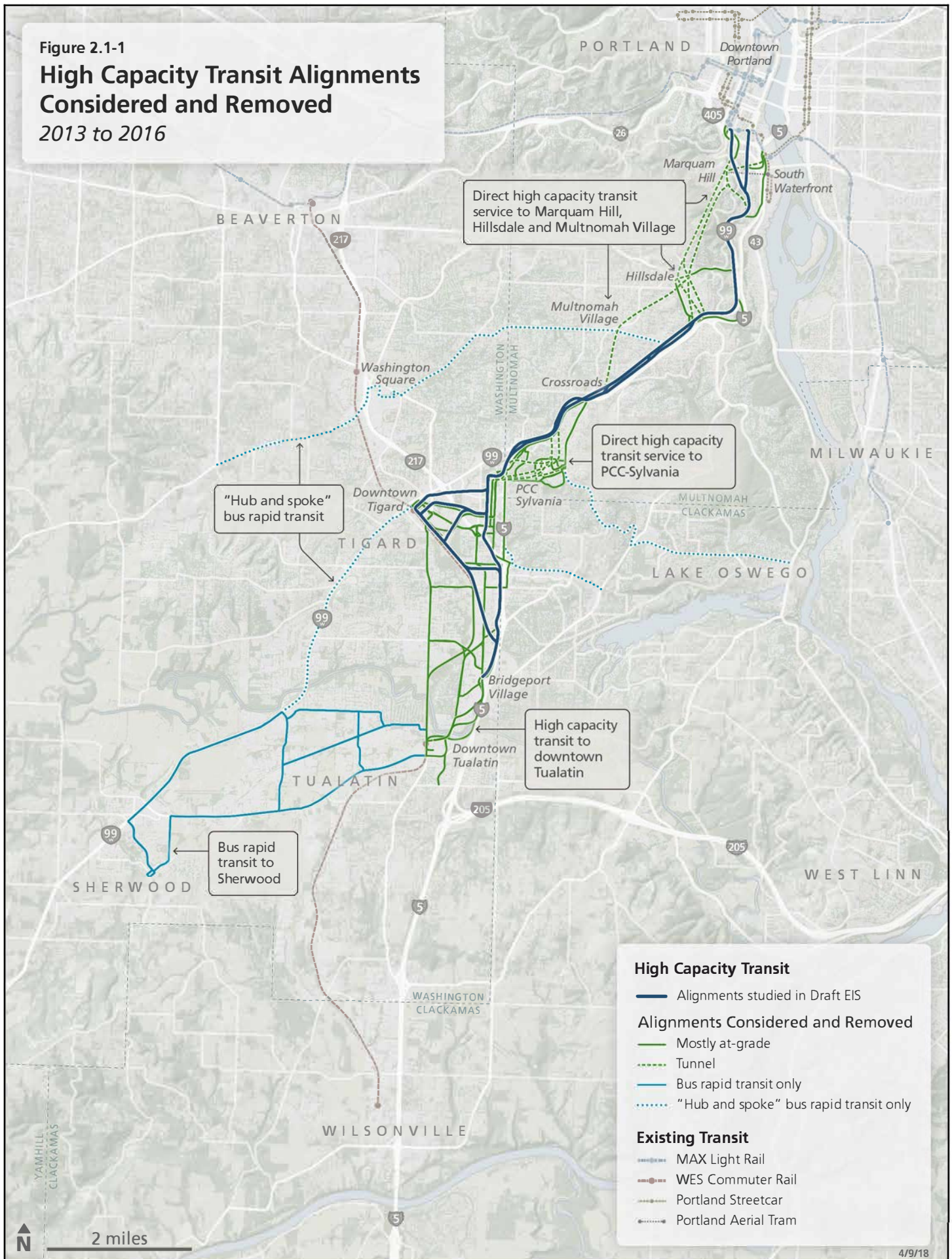
During the scoping comment period, the project received 1,620 comments, including surveys and emails from the general public and letters from agencies and organizations. A majority of comments from the public indicated support for the project as proposed. More than 70 percent of the comments received supported the draft Purpose and Need, the proposed alignments, and the stations, park and rides, and operations and maintenance (O&M) facility locations that are part of the project. Some comments expressed opposition to the project, and some suggested expanding the alternatives or options to be studied. Many of those suggestions had been studied in previous phases of the project, and others were incorporated into the light rail alternatives that are evaluated in this Draft EIS.

Metro's *Southwest Corridor Scoping Summary Report* describes the process and outcomes of the scoping comment period in more detail.



Figure 2.1-1

# High Capacity Transit Alignments Considered and Removed 2013 to 2016





## 2.2. No-Build Alternative

The No-Build Alternative is the baseline for evaluating the benefits and impacts of the light rail alternatives. The No-Build Alternative represents transportation and environmental conditions without light rail connecting Portland, Tigard and Tualatin, and without the roadway, bicycle and pedestrian improvements associated with the proposed light rail line. It assumes the regionally adopted forecast for population and employment growth through the year 2035 (Metro Council Resolution 13-4428; see Appendix 1.3 of the *Regional Transportation Plan* [Metro, 2014]).

The No-Build Alternative includes planned projects that are identified in the financially constrained project list of the *Regional Transportation Plan*, the currently adopted transportation system plan for the greater Portland region. The anticipated regional transit network for 2035, consistent with the *Regional Transportation Plan* and the *Southwest Service Enhancement Plan* (TriMet, 2015), is described in Appendix A – Detailed Maps and Descriptions of Light Rail Alternatives.

## 2.3. Light Rail Alternatives

The project would extend the existing Metropolitan Area Express (MAX) light rail network with a new 12-mile light rail line serving southwest Portland, Tigard and Tualatin (see Figure 2-1). The alignment would generally be either center-running within existing or new streets, or adjacent to roadways or railroads, and would serve up to 13 new stations with up to 4,200 park and ride spaces. The project would construct a new light rail O&M facility in Tigard. To address topographical challenges, connectivity barriers, and limited existing walking and biking infrastructure, the project also considers accompanying investments to improve access along and to the light rail line.

The light rail alternatives assume the same regionally adopted forecast for future population and employment growth as the No-Build Alternative. They also have the same planned projects from the financially constrained project list of the *Regional Transportation Plan*. The 2035 transit network used for transportation forecast models for the light rail alternatives is similar to what is used for modeling the No-Build Alternative, with select modifications to bus service in the corridor to complement the added light rail service. The bus network changes are described in more detail in Appendix A.

### Project Terminology

The project area is divided geographically into three **segments**:

- Segment A: Inner Portland
- Segment B: Outer Portland
- Segment C: Tigard and Tualatin

Each segment includes several **alignment alternatives**, which represent different locations for the light rail trackway, stations and possibly park and rides. The alignment alternatives also include some associated infrastructure changes, such as building missing sidewalks and bicycle lanes where the alignment is center-running in a roadway. The full-corridor project would include one alignment alternative from each segment.

In Segment C, the alignment alternatives use one of two different **route configurations**, which represent the choice between building a single light rail line, known as the Through Route, or two lines



that overlap for most of the route but diverge to terminate at different locations, known as the Branched Route.

Each segment includes additional project elements that are analyzed separately from the alignment alternatives in order to isolate their impacts, although they would also be integral to a complete light rail project. Segment A includes the **Marquam Hill connection**; Segment B includes the **PCC-Sylvania shuttle**; Segment C includes an **O&M facility**; and all three segments include **station access improvements**.

Table 2.3-1 lists the alignment alternatives and additional project elements by segment. Figure 2.3-1 shows a map of the light rail alternatives. Figure 2.3-2 provides a diagram of the alignment alternatives by geographic segment.

**Table 2.3-1. Light Rail Alternatives by Segment**

<b>Alignment Alternatives</b>	<b>Additional Project Elements</b> <i>(pair with all alignment alternatives unless otherwise noted)</i>
<b>Segment A: Inner Portland</b>	
<ul style="list-style-type: none"> <li>· Alternative A1: Barbur</li> <li>· Alternative A2-BH: Naito with Bridgehead Reconfiguration</li> <li>· Alternative A2-LA: Naito with Limited Access</li> </ul>	<p><b>Marquam Hill Connection</b></p> <ul style="list-style-type: none"> <li>· Connection 1A: Elevator/Bridge and Path</li> <li>· Connection 1B: Elevator/Bridge and Recessed Path</li> <li>· Connection 1C: Elevator/Bridge and Tunnel</li> <li>· Connection 2: Full Tunnel</li> </ul> <p><b>Station Access Improvements</b></p> <ul style="list-style-type: none"> <li>· SA01 through SA03 (see Appendix A for detailed information)</li> </ul>
<b>Segment B: Outer Portland</b>	
<ul style="list-style-type: none"> <li>· Alternative B1: Barbur</li> <li>· Alternative B2: I-5 Barbur TC to 60th</li> <li>· Alternative B3: I-5 26th to 60th</li> <li>· Alternative B4: I-5 Custer to 60th</li> </ul>	<p><b>PCC-Sylvania Shuttle</b></p> <ul style="list-style-type: none"> <li>· Barbur TC and Baylor Shuttle</li> <li>· 53rd Shuttle</li> </ul> <p><b>Station Access Improvements</b></p> <ul style="list-style-type: none"> <li>· SA04 through SA23 (see Appendix A for detailed information)</li> </ul>
<b>Segment C: Tigard and Tualatin</b>	
<p><b>Through Route</b></p> <ul style="list-style-type: none"> <li>· Alternative C1: Ash to I-5</li> <li>· Alternative C2: Ash to Railroad</li> <li>· Alternative C3: Clinton to I-5</li> <li>· Alternative C4: Clinton to Railroad</li> </ul> <p><b>Branched Route</b></p> <ul style="list-style-type: none"> <li>· Alternative C5: Ash and I-5 Branched</li> <li>· Alternative C6: Wall and I-5 Branched</li> </ul>	<p><b>Operations and Maintenance Facility</b></p> <ul style="list-style-type: none"> <li>· Hunziker Facility</li> <li>· Through 72nd Facility (pairs with Alternatives C1 and C3)</li> <li>· Branched 72nd Facility (pairs with Alternatives C5 and C6)</li> </ul> <p><b>Station Access Improvements</b></p> <ul style="list-style-type: none"> <li>· SA24 through SA29 (see Appendix A for detailed information)</li> </ul>

Note: PCC = Portland Community College; TC = Transit Center.



**Figure 2.3-1**  
**Light Rail Alternatives**

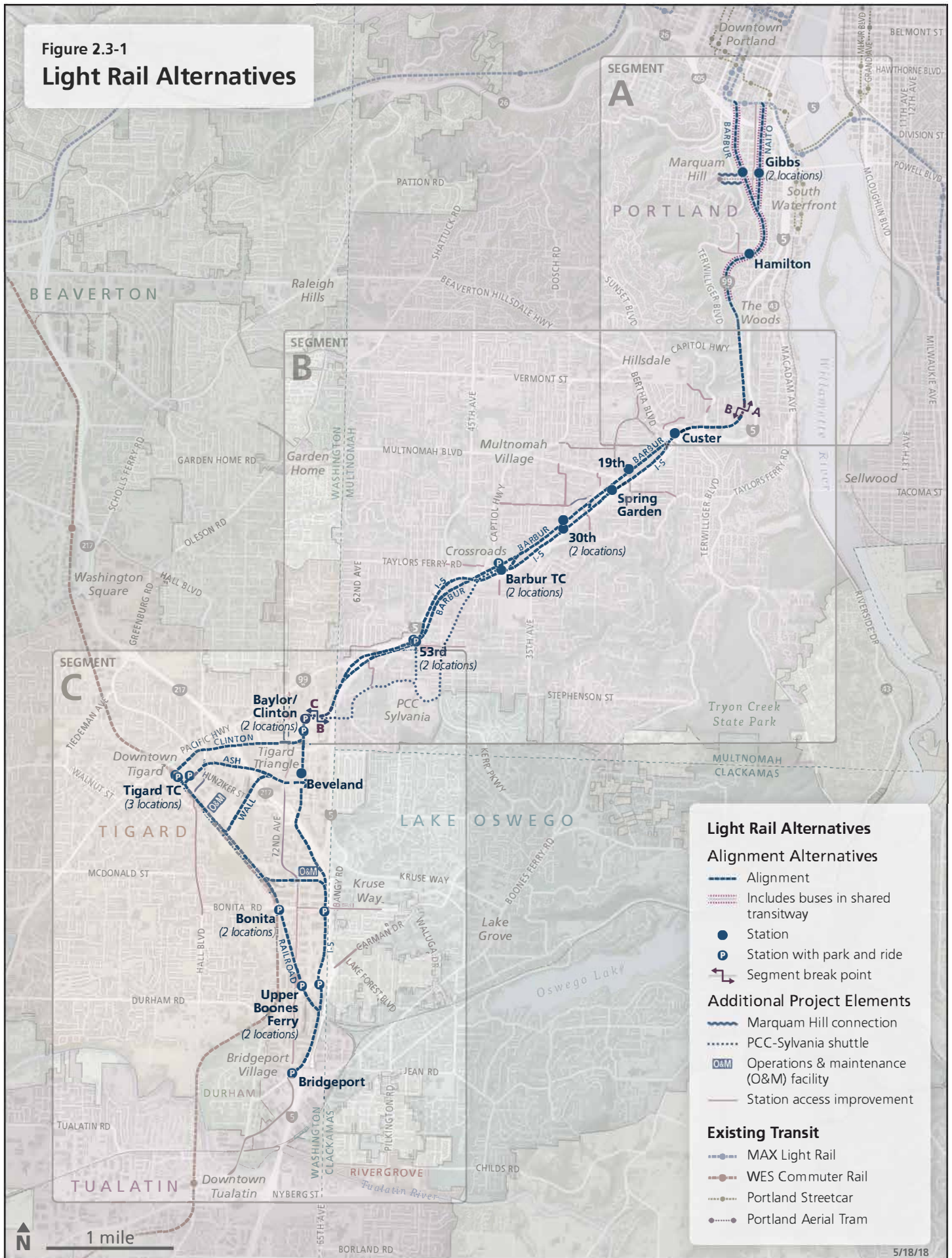


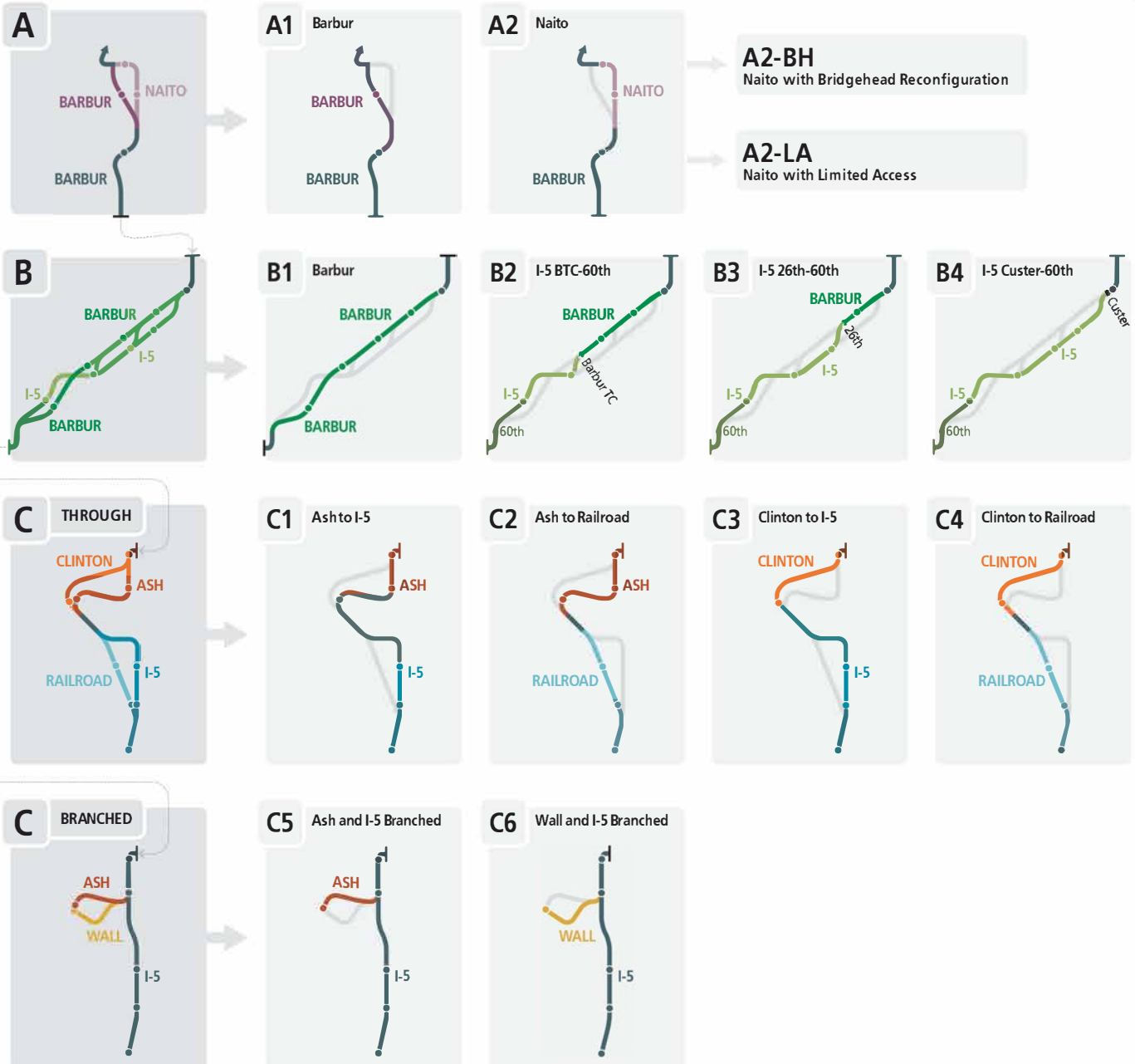


Figure 2.3-2

## Alignment Alternatives by Segment

### SEGMENTS & ROUTE CONFIGURATIONS

### ALIGNMENT ALTERNATIVES



#### NOTE

Alternatives A1, B2, C1 and C5 are assumed as a baseline when necessary for comparison.



## Overview of Light Rail Project Infrastructure

Table 2.3-2 summarizes the physical features that may be included in the light rail project. Table 2.3-3 describes features that would be included with specific station locations. Appendix A includes maps of the alignment alternatives, park and rides, Marquam Hill connection options, O&M facility options and station access improvement options, as well as examples of typical light rail station designs.

**Table 2.3-2. Overview of Light Rail Project Infrastructure**

Project Element	Potentially Included Infrastructure
Alignment <sup>1</sup>	<ul style="list-style-type: none"> <li>· light rail trackway, which may be at grade in exclusive right of way, on an aerial structure, on built-up fill, in a cut-and-cover undercrossing, or in retained cut or fill</li> <li>· tracks, which may be embedded, on ballast or directly fixed, and may include switches or turnouts</li> <li>· overhead wires and support poles</li> <li>· electrification stations and substations</li> <li>· train controls and signals, including signal management structures</li> <li>· traffic signals and crossing protection</li> <li>· new or rebuilt roadways and bridges, which may include widening of the roadway or modification of existing through lanes, turn lanes or parking</li> <li>· utilities and utility relocation</li> <li>· streetscape elements, which may include sidewalks, bicycle lanes, landscape buffers, bioswales, benches, lighting and signage</li> </ul>
Stations <sup>1</sup>	<ul style="list-style-type: none"> <li>· platforms up to 200 feet long, which may be located between the tracks in the roadway median, on both sides of the tracks in the roadway median, curbside or elevated</li> <li>· tail tracks or third tracks at terminus stations for operational flexibility</li> <li>· station amenities, including shelters, seating, lighting, signage, telephones, refuse cans and fare collection equipment</li> <li>· at-grade pedestrian crossings accessing one or both ends of each platform</li> <li>· surface or structured parking</li> <li>· bicycle parking</li> <li>· pedestrian bridges</li> </ul>
Marquam Hill connection	<ul style="list-style-type: none"> <li>· elevators, stairs and ramps</li> <li>· pedestrian bridges and pathways</li> <li>· cut-and-cover or bored tunnels/underpasses</li> </ul>
PCC-Sylvania shuttle	<ul style="list-style-type: none"> <li>· bus bays and related passenger facilities on PCC-Sylvania campus</li> <li>· shuttle equipment and storage</li> <li>· shuttle ramp accessing campus</li> </ul>
O&M facility	<ul style="list-style-type: none"> <li>· maintenance and wash bays</li> <li>· storage tracks</li> <li>· wheel truing equipment</li> <li>· vehicle wash</li> <li>· unit repair facility (for vehicle parts)</li> <li>· parts storage</li> <li>· surface parking for employees and fleet vehicles</li> <li>· administrative space</li> <li>· on-site stormwater management</li> </ul>
Station access improvements	<ul style="list-style-type: none"> <li>· sidewalks</li> <li>· shared in-street bikeways</li> <li>· bicycle lanes</li> <li>· protected crossings</li> <li>· pedestrian bridges</li> </ul>

Note: O&M = operations and maintenance; PCC = Portland Community College.

<sup>1</sup> The features of the alignment and stations are defined by each "alignment alternative."



**Table 2.3-3. Station Characteristics**

Station Name by General Location	Alignment Alternatives	Park and Ride <sup>1</sup>		Other Notable Characteristics
		Spaces	Levels	
Lair Hill				
Gibbs Barbur Station	A1	N/A	N/A	Center platform in roadway median
Gibbs Naito Station	A2-BH, A2-LA	N/A	N/A	Center platform in roadway median
Hamilton				
Hamilton Station	All Segment A	N/A	N/A	Center platform in roadway median
Burlingame				
Custer Station	All Segment B	N/A	N/A	Center platform in roadway median
Capitol Hill				
19th Station	B1, B2, B3	N/A	N/A	Side platforms in roadway median
Spring Garden Station	B4	N/A	N/A	Center platform away from roadway
26th/30th				
30th Barbur Station	B1, B2	N/A	N/A	Staggered side platform (far-side)
30th I-5 Station	B3, B4	N/A	N/A	Center platform away from roadway
Barbur TC				
Barbur TC Barbur Station	B1	825	3	Side platforms away from roadway TC reconfigured
Barbur TC I-5 Station	B2, B3, B4	725	3	Side platforms in roadway median TC reconfigured Pedestrian bridge over I-5 replaced
53rd				
53rd Barbur Station	B1	950	3	Center platform in roadway median Pedestrian bridge over SW Barbur Blvd. added
53rd I-5 Station	B2, B3, B4	950	3	Side platforms next to roadway Pedestrian bridge over SW Barbur Blvd. added
Northern Tigard Triangle				
Baylor Station	C1, C2, C5, C6	425	3	Center platform in side-running configuration
Clinton Station	C3, C4	425	3	Center platform in side-running configuration
Southern Tigard Triangle <sup>2</sup>				
Beveland Station	C1, C2, C5, C6	N/A	N/A	Center platform in side-running configuration
Tigard TC				
Tigard TC Ash Station	C1, C2, C5	300	3	Side platforms in side-running configuration TC moved to SW Ash Ave. For Alt. C5: tail track to Hunziker O&M facility
Tigard TC Clinton Station	C3, C4	275	3	Center platform away from roadway TC moved south on SW Commercial St.
Tigard TC Wall Station	C6	275	3	Platforms with three tracks away from roadway TC moved south on SW Commercial St.
Bonita				
Bonita I-5 Station	C1, C3, C5, C6	150	surface	Side platforms away from roadway 10- to 20-foot walls north and east of platforms
Bonita Railroad Station	C2, C4	100	surface	Center platform on elevated trackway
Upper Boones Ferry				
Upper Boones Ferry I-5 Station	C1, C3, C5, C6	600	3	Side platforms away from roadway 10- to 20-foot walls north and east of platforms
Upper Boones Ferry Railroad Station	C2, C4	50	surface	Center platform away from roadway
Bridgeport Village				
Bridgeport Station	All Segment C	950	4	Platforms with three tracks away from roadway Pedestrian bridge to P&R over SW LBF Rd.

Note: LBF = Lower Boones Ferry; N/A = not applicable; P&R = park and ride; TC = Transit Center.

<sup>1</sup> Based on the maximum proposed size for each park and ride. Subject to refinement during the Final EIS process.

<sup>2</sup> Alternatives C3 and C4 would not include a southern Tigard Triangle station.



## Segment A: Inner Portland

Segment A encompasses the area from the southern edge of downtown Portland to just north of the intersection of SW Barbur Boulevard and SW Brier Place (see Figure 2.3-1). All three alignment alternatives in Segment A would tie in to the Downtown Portland Transit Mall, which runs along SW 5th and 6th Avenues. The Transit Mall currently supports MAX Green, Yellow and Orange lines. The Southwest Corridor Light Rail Project would extend MAX Green Line service from its terminus at SW 5th Avenue and SW Jackson Street near Portland State University.

As described in the following sections, the alignment alternatives in Segment A include different approaches for the configuration of SW Naito Parkway and the roads and ramps that access the west end of the Ross Island Bridge. Alternative A2-LA would reconstruct SW Naito Parkway and the adjacent streets to generally maintain the existing limited-access roadway configuration. Alternative A2-BH would instead include changes to SW Naito Parkway and the bridge access, known collectively as the Bridgehead Reconfiguration (see Exhibit 2.3-1). The Bridgehead Reconfiguration is also an optional addition to Alternative A1 (see Section 2.5, Potential Design Refinements and Options).

### Exhibit 2.3-1

#### What is the Bridgehead Reconfiguration?

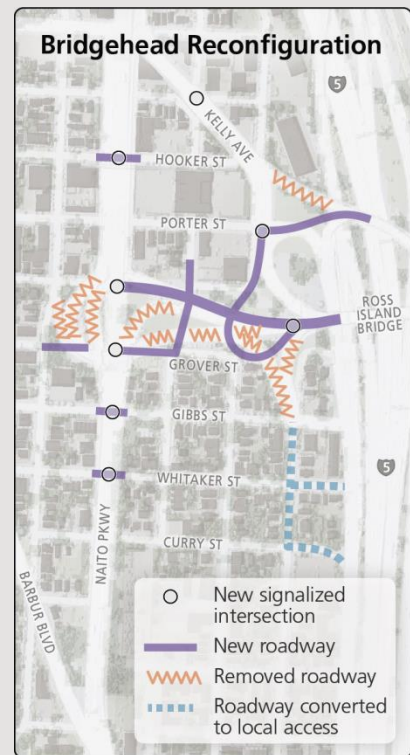
The “Bridgehead” refers to the area at the west end of the Ross Island Bridge in the South Portland neighborhood (see Figure 2.3-3 for context).

This area has been shaped and reshaped by infrastructure projects since the early 1900s. As the automobile became more popular and streets replaced streetcar lines, high-volume roadways such as SW Barbur Boulevard, I-5, SW Harbor Drive, SW Front Avenue (now SW Naito Parkway), freeway interchanges and Ross Island Bridge ramps displaced homes and businesses, and placed barriers to access in the remaining neighborhood.

Congested traffic conditions continue today with queues regularly spilling into the neighborhoods, impacting quality of life, and constraining walking and biking access. The Bridgehead Reconfiguration derives from nearly 40 years of plans for the area, and is intended to accomplish a range of land use and transportation goals of both the City of Portland and ODOT.

The Bridgehead Reconfiguration would redirect traffic from downtown Portland to Interstate 405, including eastbound U.S. 26 traffic, along SW Kelly Avenue to a new ramp on the Ross Island Bridge, and convert SW Naito Parkway to a surface boulevard with at-grade intersections. It would change other ramp accesses to the bridge, add bicycle lanes and open up nearly 3 acres of land for development.

The Bridgehead Reconfiguration is an integral part of Alternative A2-BH.

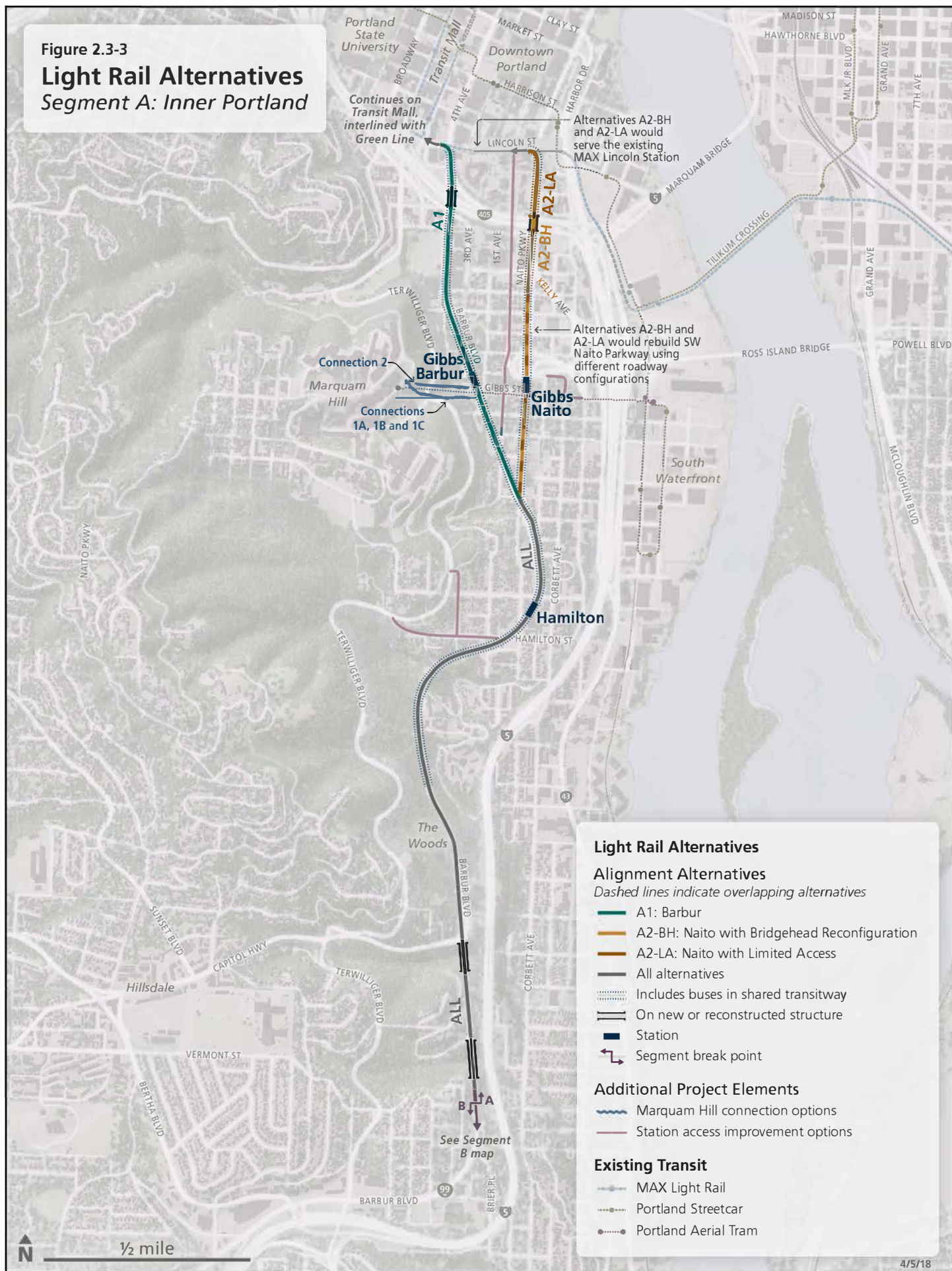


Segment A includes options for a Marquam Hill connection, which would connect the light rail station at SW Gibbs Street to the OHSU Marquam Hill complex. Segment A contains three station access improvement options. The Marquam Hill connection options and station access improvement options are described after the alignment alternatives in the following sections.

Figure 2.3-3 illustrates the alignment alternatives, Marquam Hill connection options and station access improvement options in Segment A. See Appendix A for more detailed maps.



**Figure 2.3-3**





### ***Alternative A1: Barbur***



Alternative A1 would run on SW Barbur Boulevard for most of Segment A, primarily operating at grade in the center of the roadway. The light rail alignment for Alternative A1 differs from the other Segment A alignment alternatives between the Transit Mall and the junction of SW Barbur Boulevard and SW Naito Parkway.

Alternative A1 would diverge from the existing MAX tracks just west of the current Lincoln Station, at SW Fourth Avenue and SW Lincoln Street. It would cross Interstate 405 (I-405) on a new structure east of and parallel to SW Fourth Avenue. The alignment would run along the east side of SW Barbur Boulevard for several blocks, then transition into the center of SW Barbur Boulevard at SW Hooker Street. The alignment would continue running in the center of SW Barbur Boulevard until the segment break point near SW Brier Place.

Stations would be located near SW Gibbs Street and SW Hamilton Street. Both stations would use at-grade center platforms. The alternative would add a signalized pedestrian crossing of SW Naito Parkway at SW Gibbs Street to provide access across SW Naito Parkway and onto the pedestrian bridge over I-5 at SW Gibbs Street. The Marquam Hill connection options, described in a separate section below, would provide access between the Gibbs Barbur Station and the Marquam Hill complex.

South of SW Hooker Street, SW Barbur Boulevard would be widened and largely rebuilt to accommodate light rail and to add sidewalks and bike lanes. To address the elevation difference between the west and east sides of SW Barbur Boulevard, parts of Alternative A1 would have retaining walls and changes to the grade of connecting side streets.

The alternative would modify intersections and other vehicle access along SW Barbur Boulevard, and would remove the center two-way turn lane that is in some existing roadway sections. The junction of SW Barbur Boulevard and SW Naito Parkway would be modified from a merge to a signalized intersection. Alternative A1 would modify traffic lanes in other sections, maintaining two lanes in each direction south of the junction of SW Barbur Boulevard and SW Naito Parkway. It would restrict some side-street access from SW Barbur Boulevard to right-in and right-out turns. In the section from SW Hamilton Street to SW Brier Place, Alternative A1 would replace several major bridges, including the Newbury and Vermont trestle bridges and the SW Capitol Highway overpass.

Two miles of the light rail alignment for Alternative A1 would be paved to provide a shared transitway that would allow buses as well as light rail (see Exhibit 2.3-2). Located between SW Lincoln Street and The Woods section of SW Barbur Boulevard, the shared transitway would allow buses to avoid traffic congestion in order to improve travel times and reliability. Buses would exit and re-enter the shared transitway to serve a bus stop at SW Gibbs Street.



## Exhibit 2.3-2

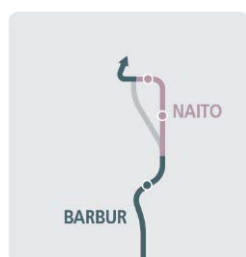
### What is the shared transitway?

A shared transitway is a paved portion of light rail trackway that allows access for buses to improve bus travel time and reliability. The existing MAX Orange Line includes a 1.3-mile shared transitway, which provides access for the bus lines 17 and 9 and the Portland Streetcar approaching and on the Tilikum Crossing bridge.

In Segment A, all of the alignment alternatives would include a 2-mile shared transitway between SW Lincoln Street and The Woods section of SW Barbur Boulevard to allow buses to bypass traffic congestion in South Portland. The buses would serve a stop near SW Gibbs Street to provide access to Marquam Hill.

The final decision on bus network changes in support of the Southwest Corridor Light Rail Project, including which buses would use the shared transitway, would be made much closer to opening day. For the purpose of this Draft EIS analysis, TriMet's bus line 54 is assumed to use the shared transitway, while line 44 would continue to provide local service between Hillsdale and downtown Portland.

### ***Alternative A2-BH: Naito with Bridgehead Reconfiguration***



Alternative A2-BH differs from Alternative A1 between the Transit Mall and the junction of SW Barbur Boulevard and SW Naito Parkway, where Alternative A2-BH would operate on SW Naito Parkway instead of on SW Barbur Boulevard.

The alignment would serve the existing Lincoln Station located at SW Lincoln Street and SW 3rd Avenue, and would run for a short distance along the MAX Orange Line tracks before turning south onto a largely rebuilt SW Naito Parkway.

It would operate at grade in the center of SW Naito Parkway, and would include the Bridgehead Reconfiguration changes along SW Naito Parkway and surrounding streets (see Exhibit 2.3-1 for background information). The alignment would connect to SW Barbur Boulevard using an underpass for light rail between SW Curry Street and SW Bancroft Street. South of SW Bancroft Street, the alternative would be identical to Alternative A1.

Alternative A2-BH would include stations on SW Naito Parkway at SW Gibbs Street, with an alternate location at SW Hooker Street, and on SW Barbur Boulevard at SW Hamilton Street. Both stations would use at-grade center platforms. The alternative would reconstruct the existing stair connection between SW Barbur Boulevard and SW Gibbs Street to add a ramp, and would add a signalized pedestrian crossing of SW Barbur Boulevard. The Marquam Hill connection options, described in a separate section below, would provide access between the OHSU Marquam Hill complex and SW Barbur Boulevard bus stops and the Gibbs Naito Station.

To rebuild SW Naito Parkway to accommodate light rail, the alternative would replace several of the bridge structures along SW Naito Parkway, including the overcrossings of I-405 and SW Kelly Avenue. The Bridgehead Reconfiguration would create several new at-grade signalized intersections along SW Naito Parkway, including at the Gibbs Naito Station. These new roadway connections would provide additional neighborhood access for autos, bicycles and pedestrians where it is currently restricted. The alternative would largely reconfigure the connection of SW Naito Parkway and SW Barbur Boulevard, creating a new at-grade signalized intersection with crosswalks.

As with the other Segment A alignment alternatives, Alternative A2-BH would include the shared transitway between SW Lincoln Street and The Woods section of SW Barbur Boulevard (see Exhibit 2.3-2).



### ***Alternative A2-LA: Naito with Limited Access***



Alternative A2-LA would follow the same alignment as Alternative A2-BH and have the same station locations and the same pedestrian connection at SW Barbur Boulevard and SW Gibbs Street. As with Alternative A2-BH, it would rebuild SW Naito Parkway to accommodate center-running light rail but would not include the Bridgehead Reconfiguration. Instead, Alternative A2-LA would largely maintain SW Naito Parkway's current roadway access restrictions.

The alternative would widen the roadway for light rail and reconstruct the existing ramps to the bridge to accommodate the added width. The alternative would add one new at-grade intersection at SW Naito Parkway and SW Gibbs Street. It would reconstruct the existing pedestrian bridge over SW Naito Parkway at SW Hooker Street. Unlike Alternatives A1 and A2-BH, Alternative A2-LA would retain the current merge pattern at the junction of SW Barbur Boulevard and SW Naito Parkway. Between this junction and SW Hamilton Street, the alternative would retain three traffic lanes in each direction in addition to the center-running light rail.

As with the other Segment A alignment alternatives, Alternative A2-LA would include the shared transitway between SW Lincoln Street and The Woods section of SW Barbur Boulevard (see Exhibit 2.3-2). For Alternative A2-LA, buses would serve a stop at SW Gibbs Street within the shared transitway, because the limited-access configuration would not include signals allowing buses to exit and re-enter the transitway. The added bus stop within the shared transitway would result in a larger footprint of impact at the Gibbs Naito Station than Alternative A2-BH.

### ***Marquam Hill Connection Options***

The Marquam Hill connection options would link SW Barbur Boulevard near SW Gibbs Street to the OHSU Kohler Pavilion on Marquam Hill to provide access between the proposed station near SW Gibbs Street and the jobs and services at the medical facilities located at the top of the hill, including OHSU, the Veterans Affairs (VA) Portland Health Care System and the Portland Shriners Hospital for Children.

There are four connection options, which include combinations of tunnels, elevators and bridges. All four of the connection options are compatible with all of the Segment A alignment alternatives. Figure 2.3-3 shows the general location of the connection options, and Table 2.3-4 summarizes the differences between them. Appendix A provides maps, elevation profiles and detailed descriptions of the connection options (see Figures A-24 through A-27).

### ***Station Access Improvement Options***

In addition to the walking and biking improvements along SW Barbur Boulevard and SW Naito Parkway included in the alignment alternatives, this Draft EIS studies three station access improvement options in Segment A that could pair with any of the alignment alternatives (see Figure A-30 in Appendix A). These investments would improve walking and biking access to the proposed light rail stations. Within Segment A, station access improvements include adding bikeways, sidewalks and enhanced pedestrian crossings.



**Table 2.3-4. Comparison of Marquam Hill Connection Options**

Connection Segment	Marquam Hill Connection Option			
	1A: Elevator/Bridge and Path	1B: Elevator/Bridge and Recessed Path	1C: Elevator/Bridge and Tunnel	2: Full Tunnel
SW Barbur Blvd. to SW Terwilliger Blvd.	· At-grade path · Elevator and stairs · Bridge	· At-grade path · Elevator and stairs · Bridge	· At-grade path · Elevator and stairs · Bridge	· At-grade path · Tunnel
Crossing SW Terwilliger Blvd.	· At-grade crossing	· Underpass	· Underpass	· Tunnel (continued)
SW Terwilliger Blvd. to SW Campus Dr.	· Stairs and ramps · Elevator and stairs · Bridge	· Stairs and ramps · Recessed path · Elevator and stairs	· Stairs and ramps · Tunnel · Elevator and stairs	· Tunnel (continued) · Elevator and stairs
Crossing SW Campus Dr.	· At-grade crossing	· Bridge	· Bridge	· Bridge
Access to Kohler Pavilion	· 3rd floor	· 7th floor	· 7th floor	· 7th floor

## Segment B: Outer Portland

Segment B extends from SW Barbur Boulevard at SW Brier Place to the intersection of SW 68th Parkway and SW Atlanta Street, just west of the Portland/Tigard city boundary (see Figure 2.3-1). In this segment, the alignment alternatives all have sections that would widen the roadway to accommodate light rail in the center of SW Barbur Boulevard while maintaining existing travel lanes. Three of the four alternatives would also transition to run adjacent to I-5, offset from SW Barbur Boulevard.

All of the Segment B alignment alternatives would include park and ride structures at the Barbur Transit Center and 53rd Stations, though the placement of these garage structures relative to the stations and the estimated vehicle capacities vary slightly by alternative.

Figure 2.3-4 illustrates the alignment alternatives, PCC-Sylvania shuttle options and station access improvement options in Segment B. See Appendix A for more detailed maps.

Segment B also contains two options for a shuttle connection to PCC-Sylvania and 20 station access improvement options. These options are described after the alignment alternatives in the following sections.

### ***Alternative B1: Barbur***



Alternative B1 would run in the center of SW Barbur Boulevard until SW 60th Avenue. The portion of the alignment on SW Barbur Boulevard south of the Barbur Transit Center is unique to Alternative B1.

The alternative would widen SW Barbur Boulevard throughout the segment north of SW 60th Avenue to accommodate light rail tracks, bicycle lanes and sidewalks. Part of the widening would be accomplished by removing two-way center turn lanes and on-street parking where they exist. The alternative would reconstruct several bridges along SW Barbur Boulevard, including the bridge over I-5 at the intersection of SW Barbur Boulevard and SW Capitol Highway. The alternative would construct additional signalized intersections on SW Barbur Boulevard to accommodate left turns and U-turns. Other side-street and driveway access along SW Barbur Boulevard would be limited to right-in and right-out only.



Figure 2.3-4

# **Light Rail Alternatives** **Segment B: Outer Portland**

## **Overview of Segment B Alignment Alternatives**



## **Light Rail Alternatives**

### **Alignment Alternatives**

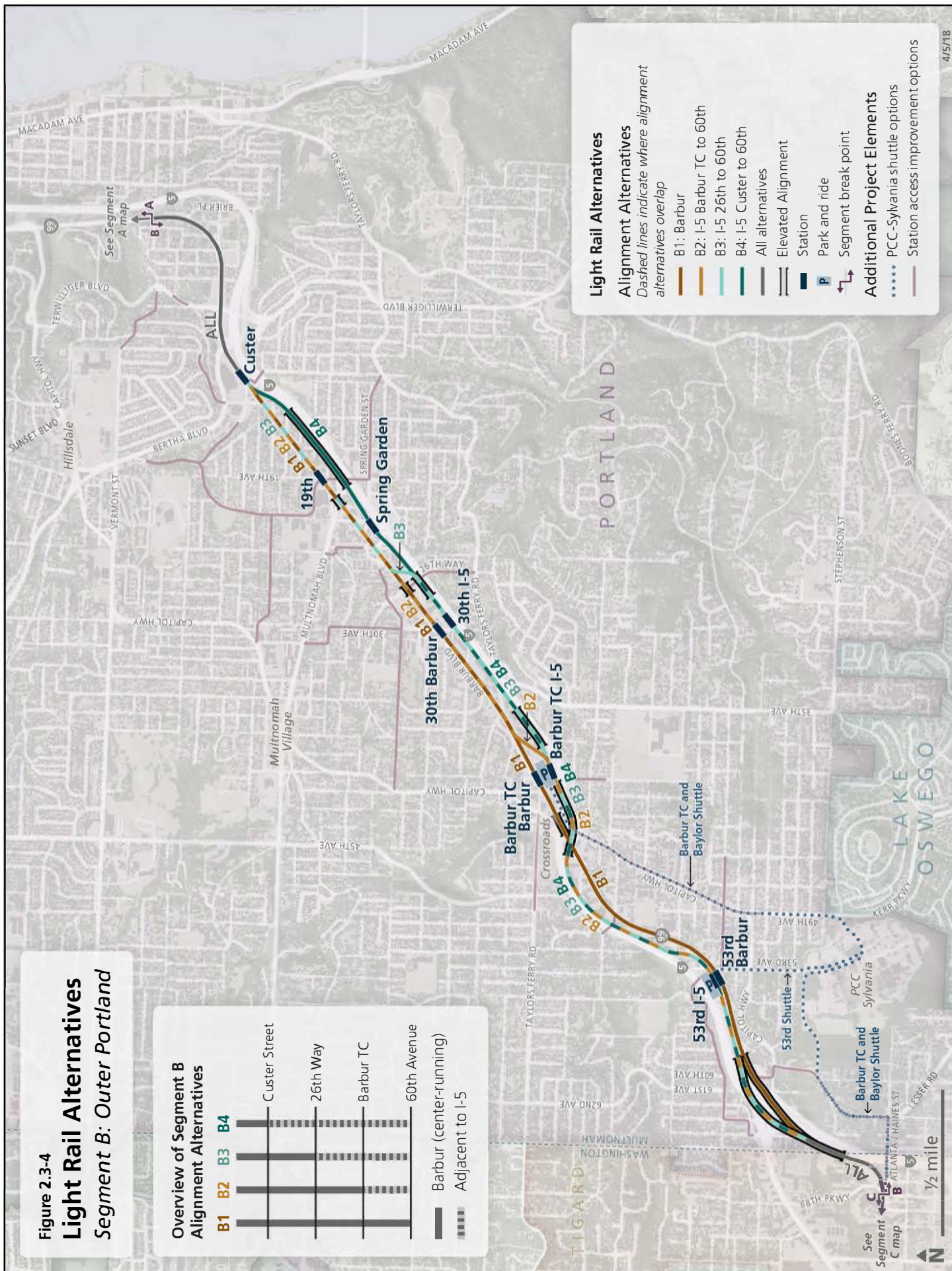
Dashed lines indicate where alignment alternatives overlap

- B1: Barbur
- B2: I-5 Barbur TC to 60th
- B3: I-5 26th to 60th
- B4: I-5 Custer to 60th
- All alternatives

- Elevated Alignment
- Station
- Park and ride
- Segment break point

### **Additional Project Elements**

- PCC-Sylvania shuttle options
- Station access improvement options





West of SW 60th Avenue, the alignment would cross over I-5 between SW Barbur Boulevard and the Tigard Triangle on a new light rail structure (see Exhibit 2.3-3 for more information on the Tigard Triangle). The alignment would continue south on the structure along the west side of I-5, then turn west and drop below the ground level to an underpass below SW 68th Parkway.

Stations would be located at grade in the center of SW Barbur Boulevard at SW Custer Street, SW 19th Avenue, SW 30th Avenue (or an alternate location near SW 26th Way), the Barbur Transit Center and SW 53rd Avenue. Three-level park and ride structures would be included at the Barbur Transit Center and 53rd Stations, with up to 825 and 950 spaces, respectively (see Figures A-17 and A-18 in Appendix A for detailed maps). All Segment B alignment alternatives would rebuild SW 53rd Avenue with new pavement, sidewalks, stormwater controls and lighting to improve the walking and biking access between the light rail station and PCC-Sylvania.

### Exhibit 2.3-3

#### What is the Tigard Triangle?

The “Tigard Triangle” usually refers to the triangle-shaped area bounded by I-5, Highway 217 and Pacific Highway. (In Section 3.4, Communities, the Tigard Triangle neighborhood extends farther southwest beyond Highway 217 to SW Hall Boulevard, the WES/freight railroad tracks and SW Bonita Road.)

The east half of the Tigard Triangle has a gridded street network with a mix of housing and office buildings, while the west half of the Tigard Triangle contains larger retail businesses with some pockets of smaller businesses and housing. A lack of access and missing sewer and stormwater infrastructure have limited development of the Tigard Triangle, and large expanses of vacant land remain.

Local planning has explored ways to overcome these constraints and focus new growth in the Tigard Triangle. The *Tigard Triangle Strategic Plan* (City of Tigard, 2015) outlines a vision of an area with a diverse mix of uses in an enjoyable walking environment with improved connectivity for all travel modes. The city’s *High Capacity Transit Land Use Plan* (City of Tigard, 2012) identified the Tigard Triangle as a potential high capacity transit station area community in advance of Southwest Corridor planning.

### Alternative B2: I-5 Barbur Transit Center to 60th



Alternative B2 would be identical to Alternative B1 from SW Brier Place to just north of the Barbur Transit Center, where light rail would transition away from the center of SW Barbur Boulevard to run adjacent to I-5. South of the Barbur Transit Center, the alignment would cross over I-5, SW Capitol Highway and SW Barbur Boulevard on a new light rail structure, and then continue adjacent to I-5 until SW 60th Avenue. West of SW 60th Avenue, the alignment would cross over I-5 and SW Barbur Boulevard on a new light rail structure, continue south on the structure along the west side of I-5, then turn west and drop below the ground level to an underpass below SW 68th Parkway.

North of the Barbur Transit Center, the station locations would be the same as for Alternative B1. The Barbur Transit Center and 53rd Stations would be adjacent to I-5 instead of in the center of SW Barbur Boulevard, but they would still be at grade and include three-level park and ride structures. The Barbur Transit Center Park and Ride would have up to 725 spaces (100 fewer spaces than for Alternative B1) and the 53rd Park and Ride would have up to 950 spaces (same number of spaces as for Alternative B1). See Figures A-17 and A-18 in Appendix A for detailed maps of the park and rides.



Alternative B2 would include the same walking and biking improvements on SW 53rd Avenue as Alternative B1.

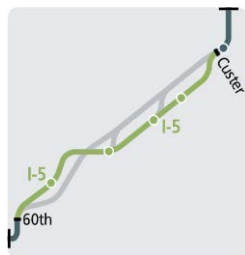
#### ***Alternative B3: I-5 26th to 60th***



Alternative B3 would be identical to Alternatives B1 and B2 from SW Brier Place to SW 26th Way, where it would transition to run adjacent to I-5. The alignment would depart from SW Barbur Boulevard at a new signalized and gated intersection just north of SW 26th Way. It would cross SW 26th Way on a new light rail structure adjacent to I-5. It would continue south, running along the west side of I-5, primarily at grade but with an 850-foot-long structure approaching the Barbur Transit Center. South of the Barbur Transit Center, the alternative would be identical to Alternative B2.

Station locations and park and rides would be identical to those of Alternative B2, except that the 30th Station would be at grade adjacent to I-5. Alternative B3 would include the same walking and biking improvements to SW 53rd Avenue as Alternative B1.

#### ***Alternative B4: I-5 Custer to 60th***



Of the Segment B alignment alternatives, Alternative B4 would run for the longest distance adjacent to I-5. The alignment would transition from SW Barbur Boulevard to I-5 at SW Custer Street. North of SW Custer Street, Alternative B4 would be identical to the other Segment B alignment alternatives. The alignment would depart SW Barbur Boulevard at a new signalized and gated intersection at SW Custer Street and would generally run along the portion of SW Multnomah Boulevard alongside I-5 north of SW 19th Avenue. As a result, SW Multnomah Boulevard would be closed between SW Barbur Boulevard and SW 17th Avenue. The alignment along I-5 would alternate between at-grade and elevated sections, depending on the grades and the location of I-5 crossings and ramps. South of SW 26th Way, Alternative B4 would be identical to Alternative B3.

The Custer Station would be identical to that of Alternative B1, and the 30th, Barbur Transit Center and 53rd Stations would be identical to those of Alternative B3. Instead of the 19th Station included in Alternatives B1, B2 and B3, Alternative B4 would include the Spring Garden Station, which would be at grade adjacent to I-5. Park and rides would be identical to those of Alternatives B2 and B3. Alternative B4 would include the same walking and biking improvements on SW 53rd Avenue as Alternative B1.

#### ***PCC-Sylvania Shuttle Options***

Because it would require about a 0.5-mile walk to access the PCC-Sylvania campus from the nearest proposed light rail station, the project includes two options for a shuttle to connect to PCC-Sylvania. The shuttle would supplement the pedestrian and bicycle improvements on SW 53rd Avenue that are included with all Segment B alignment alternatives. The shuttle would operate at the same service frequency as light rail, ranging from every 7 to 15 minutes in 2035 (see Chapter 3 – Transportation Impacts and Mitigation). The two PCC-Sylvania shuttle options are illustrated in Figure 2.3-4 and described below.

- **Barbur Transit Center and Baylor Shuttle** would operate in mixed traffic on a 2.7-mile route with stops at the Barbur Transit Center, the PCC-Sylvania campus, and the Baylor Station or Clinton



Station in the Tigard Triangle, depending on the alignment alternative. Intermediate stops on SW Capitol Highway and SW Lesser Road could be possible. The shuttle would use about five standard 40-foot TriMet buses to operate.

- **53rd Shuttle** would operate in mixed traffic on an up to 0.5-mile route along SW 53rd Avenue between the PCC-Sylvania campus and the 53rd Station. Currently, a portion of SW 53rd Avenue is undeveloped, and the street dead ends at G Street on the edge of the campus. All Segment B alignment alternatives would rebuild the street with new pavement, sidewalks, stormwater controls and lighting to improve walking and biking access to the campus. The 53rd Shuttle would use this same improved roadway, with the addition of an exclusive ramp for the shuttle to connect to the campus. This shuttle option would use about three small van-sized shuttle buses to operate.

Both shuttle options would include bus bays and related passenger facilities on the PCC-Sylvania campus. These specific elements will be defined after the selection of a shuttle route and will be included in the Final EIS.

### ***Station Access Improvement Options***

In addition to the walking and biking investments along SW Barbur Boulevard, there are 20 station access improvements in Segment B, including bikeways, sidewalks, enhanced pedestrian crossings and pedestrian bridges over I-5 (see Figure A-31 in Appendix A).

### **Segment C: Tigard and Tualatin**

This segment extends from the intersection of SW 68th Place and SW Atlanta Street, just west of the Portland/Tigard city boundary, to Bridgeport Village in Tualatin, which would be the southern terminus of the light rail alignment (see Figure 2.3-1).

The segment includes six light rail alternatives, each using one of two *route configurations*:

- **Through Route** to Bridgeport Village via downtown Tigard (see Figure 2.3-5)
- **Branched Route** with a split in the Tigard Triangle, where some trains would continue south to Bridgeport Village while others would turn west to serve downtown Tigard (see Figure 2.3-6)

Segment C contains four alignment alternatives for a Through Route (Alternatives C1 through C4) and two for a Branched Route (Alternatives C5 and C6). The four through-routed alignment alternatives are based on two alignments north of downtown Tigard (Clinton and Ash) and two alignments south of downtown Tigard (Railroad and I-5). The two branched alignment alternatives are based on two alignments between the Tigard Triangle and downtown Tigard (Ash and Wall).

Figures 2.3-5 and 2.3-6 illustrate the Segment C alignment alternatives, O&M facility options and station access improvement options for the Through Route (Alternatives C1, C2, C3 and C4) and Branched Route (Alternatives C5 and C6), respectively. See Appendix A for more detailed maps.

Segment C also includes three options for an O&M facility to support light rail operations and six station access improvement options. These options are described after the alignment alternatives in the following sections.



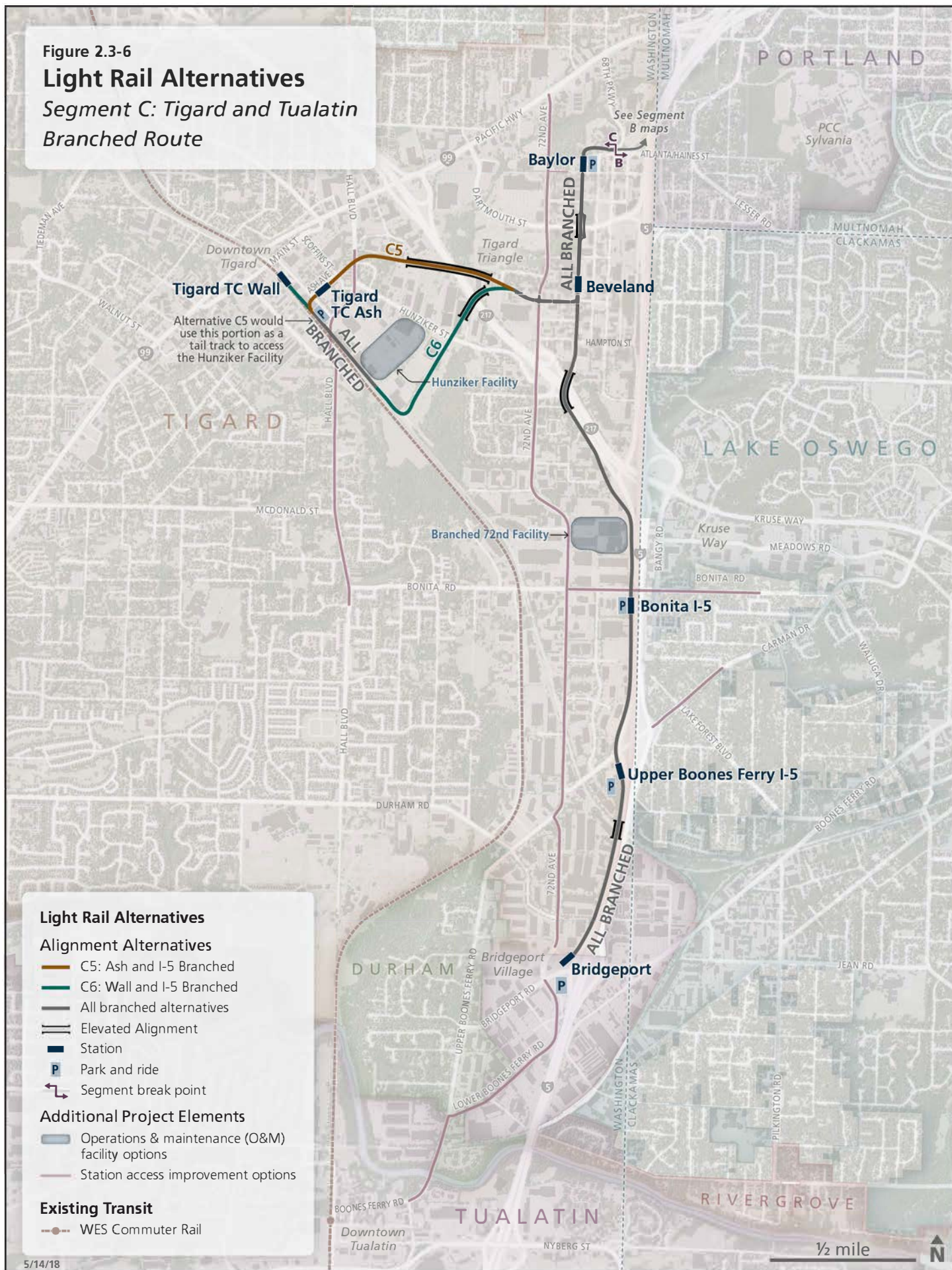
## Light Rail Alternatives

### Segment C: Tigard and Tualatin Through Route





**Figure 2.3-6**  
**Light Rail Alternatives**  
*Segment C: Tigard and Tualatin*  
*Branched Route*





### ***Alternative C1: Ash to I-5***



This through-routed alternative would use the Ash alignment between the Tigard Triangle and downtown Tigard, and the I-5 alignment between downtown Tigard and Bridgeport Village (see Exhibit 2.3-3 for more information on the Tigard Triangle). In the Tigard Triangle, the alignment would be side-running along the east side of SW 70th Avenue. Between SW Atlanta Street and SW Beveland Street, Alternative C1 would construct missing portions of the SW 70th Avenue roadway. At the intersection of SW 70th Avenue with SW Dartmouth Street, light rail would cross over SW Dartmouth Street on a new structure, while the auto lanes would remain at grade. The route would turn west on SW Beveland Street and then cross over

Highway 217 on a new light rail bridge with a multi-use path to reach downtown Tigard. The alignment would cross SW Hall Boulevard just north of SW Knoll Drive, then run on SW Ash Avenue between SW Scoffins Street and SW Commercial Street.

Alternative C1 would include two stations in the Tigard Triangle and one in downtown Tigard. The northern Tigard Triangle station would be at grade on SW 70th Avenue near SW Baylor Street, and would include a three-level park and ride structure with 425 spaces. The southern Tigard Triangle station would be on SW 70th Avenue near SW Beveland Street. The downtown Tigard station would be at grade on SW Ash Avenue, and would be paired with a reconfigured and relocated Tigard Transit Center and a three-level park and ride structure with 300 spaces. See Figures A-19 and A-20 for maps of the park and rides at the Baylor and Tigard Transit Center Stations. The alternative includes a new auto, walking and biking crossing of the railroad at SW Ash Avenue, connecting SW Commercial Street and SW Burnham Street.

South of downtown Tigard, the alignment would travel southeast along the freight rail and WES Commuter Rail tracks before turning east near SW Landmark Lane until reaching I-5. At I-5, the alignment would continue south adjacent to the freeway, passing under SW Bonita Road and SW Upper Boones Ferry Road, until SW Lower Boones Ferry Road near Bridgeport Village, where the line would terminate. Alternative C1 would include stations and park and rides at SW Bonita Road, SW Upper Boones Ferry Road and Bridgeport Village. The Bonita and Upper Boones Ferry Stations would be at grade with adjacent properties but 10 to 20 feet below the level of the adjacent roadway. The Bonita park and ride would include 150 spaces on a surface lot. The Upper Boones Ferry and Bridgeport park and rides would both be structured with three levels, and would have 600 and 950 spaces, respectively. See Figures A-21, A-22 and A-23 in Appendix A for maps of the park and rides.

### ***Alternative C2: Ash to Railroad***



This through-routed alternative would be identical to Alternative C1 between the Tigard Triangle and downtown Tigard, including station locations and park and rides.

It would use the Railroad alignment between downtown Tigard and Bridgeport Village. South of downtown Tigard, the alignment would continue along the freight rail tracks instead of turning east toward I-5. The alignment would be elevated between just south of SW Tech Center Drive and just south of SW Bonita Road to avoid a freight rail spur track, including an elevated crossing over SW Bonita Road.

The alignment would continue adjacent to the railroad at grade and cross SW 72nd Avenue and



SW Upper Boones Ferry Road with at-grade gated intersections. The route would reach I-5 about 0.25 mile south of SW Upper Boones Ferry Road before turning south to the terminus at SW Lower Boones Ferry Road near Bridgeport Village.

Stations and park and rides would be included at SW Bonita Road, SW Upper Boones Ferry Road and Bridgeport Village. The Bonita Station would be elevated, and the Upper Boones Ferry Station would be at grade. The Bonita and Upper Boones Ferry Stations would include surface park and ride lots with 100 and 50 spaces, respectively. The Bridgeport Station and Park and Ride would be identical to those included with Alternative C1.

### ***Alternative C3: Clinton to I-5***

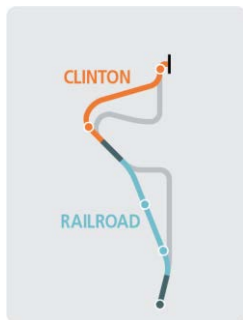


This through-routed alignment alternative would use the Clinton alignment between the Tigard Triangle and downtown Tigard, and the I-5 alignment between downtown Tigard and Bridgeport Village. Similar to Alternatives C1 and C2, the Alternative C3 alignment would be side-running on SW 70th Avenue south of SW Atlanta Street, but instead of continuing south on SW 70th Avenue to serve the southern portion of the Tigard Triangle, the alignment would turn west on SW Clinton Street to cross over SW Dartmouth Street and Highway 217 on a new light rail bridge with a multi-use path. The alignment would cross SW Hall Boulevard at grade south of Pacific Highway to approach downtown Tigard, and then would travel along a new street parallel to SW Main Street until the WES Commuter Rail tracks. The alignment would then turn south to run parallel to the WES tracks.

Alternative C3 would include one station in the Tigard Triangle, near SW 70th Avenue and SW Clinton Street, and one station near a reconfigured Tigard Transit Center. The Clinton and Tigard Transit Center Stations would both be at grade, and would both include three-level park and ride structures, which would have 425 and 275 spaces, respectively.

South of downtown Tigard, Alternative C3 would be identical to Alternative C1, including station locations and park and rides.

### ***Alternative C4: Clinton to Railroad***



This through-routed alternative would use the Clinton alignment between the Tigard Triangle and downtown Tigard, and the Railroad alignment between downtown Tigard and Bridgeport Village. The alignment, station locations, and park and rides for this alternative would be identical to Alternative C3 for those north of downtown Tigard and identical to Alternative C2 for those south of downtown Tigard.



### ***Alternative C5: Ash and I-5 Branched***



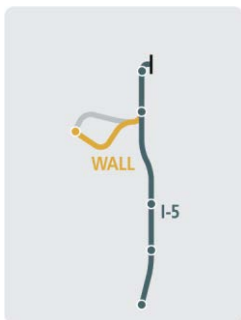
This branched alternative would use the Ash alignment for the Tigard branch and the I-5 alignment for the Bridgeport branch. North of the branch split point at the Beveland Station, this alternative would be identical to Alternative C1.

Routing and station locations for the Tigard branch of this alternative would be similar to those for Alternatives C1 and C2 between the Beveland and Tigard Transit Center Stations. Alternative C5 would include a 0.3-mile double-tracked tail track adjacent to the WES and freight rail tracks for operational flexibility and to access the Hunziker O&M Facility location.

The Bridgeport branch would extend south from the Beveland Station along the SW 70th Avenue right of way and cross over Highway 217 on a new light rail structure with a multi-use path. The alignment would continue south adjacent to Highway 217 and I-5 to the terminus at Bridgeport Village.

Alternative C5 would include the same station and park and ride locations as Alternative C1, and the same new auto, walking and biking crossing of the railroad at SW Ash Avenue.

### ***Alternative C6: Wall and I-5 Branched***



This branched alternative would use the Wall alignment for the Tigard branch and the I-5 alignment for the Bridgeport branch. In this alternative, the Tigard branch would extend west on SW Beveland Street and would cross over Highway 217 to connect to SW Wall Street at SW Hunziker Street. At the end of SW Wall Street, the alignment would turn northwest and run parallel to the WES/freight rail tracks to terminate near a reconfigured Tigard Transit Center, including an at-grade crossing of SW Hall Boulevard. The Bridgeport branch in this alternative would be identical to that of Alternative C5.

With the exception of the Tigard Transit Center Station, Alternative C6 would include the same station and park and ride locations as Alternative C1. The Tigard Transit Center Station would be at grade adjacent to the WES station and a reconfigured transit center with three tracks for operational flexibility. The station would include a three-level park and ride structure with 275 spaces.

### ***Operations and Maintenance (O&M) Facility Options***

The project would construct a new light rail O&M facility to accommodate the added 32 light rail vehicles in the TriMet system. There are two locations being considered for a light rail O&M facility in Tigard, one of which includes variations to pair with each route configuration. The Segment C alignment maps show the locations of these three O&M facility options (see Figures 2.3-5 and 2.3-6). See Figures A-29 and A-30 in Appendix A for more detailed maps of the O&M facility options.

The first location, the **Hunziker Facility**, would encompass about 20 acres near downtown Tigard adjacent to the freight rail tracks and SW Hunziker Street, and could serve any of the Segment C alignment alternatives. The facility layout would be designed to provide 9,000 feet of storage track for approximately 42 light rail vehicles (storage for 10 more vehicles than needed for the project to allow for system growth and operations flexibility) and accommodate most maintenance functions necessary to operate the light rail system, including 10 maintenance bays, a space for wheel truing, vehicle wash



area, a unit repair facility (for vehicle parts) and parts storage (both indoor and outdoor). The Hunziker Facility could accommodate additional storage tracks for up to 60 vehicles total to support additional system growth in the future. The Hunziker Facility would also include a surface parking lot for employees and fleet vehicles, administrative space to support the on-site operations, and on-site stormwater management. Up to 85 percent of the site would be improved with impervious surfaces, consistent with local zoning regulations for industrial development. Light rail vehicles would access this facility via switches on the main light rail alignment parallel to the WES and freight railroad tracks.

The second location, referred to as the 72nd Facility, would encompass about 17 acres southeast of the Tigard Triangle between SW 72nd Avenue and I-5. This location would provide the same facilities as the Hunziker Facility, but with slightly reduced storage and maintenance capacity. There are two options for the specific location and layout of this facility, depending on the light rail alignment:

- The **Through 72nd Facility** would be across from SW Landmark Lane and could serve the through-routed alternatives that would operate adjacent to I-5 south of Tigard (Alternatives C1 and C3). Light rail vehicles would access this facility via switches on the adjacent exclusive trackway to the south of the site (between SW 72nd Avenue and I-5).
- The **Branched 72nd Facility** would shift the facility slightly to the north to serve the branched alternatives (Alternatives C5 and C6). Light rail vehicles would access this facility via switches on the trackway adjacent to I-5.

Both 72nd Facility options would provide 7,500 feet of storage track for approximately 36 light rail vehicles, vehicle wash, parts storage (both indoor and outdoor), surface parking for employees and fleet vehicles, administrative space to support on-site operations and on-site stormwater management. Both options would improve up to 85 percent of the site with impervious surfaces, consistent with local zoning regulations for industrial development.

### ***Station Access Improvement Options***

There are six station access improvement options in Segment C that could be paired with any of the alignment alternatives (see Figure A-32 in Appendix A). These investments include adding bikeways, sidewalks and enhanced pedestrian crossings to improve walking and biking access to the proposed light rail stations.

### **Construction Activities**

The anticipated construction activities associated with the light rail alternatives are summarized below and described in more detail in Appendix A. This information is based on conceptual design and typical construction practices. Construction practices will continue to be refined during the preliminary and final design stages.

Construction could begin as early as 2021 following a Record of Decision, final design and funding agreements. Although construction activities would occur over the length of the project during this time, the impact would not be continuous along the corridor for the full duration, because the project would likely be divided into various segments or line sections for construction.

Construction would include activities such as demolitions, utility relocations, construction of the light rail project elements, and stormwater treatments and landscaping. In addition, construction typically



requires staging areas for activities such as stockpiling materials, assembling project elements and locating construction field administration offices. Specific staging area locations will be identified when the project is in final design.

Where possible, construction activities would be coordinated with other capital improvement projects, including projects carried out by the local jurisdictions, to help minimize construction impacts. In addition, TriMet will actively engage with local jurisdictions as the project nears construction to develop a Conduct of Construction plan that would guide coordination throughout construction.

## **2.4. Minimum Operable Segment (MOS)**

An MOS could be constructed as the first phase of the full-length light rail project, and would have the ability to function as a standalone project with logical termini until further extensions can be developed. This Draft EIS considers two MOS options: Tigard Transit Center and Bridgeport (see Figure 2.4-1). Both MOS options could use any of the alignment alternatives in Segments A and B. In Segment C, only the Branched Route (Alternatives C5 and C6) would be compatible with the Bridgeport MOS. These options were chosen because either would serve a majority of the corridor and provide benefits on a regional scale. Either MOS would substantially reduce costs, and could ultimately be extended to create a full-length alignment described in this Draft EIS.

### **Tigard Transit Center MOS**

With the Tigard Transit Center MOS, the first phase of the light rail project would extend from downtown Portland to terminate at the Tigard Transit Center Station. This MOS would be compatible with either route configuration, though the applicable alignment alternatives would vary:

- **A Through Route** would use the Clinton or Ash alignment to reach the station at the Tigard Transit Center. The second phase would extend south between the station at the Tigard Transit Center and the Bridgeport Station, via either the Railroad or I-5 alignment.
- **A Branched Route** would use either the Ash or the Wall alignment to reach the Tigard Transit Center station. The second phase would extend south from the Tigard Triangle using the I-5 alignment for the Bridgeport branch to reach the Bridgeport Station.

The Tigard Transit Center MOS would use the Hunziker Facility for the O&M facility. For the Clinton or Ash alignment, light rail tracks would extend beyond the station at the Tigard Transit Center to access the O&M facility. This MOS would include all park and rides in Segment B and those at the Baylor and Tigard Transit Center Stations in Segment C.

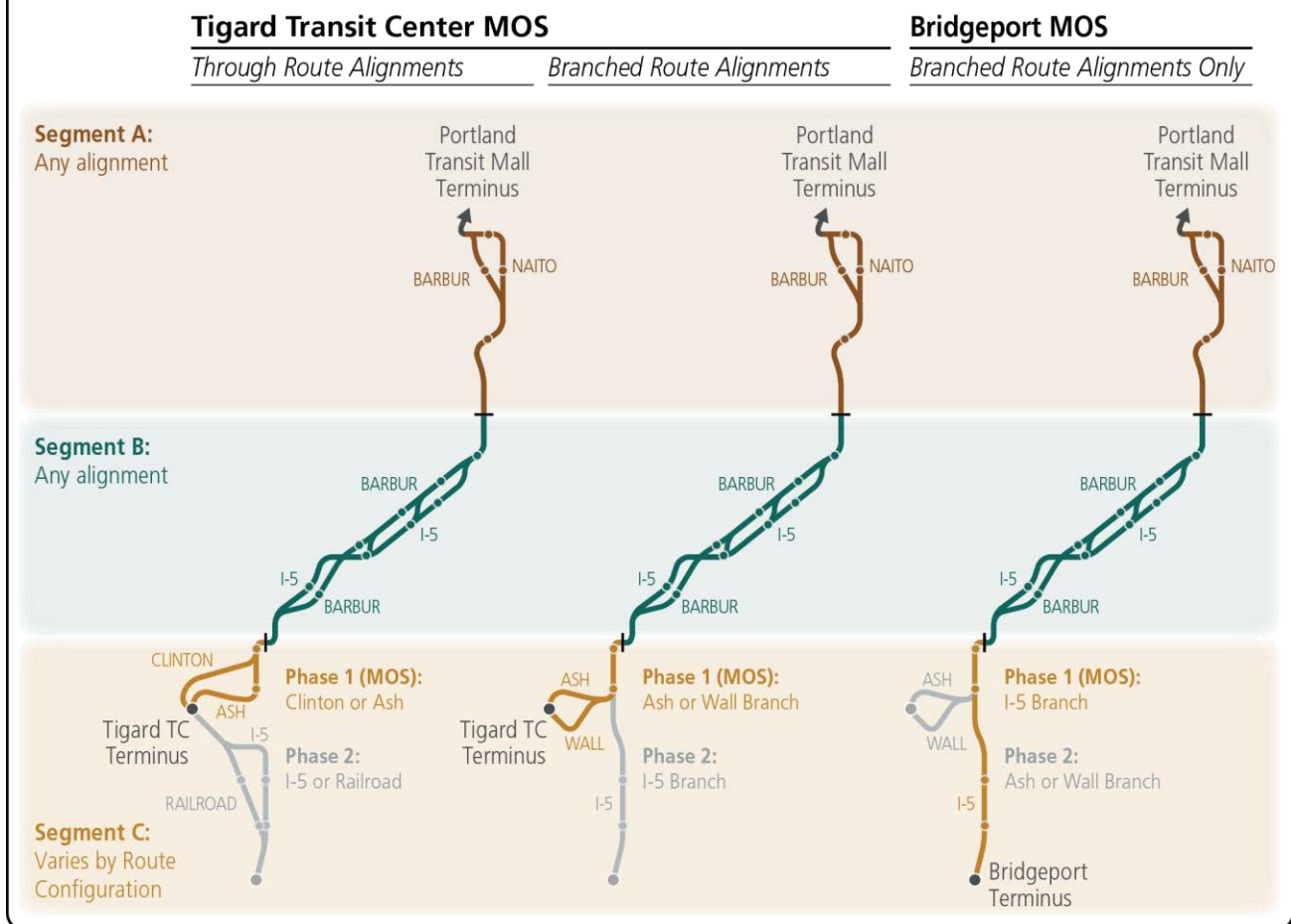
### **Bridgeport MOS**

The Bridgeport MOS would extend light rail from downtown Portland to terminate at Bridgeport Village via the I-5 alignment for the Bridgeport branch in Segment C, which would connect the Beveland Station in the Tigard Triangle to the Bridgeport Station. The second phase would be the downtown Tigard branch between the Beveland Station and the Tigard Transit Center Station, via either the Ash or the Wall alignment.



Figure 2.4-1

## Minimum Operable Segment (MOS) Options



The Bridgeport MOS would include the Branched 72nd Facility for the O&M facility. It would include all park and rides in Segment B and all in Segment C, except for the structure at the Tigard Transit Center, which would be constructed in the second phase.

## 2.5. Potential Design Refinements and Options

This section describes potential modifications to the light rail alternatives, including design refinements and other options. Figure 2.5-1 shows the general location of the design refinements and options. For more information, including more detailed maps, see Appendix E – Potential Design Refinement Concepts and Options.

### Design Refinements

Based on the impact analysis conducted for this Draft EIS, TriMet, Metro and their partners developed six design refinements that would modify alignment alternatives to avoid or minimize impacts:

- Refinement 1: Barbur Woods East-Side Running
- Refinement 2: Taylors Ferry I-5 Overcrossing
- Refinement 3: I-5 Undercrossing



- Refinement 4: Barbur Undercrossing
- Refinement 5: Elmhurst
- Refinement 6: Tigard Transit Center Station East of Hall

Appendix E describes these refinements in more detail and provides a map of each refinement. Appendix E also discusses, at a general level, how these refinements could change the impacts of the alignment alternatives studied in this Draft EIS. Some of these design refinements would result in different property acquisition impacts, which are shown in Appendix F – Properties Affected by Acquisitions. If these refinements are included in the Preferred Alternative, the associated impacts will be analyzed in more detail in the Final EIS.

### **Bridgehead Reconfiguration Option**

The Bridgehead Reconfiguration roadway changes along SW Naito Parkway and SW Kelly Avenue could be added to Alternative A1 as an option. Appendix E describes how the Bridgehead Reconfiguration would change the impacts of Alternative A1.

### **Alternative Station Location Options**

Some different station location options could be considered to reduce impacts compared to the stations that are part of the alignment alternatives. These include:

- shifting the Naito Gibbs Station (Alternatives A2-BH and A2-LA) four blocks north to SW Hooker Street
- shifting the 30th Barbur Station (Alternatives B1 and B2) or 30th I-5 Station (Alternatives B3 and B4) four blocks north to SW 26th Way
- shifting the Beveland Station (Alternatives C1 and C2) around a corner to be on SW Beveland Street between SW 70th Avenue and SW 72nd Avenue

## **2.6. Initial Route Proposal**

This Draft EIS identifies a draft Preferred Alternative, known as the initial route proposal, to give the public and federal, state and local agencies, and tribal governments an opportunity to comment on a full-length light rail alternative. After the close of public comments on the Draft EIS, input on the initial route proposal will inform the selection of the Preferred Alternative to study in the Final EIS (see Section 1.5, Next Steps, for more information).

The initial route proposal was developed by project partner staff based on information from the Draft EIS analysis and on public outreach. Chapter 5 – Evaluation of Alternatives provides more information on the impacts of the initial route proposal and the reasoning behind its selection.



Figure 2.5-1

## Design Refinements and Alternate Station Locations

### Design Refinements

- 1 Barbur Woods East-Side Running
- 2 Taylors Ferry At-Grade Crossing
- 3 I-5 Undercrossing
- 4 Barbur Undercrossing
- 5 Elmhurst
- 6 Hunziker

### Alternate Station Locations

- A Hooker Station
- B 26th Station (Barbur or I-5)
- C Beveland Ash Through Station

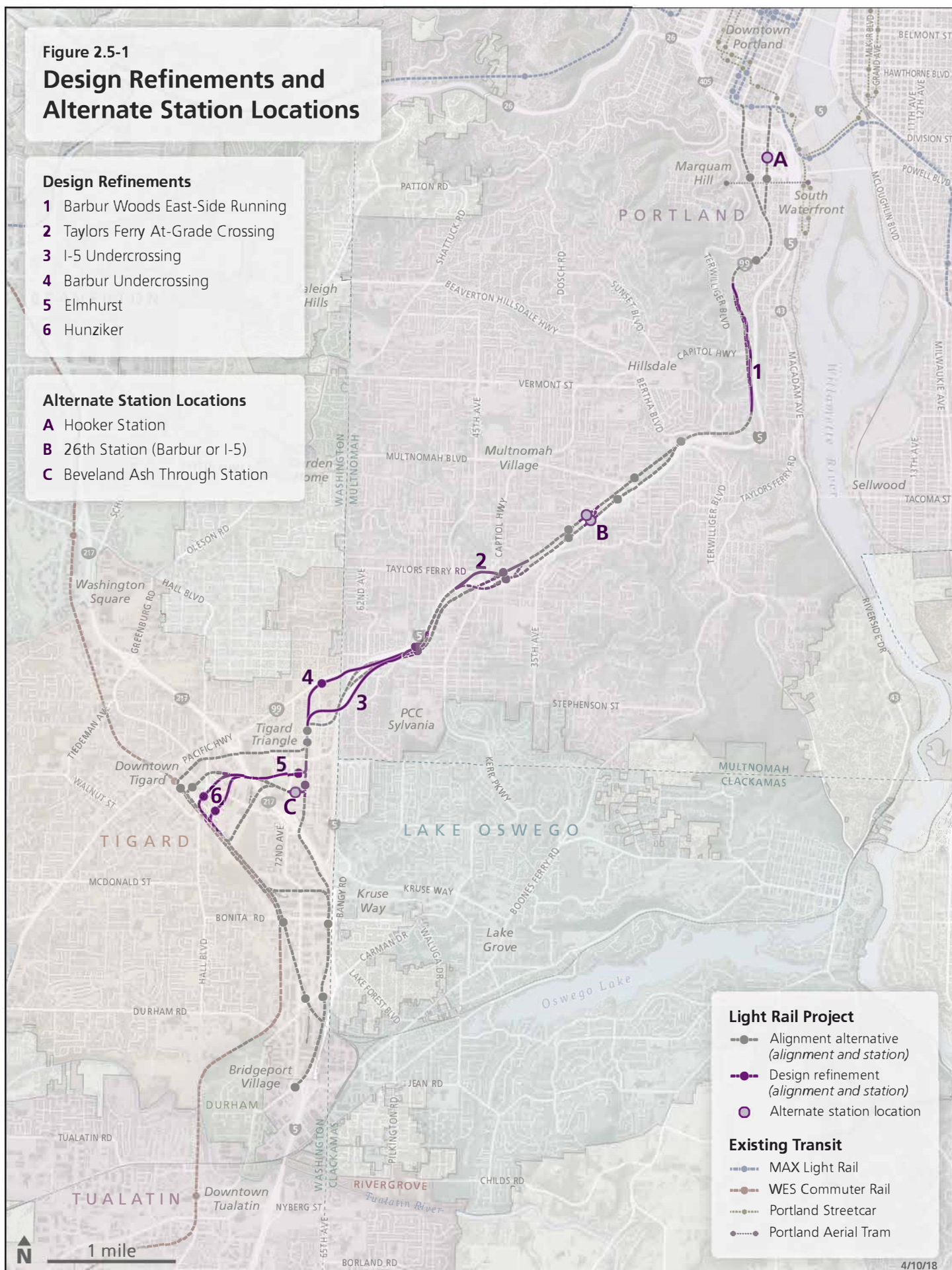




Table 2.6-1 and Figure 2.6-1 show the alignment alternatives, design refinements and additional project elements that are included in the initial route proposal. The initial route proposal is a 12-mile through-routed light rail line with 13 stations, a Marquam Hill connection, a PCC-Sylvania shuttle and an O&M facility. The initial route proposal includes up to seven park and rides with a likely range of 2,000 to 3,650 spaces. The initial route proposal would use 32 light rail vehicles operating as two-car train sets (16 sets) at headways of 7 to 15 minutes in 2035, depending on location and time of day. If there is insufficient funding to construct the entire light rail line, the MOS for the initial route proposal would terminate at the Tigard Transit Center.

**Table 2.6-1. Initial Route Proposal Overview**

Segment	Alignment Alternatives and Design Refinements <sup>1</sup>	Additional Project Elements
<b>Segment A</b>	Alternative A1: Barbur Refinement 1: Barbur Woods East-Side Running	Marquam Hill connection <sup>2</sup>
<b>Segment B</b>	Alternative B2: I-5 Barbur TC to 60th Refinement 2: Taylors Ferry I-5 Overcrossing Refinement 4: Barbur Undercrossing	PCC-Sylvania shuttle <sup>2</sup>
<b>Segment C</b>	Alternative C2: Ash to Railroad Refinement 5: Elmhurst Refinement 6: Tigard Transit Center Station East of Hall	Hunziker O&M facility

Note: O&M = operations and maintenance; PCC = Portland Community College; TC = Transit Center.

<sup>1</sup> The design refinements have not been analyzed at the same level of detail as the alignment alternatives in this Draft EIS. Design refinements would be incorporated into the Preferred Alternative in the Final EIS. Refinement 3, I-5 Undercrossing, was not selected because it was less promising than Refinement, 4 Barbur Undercrossing, which covers the same area.

<sup>2</sup> The design for the Marquam Hill connection and the PCC-Sylvania shuttle route will be selected before the Final EIS through a public process that will involve the institutions, neighborhoods and appropriate resource agencies.

The Southwest Corridor Light Rail Project will include a set of station access improvements that will be selected before the Final EIS is developed. If Alternative A1 is included in the Preferred Alternative, the Portland region will seek to fund and construct the Bridgehead Reconfiguration as a companion project.



**Figure 2.6-1**  
**Initial Route Proposal**

**Termini**

Northern end: Portland Transit Mall  
Southern end: Bridgeport

**Alignment Alternatives**

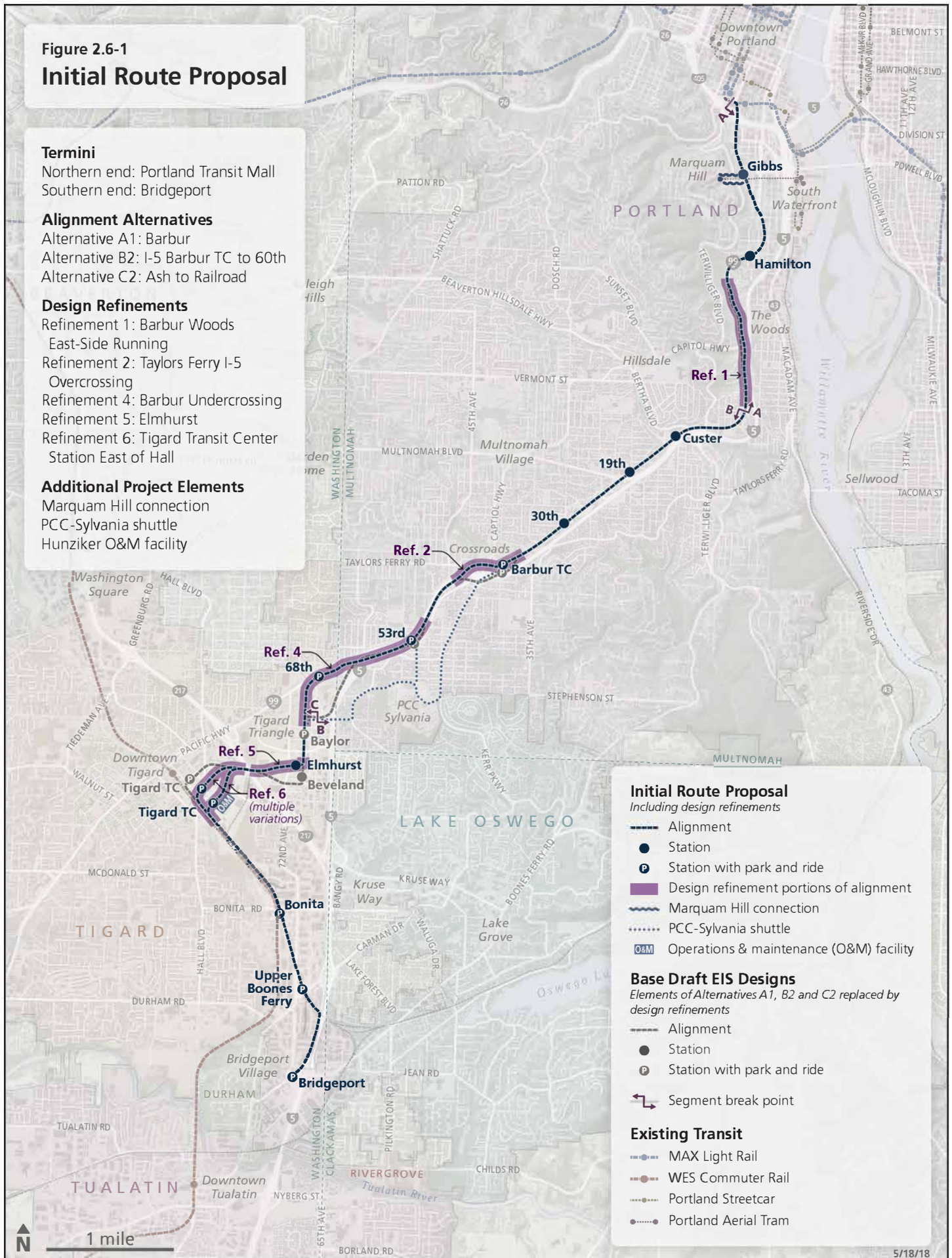
Alternative A1: Barbur  
Alternative B2: I-5 Barbur TC to 60th  
Alternative C2: Ash to Railroad

**Design Refinements**

Refinement 1: Barbur Woods  
East-Side Running  
Refinement 2: Taylors Ferry I-5  
Overcrossing  
Refinement 4: Barbur Undercrossing  
Refinement 5: Elmhurst  
Refinement 6: Tigard Transit Center  
Station East of Hall

**Additional Project Elements**

Marquam Hill connection  
PCC-Sylvania shuttle  
Hunziker O&M facility





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