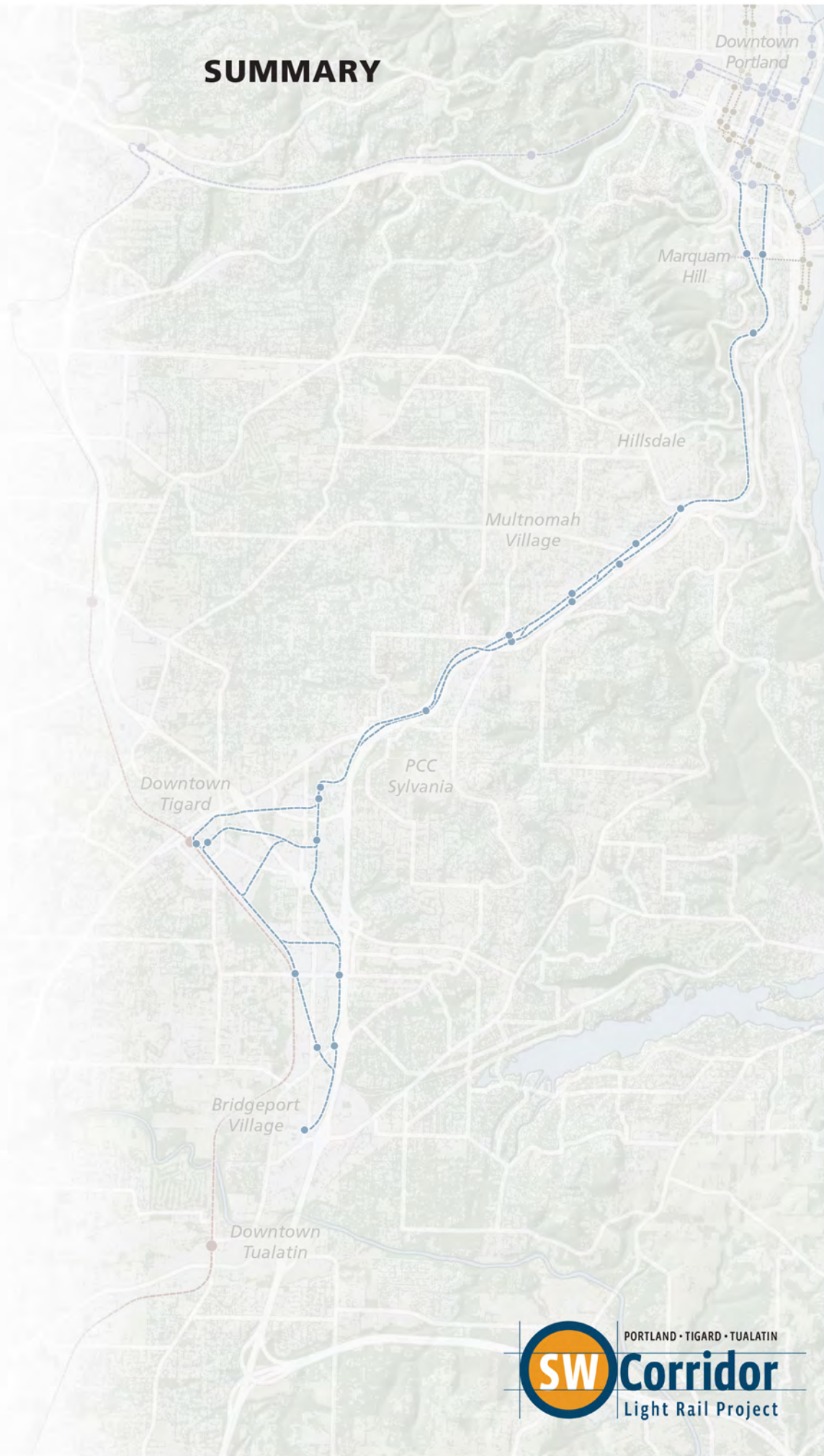


SUMMARY

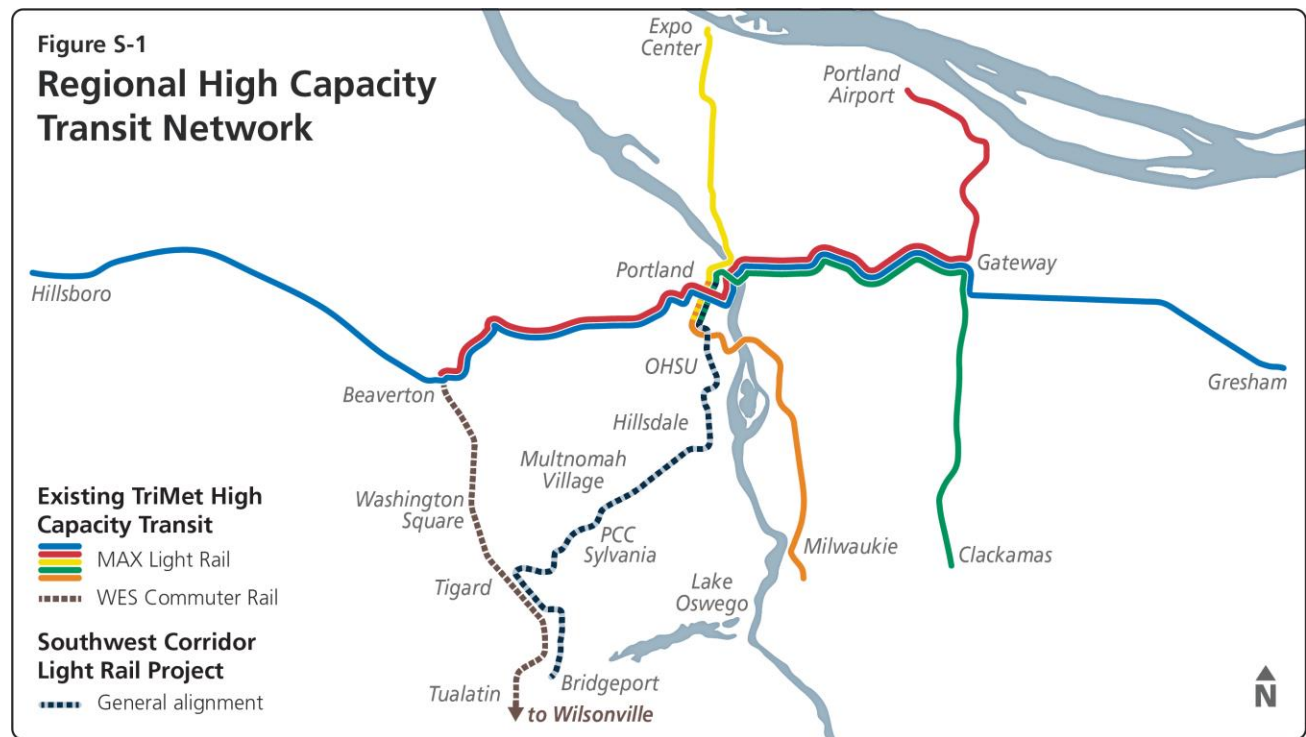


S. SUMMARY

S.1 Southwest Corridor Light Rail Project

The Southwest Corridor Light Rail Project is a proposed new 12-mile Metropolitan Area Express (MAX) line from downtown Portland through Tigard, terminating near Bridgeport Village in Tualatin. The new line would be a major new spoke in the Regional High Capacity Transit Network (see Figure S-1). It would extend the existing MAX Green Line, continuing south from the Green Line's current terminus at Portland State University (PSU) and the Downtown Portland Transit Mall. The project would serve a broader north/south travel corridor generally along Interstate 5 (I-5) and Pacific Highway (99W)/SW Barbur Boulevard from southwest Portland to Sherwood, as well as communities to the east and west.

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The proposed project would feature:

- **Light rail trackway:** 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
- **Stations and park and rides:** up to 13 light rail stations with platforms up to 200 feet long, including up to seven park and rides with up to 4,200 spaces total, and with two relocated or reconfigured transit centers and tail tracks or third tracks at terminus stations

- **Light rail vehicles:** up to 32 light rail vehicles added to the Tri-County Metropolitan Transportation District of Oregon (TriMet) fleet that would operate in two-car train sets (16 sets)
- **Light rail service:** service frequencies ranging from 7 to 15 minutes in 2035, depending on location along alignment and time of day
- **Bus routing changes:** elimination or modification of bus routes to improve coverage and service levels and avoid duplicating light rail service (service hours reallocated throughout the corridor)
- **Marquam Hill connection:** structures making a new pedestrian connection between SW Barbur Boulevard and Oregon Health & Science University (OHSU) on Marquam Hill
- **Shared transitway:** up to 2 miles of paved light rail transitway in South Portland to allow express use by buses to and from downtown
- **PCC-Sylvania shuttle:** shuttle route connecting the Portland Community College (PCC) Sylvania campus with up to two nearby light rail stations, including either five additional 40-foot buses or three van-sized shuttle buses
- **Operations and maintenance facility:** new light rail operations and maintenance (O&M) facility in Tigard with the capacity for up to 42 light rail vehicles (one facility option would have space to add more storage tracks later for up to 60 vehicles total)
- **Roadway modifications:** modifications to roadways along or intersecting the light rail alignment, such as SW Barbur Boulevard, including addition or reconstruction of bicycle lanes and sidewalks along modified roadways
- **Station access improvements:** new walking and bicycling infrastructure, such as sidewalks, bicycle lanes and paths, to improve access to stations
- **Bridgehead Reconfiguration:** modifications to the roads and ramps accessing the west end of the Ross Island Bridge and addition of signalized intersections along SW Naito Parkway (included with a certain alignment alternative)

S.2 Purpose and Need for the Project

Federal environmental regulations for an Environmental Impact Statement (EIS) require a statement of the problems a proposed project is intended to address, along with reasons why the project is needed. The Purpose and Need is used to define the EIS alternatives to be considered, and it guides the Federal Transit Administration (FTA), Metro, TriMet and their local agency partners in other decisions about the project.

The purpose of the Southwest Corridor Light Rail Project is to directly connect Tualatin, downtown Tigard, southwest Portland, and the region's central city with light rail, high quality transit and appropriate community investments in a congested corridor to improve mobility and create the conditions that will allow communities in the corridor to achieve their land use vision. Specifically, the project aims to, within the Southwest Corridor:

- provide light rail transit service that is cost-effective to build and operate with limited local resources
- serve existing transit demand and significant projected growth in ridership resulting from increases in population and employment in the corridor

- improve transit service reliability, frequency and travel times, and provide connections to existing and future transit networks including Westside Express Service (WES) Commuter Rail
- support adopted regional and local plans including the *2040 Growth Concept*, the *Barbur Concept Plan*, the *Tigard Triangle Strategic Plan* and the *Tigard Downtown Vision* to accommodate projected significant growth in population and employment
- complete and enhance multimodal transportation networks to provide safe, convenient and secure access to transit and adjacent land uses
- advance transportation projects that increase active transportation and encourage physical activity
- provide travel options that reduce overall transportation costs
- improve multimodal access to existing jobs, housing and educational opportunities, and foster opportunities for commercial development and a range of housing types adjacent to transit
- ensure benefits and impacts that promote community equity
- advance transportation projects that are sensitive to the environment, improve water and air quality, and help achieve the sustainability goals and measures in applicable state, regional and local plans

A light rail transit project in the Southwest Corridor is needed for the following reasons:

- Transit service to important destinations in the corridor is limited, and unmet demand for transit is increasing due to growth.
- Limited street connectivity and gaps in pedestrian and bicycle facilities create barriers and unsafe conditions for transit access and active transportation.
- Travel is slow and unreliable on congested roadways.
- There are both a limited supply and a limited range of housing options in the Southwest Corridor that have good access to multimodal transportation networks. In addition, jobs and services are not located near residences.
- Regional and local plans call for high capacity transit in the corridor to meet local and regional land use goals.
- State, regional and local environmental and sustainability goals require transportation investments to reduce greenhouse gas emissions.

Project Partners

Planning for the project is being led by Metro and TriMet, in partnership with the Oregon Department of Transportation (ODOT), Washington County, and the Cities of Portland, Tigard, Tualatin, Beaverton, Durham, King City and Sherwood. A leadership group of agency officials from the partners (known as the Southwest Corridor Steering Committee) has guided the study of the transit options for the Southwest Corridor since 2011.

This Draft EIS is required by the federal government under the National Environmental Policy Act of 1970 (NEPA). It discloses to decision makers and the public the substantive adverse and beneficial effects of the project and proposes ways to avoid, minimize or mitigate negative impacts. FTA is the lead federal agency for the EIS.

S.3 Alternatives Considered

This Southwest Corridor Light Rail Project Draft EIS considers a No-Build Alternative and several light rail alternatives. The No-Build Alternative represents future conditions without the proposed project. The light rail alternatives represent different ways to complete a 12-mile extension of light rail connecting downtown Portland, Oregon, to southwest Portland, downtown Tigard and Tualatin. The EIS also considers two options for a minimum operable segment (MOS), which is a shorter version of the project that could be constructed as a standalone first phase with logical termini. Exhibit S-1 describes how the light rail alternatives relate to other elements of the Southwest Corridor Plan.

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 to connect Portland, Tigard and Tualatin, and without the accompanying roadway, bicycle and pedestrian access improvements. It assumes regionally adopted forecasts for future population and employment growth through the year 2035, as well as adopted land use plans and other transportation investments in the region.

Light Rail Alternatives

Figure S-2 shows a map of the light rail alternatives for the full corridor from Portland to Tualatin. The alignment alternatives serving southwest Portland, Tigard and Tualatin would generally be within existing or new streets, or adjacent to I-5 or railroads. They comprise a total of up to 13 new stations, several with park and rides, as described below by segment. There are also options for a new light rail vehicle O&M facility, transit shuttles, interchange and circulation modifications, and new structures for pedestrians to reach Marquam Hill.

For analysis and comparison purposes, the alternatives are in three geographic segments with multiple alignment alternatives within each segment:

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

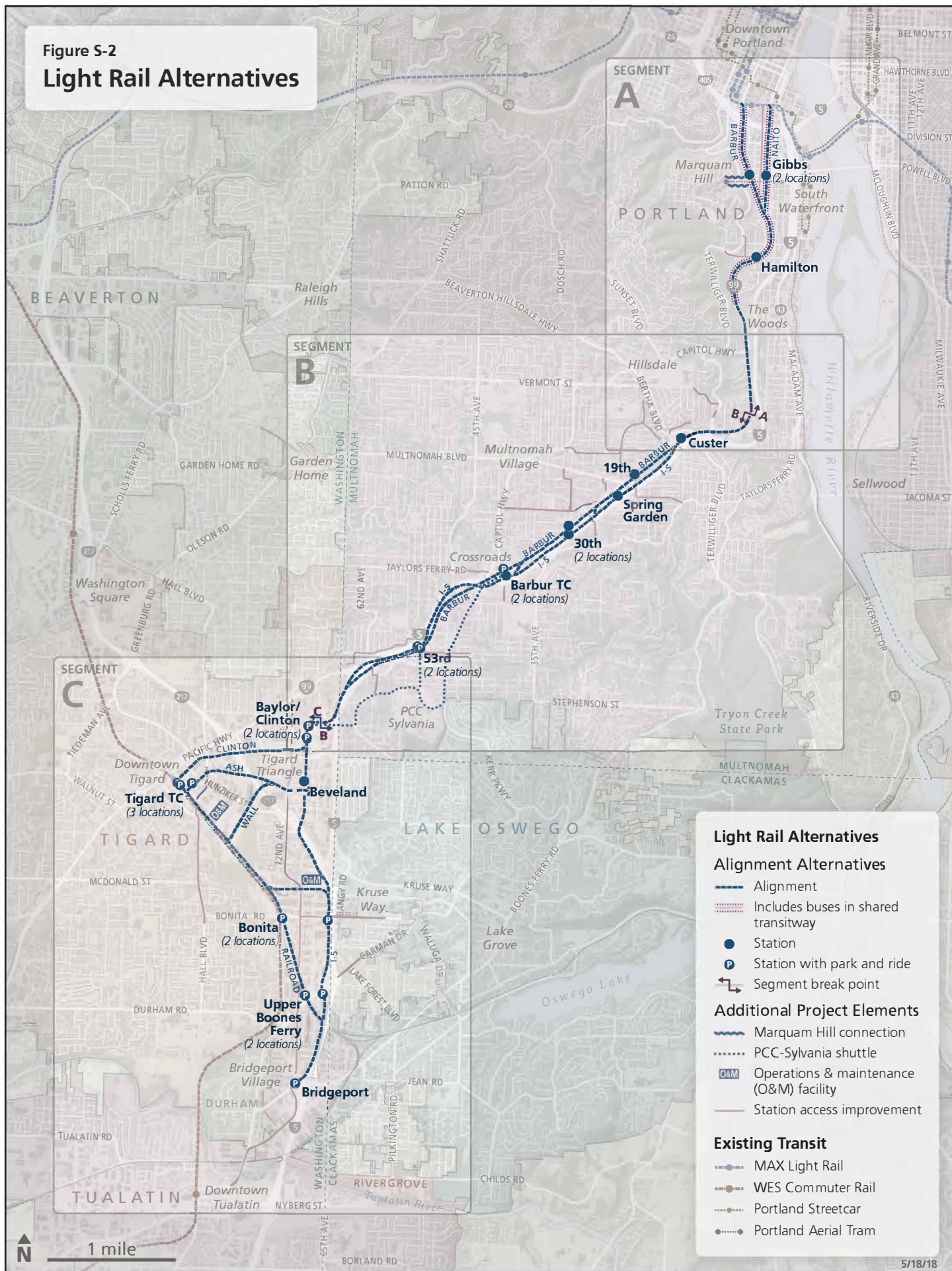
Exhibit S-1

How does the Southwest Corridor Light Rail Project relate to other Southwest Corridor Plan efforts?

The project is a major component of a broader regional effort known as the Southwest Corridor Plan, which calls for strategic investments in this fast-growing part of the Portland region. The Southwest Corridor Plan includes complementary actions to support a successful light rail project. Those initiatives are not evaluated in this Draft EIS, since they are separate projects.

The Southwest Corridor regional partners are working together to support housing, business and workforce needs by making local bus service enhancements, investing in pedestrian and bicycle facilities and regional roadways, and pursuing desired development outcomes. One example is the Ross Island Bridgehead Reconfiguration, which addresses the need to improve multimodal access in the area between Interstate 405, U.S. 26 and the Ross Island Bridge, including changes to SW Naito Parkway; that project is incorporated in one of the segment A alternatives, but could be done separately with another. The Southwest Corridor Equitable Development Strategy (supported by a Corridor-Based Transit-Oriented Development Grant from FTA) is an additional plan component, which will define actions to ensure that individuals and families can continue to live, work and thrive in the Southwest Corridor and are able to take advantage of the increased opportunities that come with the light rail project. See www.swcorridorplan.org for more details.

Figure S-2
Light Rail Alternatives



Summary Details of the Light Rail Project

As shown in Table S-1, a complete, full-corridor project would be made up of one **alignment alternative** for each segment, and it would have a new O&M facility.

Each segment includes **options** that are analyzed separately from the alignment alternatives in order to aid comparisons based on the impacts of different options. These options also would work with any of the alternatives in a given segment.

The alignment alternatives also would have options for other facilities or **station access improvements** that could be added to increase the mobility benefits of the project. Unless noted otherwise below, these options could be paired with all of the alignment alternatives in a given segment.

Table S-2 lists the key characteristics of the stations that are associated with the light rail alignment alternatives. Further details on the stations and related facilities are in Chapter 2 – Alternatives Considered.

Table S-1. Light Rail Alternatives by Segment

Alignment Alternatives	Additional Project Elements <i>(pair with all alignment alternatives unless otherwise noted)</i>
Segment A: Inner Portland	
- Alternative A1: Barbur - Alternative A2-BH: Naito with Bridgehead Reconfiguration - Alternative A2-LA: Naito with Limited Access	Marquam Hill Connection - Connection 1A: Elevator/Bridge and Path - Connection 1B: Elevator/Bridge and Recessed Path - Connection 1C: Elevator/Bridge and Tunnel - Connection 2: Full Tunnel Station Access Improvements - SA01 through SA03 (see Appendix A for detailed information)
Segment B: Outer Portland	
- Alternative B1: Barbur - Alternative B2: I-5 Barbur TC to 60th - Alternative B3: I-5 26th to 60th - Alternative B4: I-5 Custer to 60th	PCC-Sylvania Shuttle - Barbur TC and Baylor Shuttle 53rd Shuttle Station Access Improvements - SA04 through SA23 (see Appendix A for detailed information)
Segment C: Tigard and Tualatin	
Through Route - Alternative C1: Ash to I-5 - Alternative C2: Ash to Railroad - Alternative C3: Clinton to I-5 - Alternative C4: Clinton to Railroad Branched Route - Alternative C5: Ash and I-5 Branched - Alternative C6: Wall and I-5 Branched	Operations and Maintenance Facility - Hunziker Facility - Through 72nd Facility (pairs with Alternatives C1 and C3) - Branched 72nd Facility (pairs with Alternatives C5 and C6) Station Access Improvements - SA24 through SA29 (see Appendix A for detailed information)

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

Table S-2. Station Characteristics

Station Name General Location		Alignment Alternatives	Park and Ride ¹		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 (the Tigard Triangle is bounded by I-5, Highway 217 and Pacific Highway)					
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 ²					
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 at 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 at 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.

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

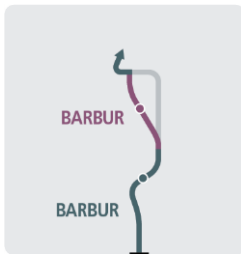
² Alternatives C3 and C4 would not include a southern Tigard Triangle station.

Segment A: Inner Portland

Segment A begins at the southern edge of downtown Portland (see Figure S-3) at the south end of the Downtown Portland Transit Mall, with three alignment alternatives that would extend light rail service from SW 5th Avenue and SW Jackson Street, near PSU, to SW Barbur Boulevard just north of SW Brier Place in southwest Portland. The alignments are either continuously along SW Barbur Boulevard, or along SW Naito Parkway and then along SW Barbur Boulevard. All of the alternatives include a 2-mile shared transitway for buses and light rail, starting at SW Barbur Boulevard near SW Capitol Highway, and extending to SW Lincoln Street.

All of the alignment alternatives carry options to build structures providing a new pedestrian connection from SW Barbur Boulevard up to the OHSU Marquam Hill complex. There are three station access improvement options in this segment that involve sidewalks and bicycle lanes.

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. Stations would be located near SW Gibbs Street and SW Hamilton Street. Both stations would use at-grade center platforms.

Alternative A2-BH: Naito with Bridgehead Reconfiguration



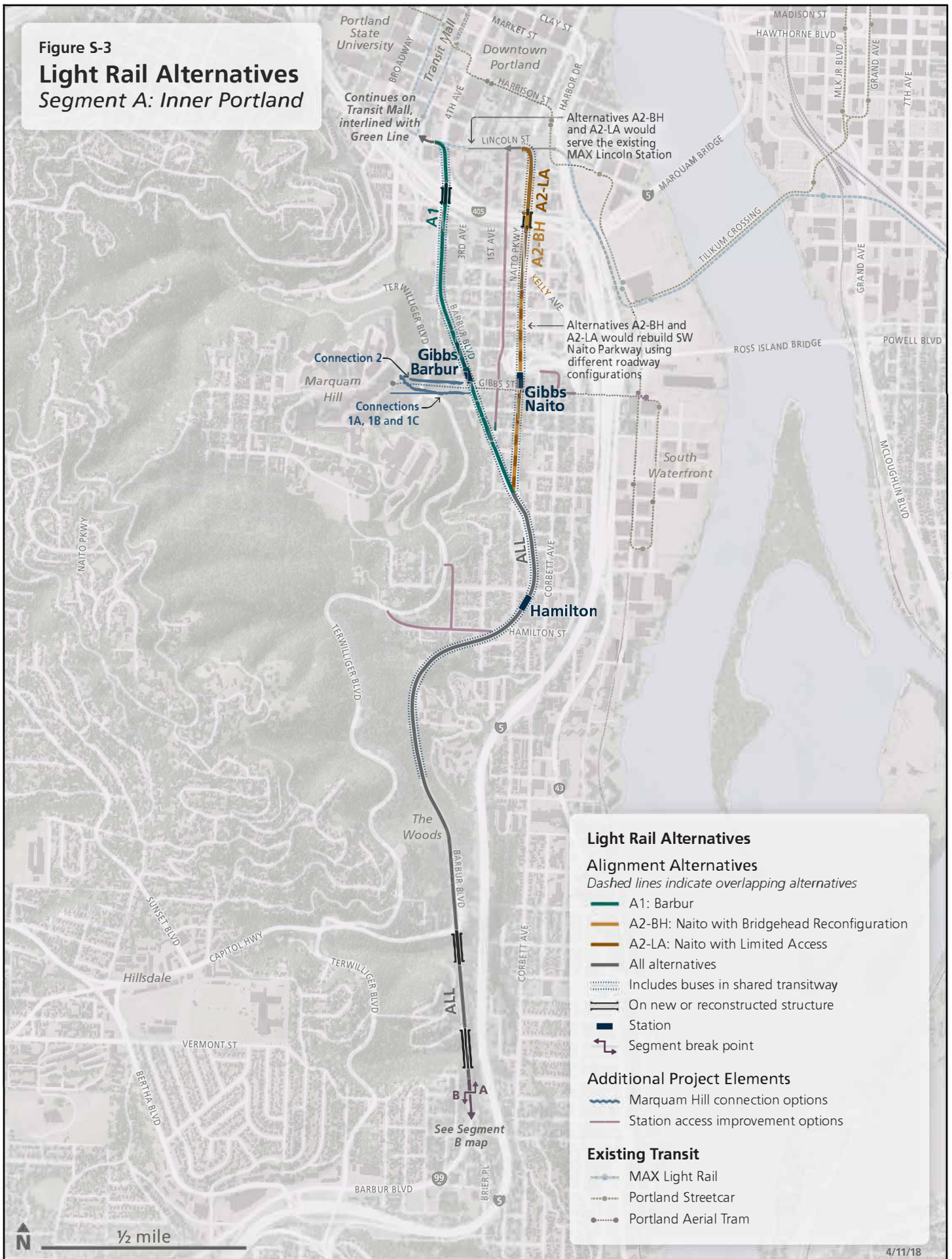
Alternative A2-BH would operate in the center of a widened SW Naito Parkway instead of on SW Barbur Boulevard until about SW Lane Street, where SW Naito Parkway connects to SW Barbur Boulevard. Alternative A2-BH would include stations on SW Naito Parkway at SW Gibbs Street, with an alternate location at SW Hooker Street, and on SW Barbur Boulevard at SW Hamilton Street.

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. As with Alternative A2-BH, it would rebuild SW Naito Parkway to accommodate center-running light rail, but it would not include the Bridgehead Reconfiguration. Instead, Alternative A2-LA would largely maintain SW Naito Parkway's current roadway access restrictions.

Figure S-3
Light Rail Alternatives
Segment A: Inner Portland



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 S-4). The light rail alternatives all have five stations and two park and rides. They all would widen SW Barbur Boulevard to accommodate light rail in the center, but they vary in how long they would stay on SW Barbur Boulevard. One of the alternatives would follow SW Barbur Boulevard through the entire segment, while three would have sections that transition to be adjacent to I-5. Segment B also has two options for a shuttle connection to the PCC-Sylvania campus, as well as 20 options for station access improvements involving sidewalks, bicycle lanes, missing street connections and pedestrian bridges.

Alternative B1: Barbur



Alternative B1 would run in the center of SW Barbur Boulevard until SW 60th Avenue. West of SW 60th Avenue, the alignment would cross back over I-5 between SW Barbur Boulevard and Tigard on a new light rail structure. Stations would be located at grade in the center of SW Barbur Boulevard at SW Custer Street, SW 19th Avenue, SW 30th Avenue, 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.

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



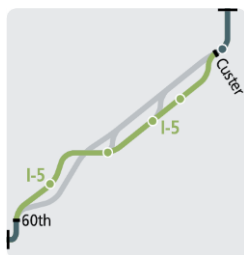
Alternative B2 would be identical to Alternative B1 from SW Brier Place to just north of the Barbur Transit Center, where light rail would transition away from the center of SW Barbur Boulevard to run adjacent to I-5. South of the Barbur Transit Center, the alignment would cross over I-5, SW Capitol 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 bridge. The stations would be the same as Alternative B1 except that the Barbur Transit Center and 53rd Stations would be located next to I-5.

Alternative B3: I-5 26th to 60th



Alternative B3 would be the same as Alternatives B1 and B2 from SW Brier Place to SW 26th Way, where it would shift to run adjacent to I-5. The alignment would depart from SW Barbur Boulevard just north of SW 26th Way and continue south along I-5 to the Barbur Transit Center. The stations would be the same as Alternative B2 except that the 30th Avenue Station would be at grade adjacent to I-5.

Alternative B4: I-5 Custer to 60th

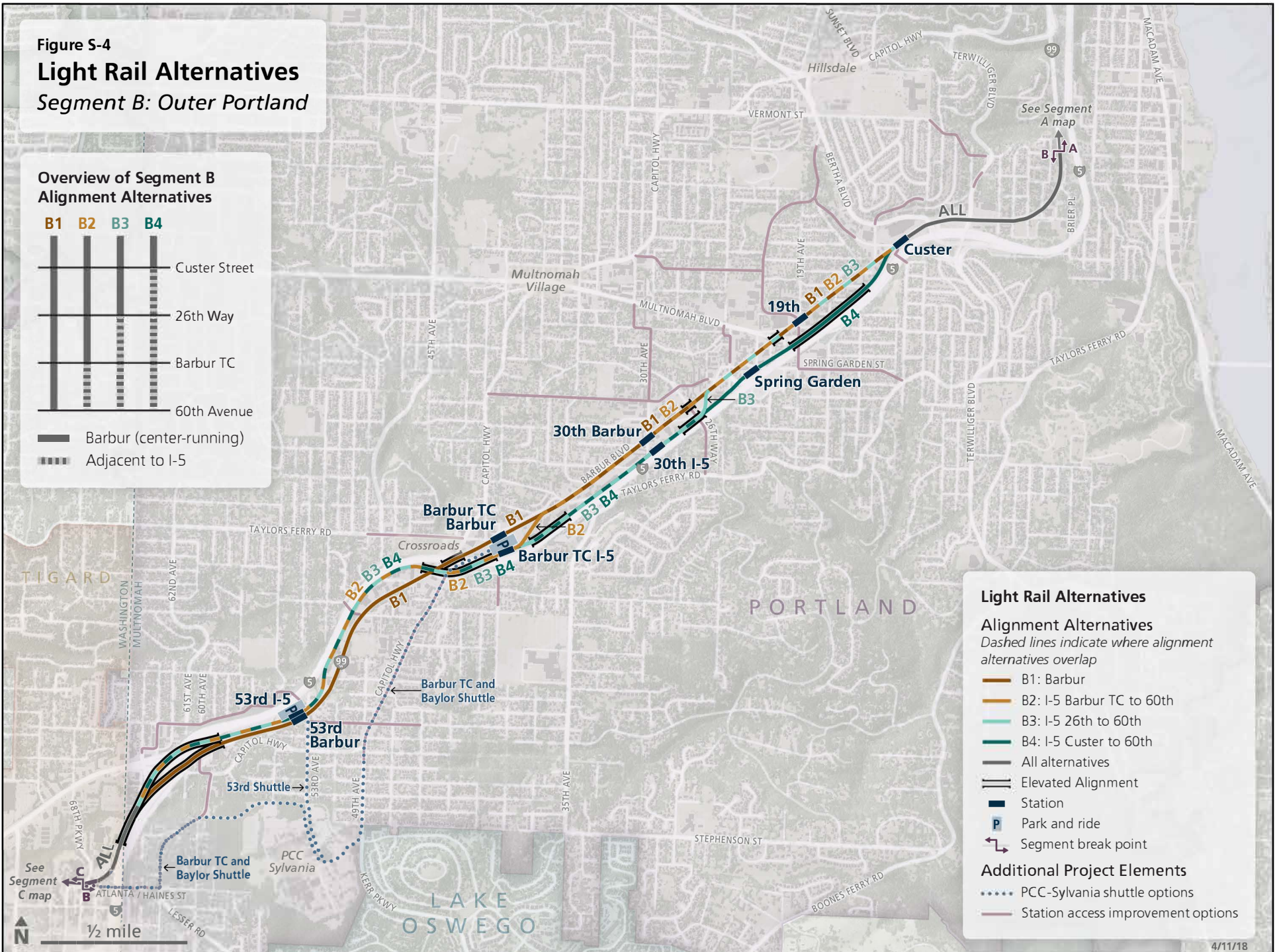
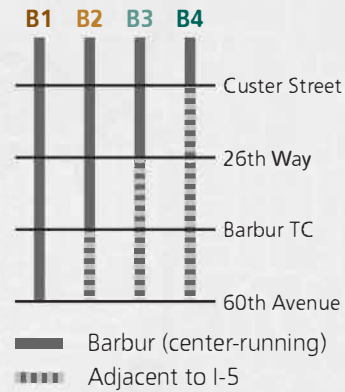


Alternative B4 runs the longest distance adjacent to I-5, starting near SW Barbur Boulevard at SW Custer Street. South of SW 26th Way, Alternative B4 would be identical to Alternative B3. The Custer Station would be the same as in Alternative B1. The 30th, Barbur Transit Center and 53rd Stations would be the same as Alternative B3. The Spring Garden Station would be at grade adjacent to I-5.

Figure S-4

Light Rail Alternatives Segment B: Outer Portland

Overview of Segment B Alignment Alternatives



Segment C: Tigard and Tualatin

This segment extends from the intersection of SW 68th Parkway and SW Atlanta Street, just west of the Portland/Tigard city boundary, to near Bridgeport Village in Tualatin, which would be the southern terminus of the light rail alignment (see Figures S-5 and S-6). It includes six alternatives with up to six stations, and the alternatives are also grouped by how they would operate. Light rail could run on a continuous “Through Route” serving Tualatin via downtown Tigard, or a “Branched Route,” with one branch going to downtown Tigard and the other branch to Tualatin. Segment C has three options for an O&M facility to support light rail operations, and six options for station access improvements for sidewalks, bicycle lanes, missing street connections and pedestrian bridges.

Alternative C1: Ash to I-5



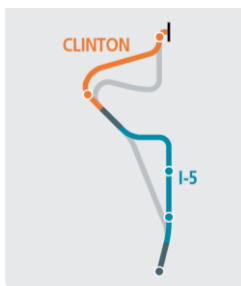
This Through-Routed alignment alternative would be along new and existing streets between the Tigard Triangle (the area bounded by I-5, Highway 217 and Pacific Highway) and downtown Tigard, and then would follow the freight rail and WES tracks before turning east to run along I-5 to Bridgeport Village. It would feature several new bridges, including a crossing over Highway 217 to reach downtown Tigard. There would be two stations in the Tigard Triangle, one with a park and ride; a station in downtown Tigard near a relocated transit center and park and ride; and stations and park and rides along I-5 at SW Bonita Road, SW Upper Boones Ferry Road and Bridgeport Village.

Alternative C2: Ash to Railroad



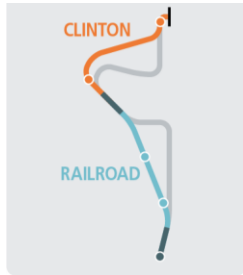
This Through-Routed alignment alternative would be identical to Alternative C1 between the Tigard Triangle and downtown Tigard, including the station locations and park and rides. It then would follow the WES Commuter Rail and freight rail tracks before transitioning to I-5 near SW Upper Boones Ferry Road and continuing to Bridgeport Village. The southern stations and park and rides would be along the freight rail tracks at SW Bonita Road and SW Upper Boones Ferry Road, and along I-5 at Bridgeport Village.

Alternative C3: Clinton to I-5



This Through-Routed alignment alternative would also be mostly along new or existing streets between the Tigard Triangle and downtown Tigard, but the alignment would be to the north of Alternatives C1 and C2 in the Tigard Triangle. Alternative C3 would have one station in the Tigard Triangle and one station in downtown Tigard, both with new park and ride structures. South of downtown Tigard, Alternative C3 would be identical to Alternative C1.

Alternative C4: Clinton to Railroad



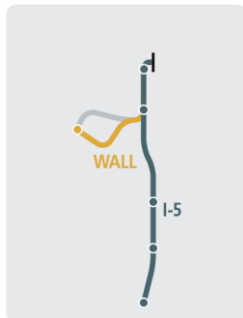
This Through-Routed alignment alternative would use the Alternative C3 alignment between the Tigard Triangle and downtown Tigard, and the Railroad alignment between downtown Tigard and Bridgeport Village. The alignment, station locations and park and rides for this alternative would be identical to Alternative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

Alternative C5: Ash and I-5 Branched



This Branched alignment alternative would use the Ash alignment for a Tigard branch, and would have a Bridgeport branch that would continue south through the Tigard Triangle to cross Highway 217 and run adjacent to I-5 to reach Bridgeport Village. North of the branch split point, which would be at the Beveland Station, the alternative would be identical to Alternative C1. The Tigard branch alignment to downtown Tigard would be similar to the alignment used for Alternative C1, and the Bridgeport branch alignment would be the same as Alternative C1 south of SW Bonita Road.

Alternative C6: Wall and I-5 Branched



This Branched alignment alternative would be similar to Alternative C5 except that it would connect to SW Wall Street west of Highway 217. 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. The Bridgeport branch 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.

Operations and Maintenance Facility Options

Two locations are being considered for a new light rail O&M facility to serve the corridor. Both are in Segment C. The “Hunziker Facility” option for an O&M facility would be at SW Hunziker Street, adjacent to the WES Commuter Rail tracks. The second location, known as the “Through 72nd Facility,” would be southeast of the Tigard Triangle between SW 72nd Avenue and I-5.

Minimum Operable Segments

A minimum operable segment (MOS) is a shorter version of the project that would be suitable to build as a first phase. An MOS must have the ability to function as a standalone project with logical termini if no other phases are built. This Draft EIS considers MOS options that terminate either at the Tigard Transit Center (for either a Through Route or a Branched Route) or at Bridgeport Village (for a Branched Route only).

Figure S-5
Light Rail Alternatives
Segment C: Tigard and Tualatin
Through Route

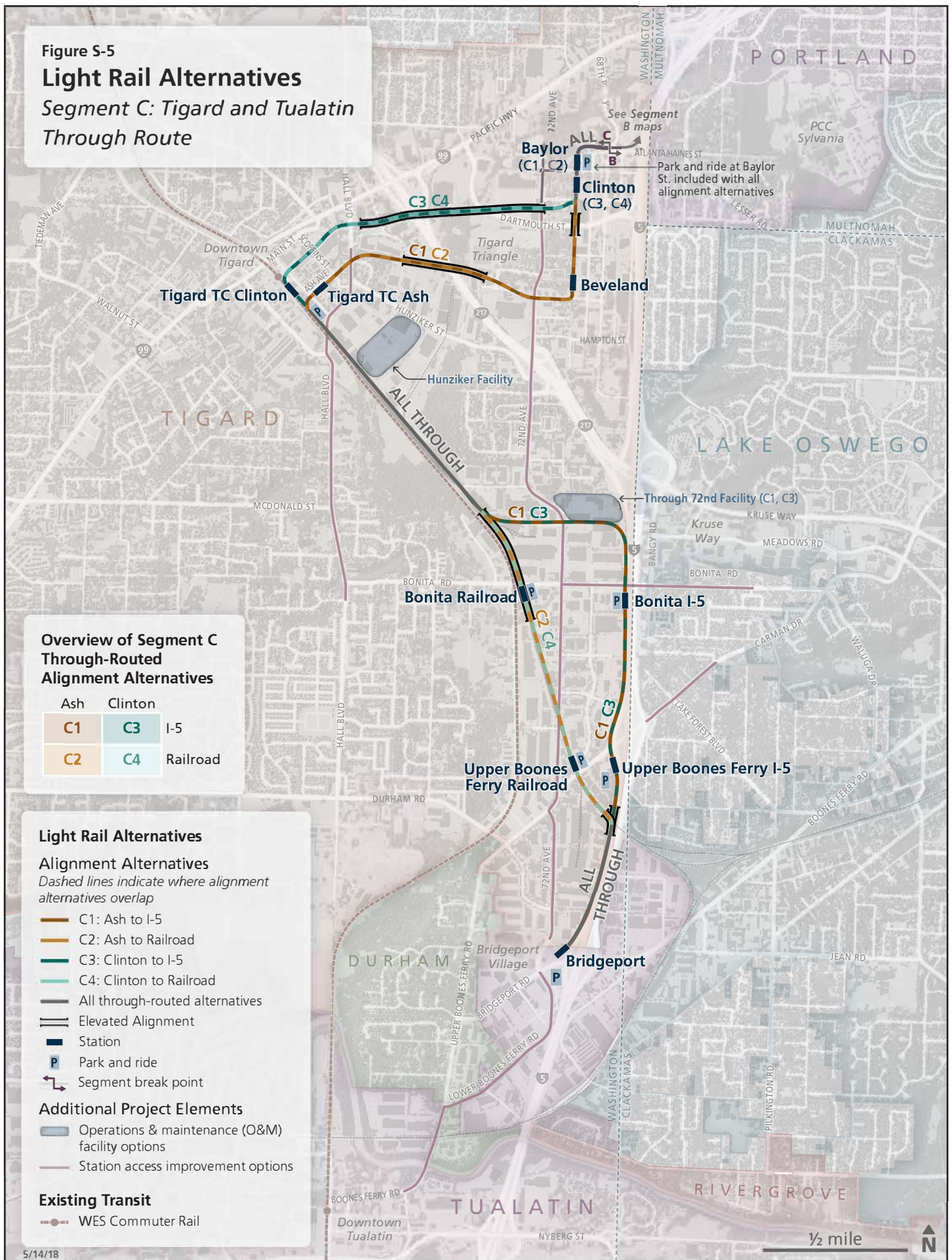
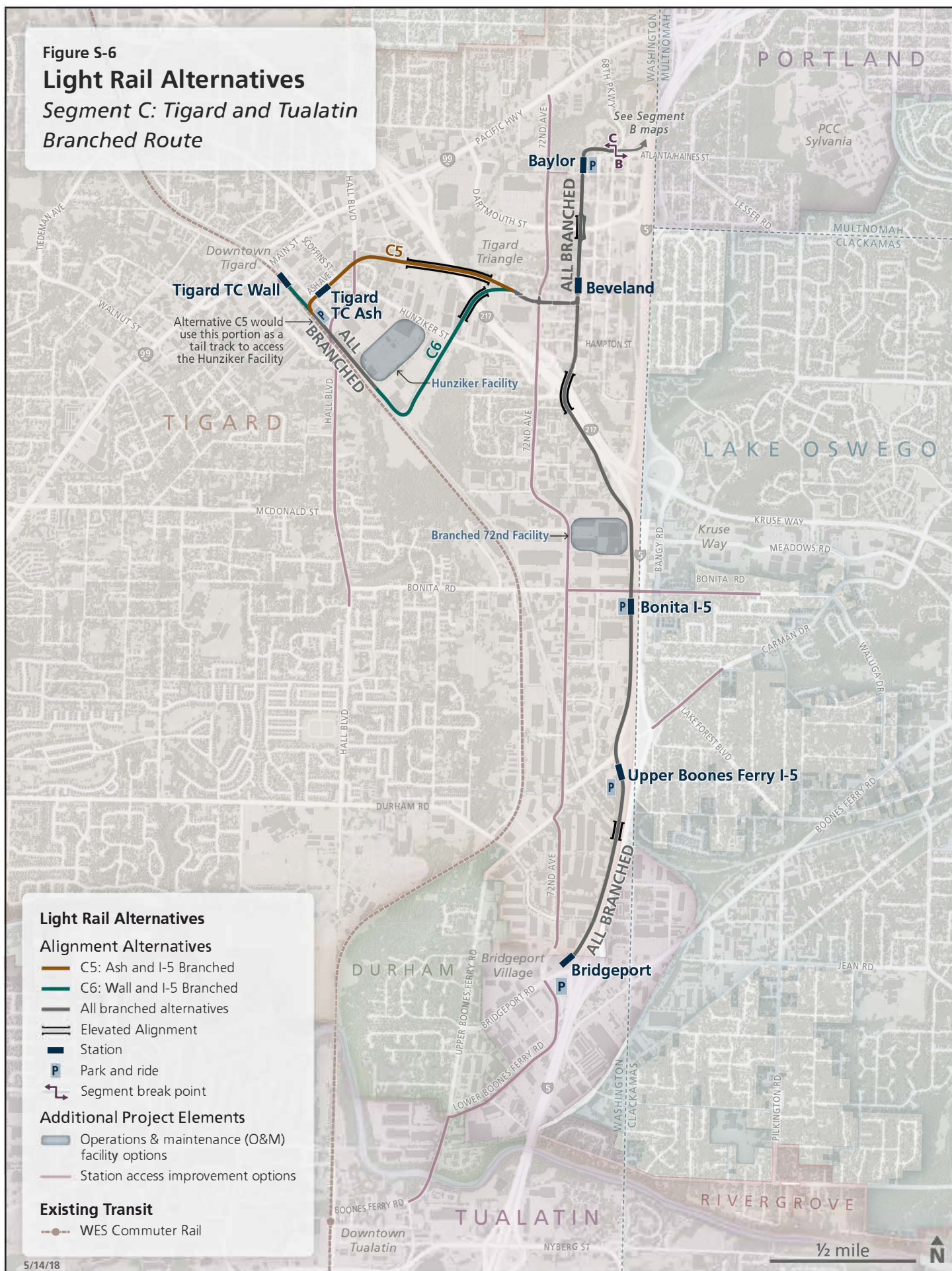


Figure S-6
Light Rail Alternatives
 Segment C: Tigard and Tualatin
 Branched Route



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. The initial route proposal was developed by project partner staff based on information from the Draft EIS analysis and on public outreach.

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 (Figure S-7 and Table S-3). The initial route proposal is based on Alternatives A1 (Barbur), B2 (I-5 Barbur Transit Center to 60th), and C2 (Ash to Railroad), with design refinements in selected areas where impacts could be reduced or benefits improved by modifying the design. 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.

The Southwest Corridor Light Rail Project will include a set of station access improvements that will be selected prior to the Final EIS. 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.

Potential Design Refinements

Based on the impact analysis conducted for this Draft EIS, TriMet, Metro and their partners developed design refinements that could be used to help avoid or reduce impacts by making design modifications, and would result in an overall improvement in project impacts, benefits and costs. These refinements are discussed in Chapter 2 – Alternatives Considered, and more detail is in Appendix E.

Construction Activities

The construction of the Southwest Corridor Light Rail Project would be a major undertaking, similar in scale, duration and complexity to other major public works projects that have been built in the region, such as the Orange Line extending light rail from downtown Portland to Milwaukie. Construction activities could begin by 2022, with major construction lasting approximately four years, followed by system testing. The phases of construction include clearing and demolition, utility relocation, development of major structures, civil and track construction, systems installation and installation of station amenities. The final phases involve testing and finish work, leading up to the opening of the line to passenger service. In addition to the areas where the project would be constructed, other areas would be needed for project staging, including for equipment and materials storage, laydown or preconstruction of some elements; field administration offices; and construction vehicle parking. The project area's major roadways, as well as I-5, would be construction haul routes.

Table S-3. Initial Route Proposal Overview

Alignment Alternatives with Design Refinements ¹	Additional Project Elements
Alternative A1: Barbur	
· Includes a design refinement for “The Woods” area along SW Barbur Blvd. that shifts the alignment to reduce historic property impacts and construction-period impacts · Shorter pedestrian connection to Marquam Hill · Faster travel time for light rail and buses in the shared transitway · Fewer displacements of residential units, businesses, employees and potentially eligible historic resources	· Marquam Hill connection²
Alternative B2: I-5 Barbur Transit Center to 60th	
· Includes design refinements for a Taylors Ferry I-5 overcrossing and a modified SW Barbur Blvd. crossing and related alignment to reduce property impacts and other impacts · More accessible station locations and greater safety improvements for all travel modes compared to Alternatives B3 and B4 · Fewer residential displacements than Alternative B4 · Avoidance of complex reconstruction of the SW Barbur Blvd./I-5 bridge at Crossroads required under Alternative B1	· PCC Sylvania- shuttle²
Alternative C2: Ash to Railroad	
· Includes refinements to the Tigard Transit Center Station with a revised alignment in the Tigard Triangle to downtown Tigard, in order to reduce property impacts and other impacts · Better support for land use development plans with two stations serving the Tigard Triangle (compared to Alternatives C3 and C4) · Avoidance of critical traffic impact at SW Hall Blvd. associated with Alternatives C3 and C4 · Fewer business and employee displacements along I-5 in southern Tigard compared to Alternatives C1, C3, C5 and C6 · More frequent service in downtown Tigard and better transit connectivity between downtown Tigard and areas to the south compared to the Branched Route (Alternatives C5 and C6)	· Hunziker O&M facility

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

¹ 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.

² The specific options for the Marquam Hill connection and the PCC-Sylvania shuttle route will be identified after the Draft EIS and before the Final EIS through a public process that will involve the institutions, neighborhoods and appropriate resource agencies.

Figure S-7 Initial Route Proposal

Termini

Northern end: Portland Transit Mall
Southern end: Bridgeport

Alignment Alternatives

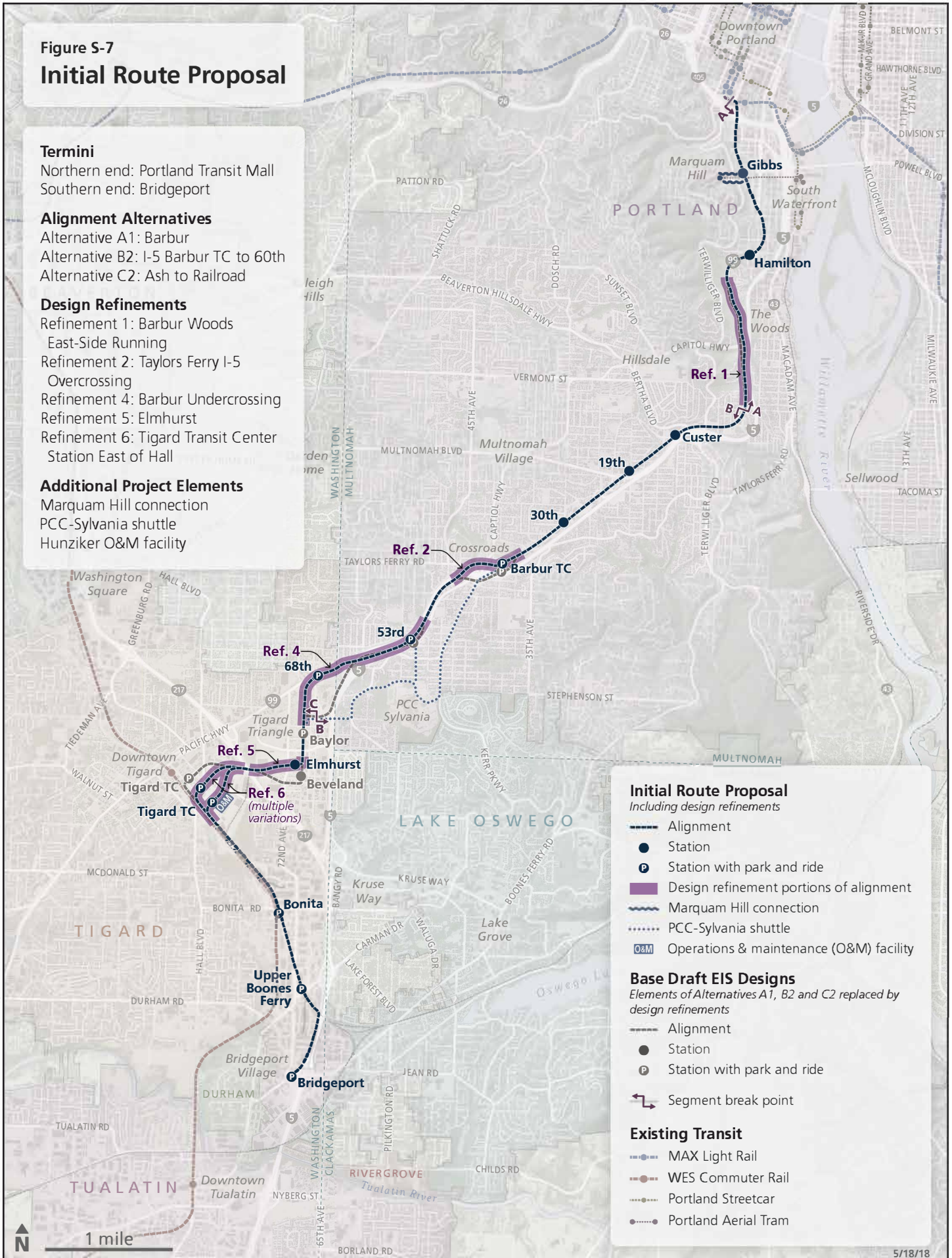
Alternative A1: Barbur
Alternative B2: I-5 Barbur TC to 60th
Alternative C2: Ash to Railroad

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



S.4 Background on Southwest Corridor Planning

Public scoping for the Southwest Corridor Light Rail Project EIS began September 2, 2016, and included a comment period that ended October 3, 2016. Public scoping was intended to encourage public and agency comments on the project's Purpose and Need, the range of alternatives being studied and the focus of the environmental analysis. During the public comment period, there were:

- two public online surveys
- five neighborhood association meetings
- an agency and tribal scoping meeting on September 20, 2016
- a public scoping meeting on September 22, 2016

The start of the EIS process for the project follows years of regional planning. In 2009, Metro adopted the 30-year *High Capacity Transit System Plan*, 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 priority. Between 2011 and 2016, Metro and its local agency partners¹ 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 and its accompanying alternatives analysis and public engagement created the framework for the Purpose and Need (Chapter 1) and the alternatives now being considered in this Draft EIS. Chapter 6 – Public Involvement and Agency Coordination has more information on public engagement efforts to date.

S.5 Transportation and Environmental Effects

Table S-4 reviews the range of environmental effects identified in this Draft EIS, highlighting where the light rail alternatives have different effects compared to the No-Build Alternative or each other. Where the differences in impacts between the individual alternatives and their need for mitigation are notable, the table shows more detail. Otherwise, it shows the general effects for all light rail alternatives. Environmental topics for which there are no clear differences and no effects requiring mitigation are not detailed in the table (Land Use, Air Quality, Energy, Utilities and Public Services).

Table S-4. Summary of Transportation and Environmental Effects (*multi-page table*)

Environmental Discipline	Impacts and Benefits
Transportation • Transit • Streets • Bicycle and Pedestrian • Parking • Freight • Safety	• Compared to the No-Build Alternative, the light rail alternatives would notably improve transit reliability and frequency • Light rail offers up to 9-minute faster in-vehicle transit travel times on full-corridor transit trips than the No-Build Alternative • Light rail would carry up to 41,600 daily light rail riders by year 2035, and the full-corridor project covers up to 8 percent more total transit riders (on bus and rail) than the No-Build Alternative • There would be increased vehicular, bicycle and pedestrian activity around transit stations and park and rides

¹ In addition to Metro, the local agency partners are the 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.

Table S-4. Summary of Transportation and Environmental Effects (*multi-page table*)

Environmental Discipline	Impacts and Benefits
	- Local and arterial intersections with congestion or queues below standards would have mitigation available to return to No-Build Alternative conditions or better - Impacts to local freight access to individual properties could create out-of-direction travel and increase travel times - Construction could temporarily reduce highway and local roadway capacity, increase truck traffic, involve sidewalk and road closures or detours, and affect access and travel times for transit
Residential Acquisitions and Displacements	- A full-corridor project would acquire and displace 78 to 293 residential units - Segment A alternatives would affect 41 to 125 residential units, with A2-LA having the highest impacts and A1 the least - Segment B alternatives would affect 32 to 78 residential units, with B4 having the highest impacts and B1 the least - Segment C alternatives would affect 5 to 85 residential units, with C1/C2 and C5 having the highest impacts and C3/C4 and C6 the least
Economics (Business Displacements)	- A full-corridor project would have acquisitions affecting 106 to 156 businesses or institutions and 961 to 1,990 employees - Segment A alternatives would have acquisitions affecting 15 to 23 businesses and 108 to 371 employees, with A2-BH and A2-LA having the highest impacts and A1 the least - Segment B alternatives would affect 54 to 66 businesses and 469 to 565 employees, with B1 affecting the fewest businesses, B2 affecting the fewest employees, and the other alignment alternatives at the higher end of the impact range - Segment C alternatives would affect 31 to 55 businesses and 323 to 839 employees; C5 would affect the most businesses, and C3 the most employees - Temporary construction impacts would involve increased traffic congestion and reroutes, noise, vibration, dust, and changes to business access and visibility
Communities	- In all segments, clusters of residential and business displacements could disrupt individual social ties and indirectly cause property values to increase through redevelopment around stations, which could affect low-income populations - In Segment A, all alternatives would affect parking for a church, but replacement parking could be provided as mitigation - In Segment C, Alternatives C1, C2 and C5 would displace a community lodge and businesses providing counseling and a medical clinic - Alternatives C3 and C4 would displace the Tigard U.S. Post Office - Alternatives C3 and C6 would displace a medical clinic - Alternatives C1, C2 and C5 (SW Ash Ave. alignments) would displace a cluster of multifamily residential buildings in the Downtown Tigard neighborhood along SW Hall Blvd. and SW Ash Ave.; the relocation of several blocks of residents would alter the current character and social interactions in this neighborhood. Improved transportation infrastructure and services for all modes could benefit area residents, businesses and patrons
Visual Quality	- Segment A alternatives would have moderate visual impacts overall, but there would be areas with higher impacts due to building and vegetation removal, such as near Marquam Hill, along SW Barbur Blvd. in The Woods, and in areas with historic properties - Segment B alternatives would have moderate visual impacts overall - Segment C alternatives would have high impacts in the Tigard Triangle and downtown Tigard due to prominent new structures, vegetation removal and removal of buildings in areas with nearby residences; Alternatives C1, C2 and C5 would have the highest visual impacts
Historic and Archaeological Resources	- A full-corridor project would have a presumed adverse effect due to full parcel acquisitions of 7 to 21 historic properties - Segment A alternatives would involve full parcel acquisitions on 5 to 15 historic properties, with A2-LA having the highest - All Segment A alternatives would impact two historic trestle bridges on SW Barbur Blvd. - Segment B alternatives would involve 2 to 5 historic properties, with B1 having the most - All of the alignment alternatives could encounter potential archaeological sites

Table S-4. Summary of Transportation and Environmental Effects (*multi-page table*)

Environmental Discipline	Impacts and Benefits
Parks and Recreation Resources	• A1 would remove vegetation bordering Duniway Park and Lair Hill Park • A2-BH and A2-LA would affect strips of land bordering Water and Gibbs Community Garden and Front and Curry Community Garden • All Segment A alternatives would remove vegetation and trees along the Terwilliger Parkway/open space along SW Barbur Blvd. and for the Marquam Hill connection, and in George Himes Natural Area Park • All Segment B alternatives would remove vegetation and trees bordering Fulton Park between the community garden and the street
Geology, Soils and Hydrogeology	• All alternatives are in a seismically active region that requires engineering measures to address the risk of damage from earthquakes • All alternatives cross areas that require measures to reduce slope instability risks
Ecosystems Resources	• A full-corridor project would involve between 1.3 and 1.6 acres of permanent wetland impacts • Tree removal in Segments A and B would affect some protected areas such as stream crossings; there would be less than 0.1 acre of permanent wetland impacts in each segment • Several stream and wetland crossings by alignment alternatives in Segment C; permanent wetland impacts would range from 0.4 acre to 1.6 acres, with C3 and C4 (Clinton) having the most
Water Resources	• There would be increased pollution-generating and non-pollution-generating impervious surfaces for all alternatives • There would be floodplain impacts for all alternatives in Segment C except C6
Noise and Vibration	• There are noise and vibration-sensitive properties, including residences, that would be impacted in all three segments • More frequent trains are needed for the Branched Route, thus creating higher noise and vibration impacts • Segment A would have up to 353 moderate noise impacts, up to 8 severe noise impacts and up to 76 vibration impacts • Segment B would have up to 147 moderate noise impacts, 1 severe noise impact and up to 29 vibration impacts • Segment C would have up to 72 moderate noise impacts, up to 15 severe noise impacts and up to 21 vibration impacts • TriMet would mitigate impacts to be below federal severe impact thresholds for all alternatives
Hazardous Materials	• A full-corridor project would acquire 5 to 8 parcels with higher risk for remaining hazardous materials for the alignment, and an O&M facility could involve 2 additional parcels; resulting cleanup would be an environmental benefit • All Segment B alternatives would acquire up to 3 parcels with higher risk for remaining hazardous materials • Segment C alternatives would acquire 2 to 5 parcels with higher risk for remaining hazardous materials, with C5 having the least
Safety and Security	• Car prowls could occur with new or expanded park and rides • Some station locations in Segment C would be in areas that currently experience property and nuisance crimes, particularly in downtown Tigard
Land Use, Air Quality, Energy, Utilities, Public Services	• No adverse long-term impacts

S.6 Effects of a Full-Corridor Alternative and Minimum Operable Segments (MOS)

A full-corridor alternative adds the effects by segment, including for the O&M facility, for an overall total for the project. Transportation effects, particularly the effects that span the full corridor or are regional in nature, such as increased transit ridership and reduced vehicle trips and miles traveled, are greatest for a full-length alternative. These regional transportation effects are generally positive.

The totals for impacts related to the conversion of land (“project footprint impacts” corresponding to property-related impacts and impacts to natural resources) are at their maximum levels with a full-corridor alternative, as shown in Table S-4.

The MOS options could either avoid or defer the impacts of converting some of the existing land uses for use by the transportation project. However, the MOS options would also have less frequent trains than a full-length alternative, which would reduce noise and vibration impacts.

A shorter project involving lower train frequencies and fewer stations would still bring transportation benefits, but these benefits would be reduced (about 9,200 fewer daily trips than a full-length alternative). Other benefits, such as improvements in air quality, would be lower, and a shorter project would have reduced consistency with regional plans for land use and the transportation system.

S.7 Other Environmental Factors

Environmental Justice

FTA has preliminarily concluded that the Southwest Corridor Light Rail Project would not result in disproportionately high and adverse effects on minority and low-income populations, after mitigation and offsetting benefits have been considered. The primary source of impacts would result from residential and business acquisitions and related displacements and relocations. For all alternatives, these impacts would be mitigated through TriMet’s real property acquisition policy, including its compensation and relocation assistance program. The number of people affected could be lowered by choosing alternatives with lower impacts, by applying design refinements that avoid or minimize impacts to properties where low-income or minority individuals are present, or by applying other mitigation or benefits to offset the impacts. After the Draft EIS public comment period concludes, FTA, Metro and TriMet will continue to identify and evaluate measures to minimize the impacts to low-income and minority populations, and they will seek additional ways to maximize benefits to help offset remaining impacts. More details are in Appendix C – Environmental Justice Compliance.

Section 4(f) and Section 6(f) of the Land and Water Conservation Fund Act

Section 4(f) is a federal regulation² that restricts FTA’s ability to approve a project that adversely affects parks and recreation resources. The Land and Water Conservation Fund (LWCF) Act authorized a federal grant program, and Section 6(f) of the Act places requirements on projects that impacts parks bought through the fund. This Draft EIS analysis has identified potential adverse impacts to historic resources in Segments A and B, as well as impacts to several parks, including the Terwilliger Parkway, which has a parcel acquired through the LWCF. Therefore, in preparing the Final EIS, FTA, Metro and TriMet will need to continue to review avoidance measures and further define mitigation, working closely with other agencies that have jurisdiction over the affected properties. These regulations, as well as the comments of other agencies with jurisdiction over affected resources, could affect the

² Section 4(f) refers to a U.S. Department of Transportation (USDOT) statute that restricts FTA’s ability to approve a project that adversely affects significant parks, recreation resources, fish and wildlife refuges, and historic properties, unless no other feasible and prudent alternative is available. Section 6(f) of the Land and Water Conservation Act requires that the conversion of lands or facilities acquired with Land and Water Conservation Act funds be coordinated with the Department of Interior. Usually replacement in kind is required.

definition of the project that advances to the Final EIS. Additional details are in Appendix D – Draft Section 4(f) Evaluation and Draft Section 6(f) of the Land and Water Conservation Fund Evaluation.

S.8 Evaluation of Alternatives

Chapter 5 – Evaluation of Alternatives evaluates the ability of the light rail alternatives to meet the project’s Purpose and Need statement, comparing the environmental, transportation and cost differences among the alternatives. While all of the light rail alternatives would meet the Purpose and Need, Chapter 5 highlights areas where the initial route proposal and its design refinements would best meet the Purpose and Need, reduce impacts, maximize benefits, and create the most cost-effective project to build and operate. Environmental effects due to property acquisitions and resulting building removals, including historic properties, as well as impacts to businesses and employees are the primary differentiating factors. There are also differences in how various alignment and station configurations affect travel times, multimodal access, constructability and construction impacts.

The chapter also covers capital and operating costs and finances, which are summarized in Table S-5 for the full corridor and MOS for both the Draft EIS alternatives and the initial route proposal with design refinements. Comparative capital costs for the alignment alternatives by segment are shown in Table S-6. Chapter 5 – Evaluation of Alternatives has more details and an illustrative finance plan.

Table S-5. Estimated Project Capital and Operating Costs

	Total Capital Cost Range ¹	Annual O&M Cost ²
Draft EIS Alternatives		
Through Route	\$3,270 to \$3,590 million	\$22 million
Branched Route	\$3,390 to \$3,630 million	\$30 million
Tigard Transit Center MOS	\$2,920 to \$3,160 million	\$19 million
Bridgeport MOS	\$2,970 to \$3,170 million	\$22 million
Initial Route Proposal (with design refinements)		
Full corridor	\$2,640 to \$2,860 million	\$22 million
MOS	\$2,170 to \$2,410 million	\$19 million

Note: MOS = minimum operable segment; O&M = operating and maintenance.

¹ Capital costs are in year-of-expenditure (2024) dollars and include finance costs.

² Operating costs assume 2035 service frequencies.

Table S-6. Capital Cost Differences Between Alignment Alternatives

Alignment Alternative	Capital Cost Difference ¹ <i>Compared to lowest cost</i>
Segment A: Inner Portland	
A1: Barbur	lowest cost
A2-BH: Naito Bridgehead	+\$140 million
A2-LA: Naito Limited Access	+\$160 million
Segment B: Outer Portland	
B1: Barbur	+\$40 million
B2: I-5 Barbur TC-60th	+\$30 million
B3: I-5 26th-60th	lowest cost
B4: I-5 Custer-60th	lowest cost
Segment C: Tigard and Tualatin	
C1: Ash-I-5	+\$60 million
C2: Ash-RR	lowest cost
C3: Clinton-I-5	+\$120 million
C4: Clinton-RR	+\$60 million
C5: Ash-I-5 Branched	+\$20 million
C6: Wall-I-5 Branched	+\$60 million

¹ Costs are in year of expenditure (2024) dollars and include finance costs.

S.9 Next Steps and the Project Timeline

The project schedule, with this Draft EIS being a major milestone, is shown on Figure S-8. A 45-day public review period of the Draft EIS begins once it is published in the Federal Register. After the close of the review period, the Southwest Corridor Steering Committee will recommend a single route—the Preferred Alternative—considering the information from this Draft EIS and comments from the public, staff and the Community Advisory Committee. The Metro Council will also consider the recommendations, the Draft EIS, and comments from the public, agencies and Tribes before adopting the Preferred Alternative.

Certain project components (Marquam Hill connection, PCC-Sylvania shuttle, and station access improvements) may not be defined in the Preferred Alternative, due to the need for further public process, but will be identified prior to development of the Final EIS. FTA, Metro and TriMet will prepare a Final EIS to respond to the substantive comments received on this Draft EIS, and state the complete Southwest Corridor Light Rail Project, environmental findings and mitigation requirements.

Once the federal environmental review concludes, the Portland region will need to identify and commit local funds to the project and request federal matching funds. Construction would take approximately four years once funding is secured.

Figure S-8

Project Schedule

