

1 PURPOSE AND NEED

1.1 Lynnwood Link Extension

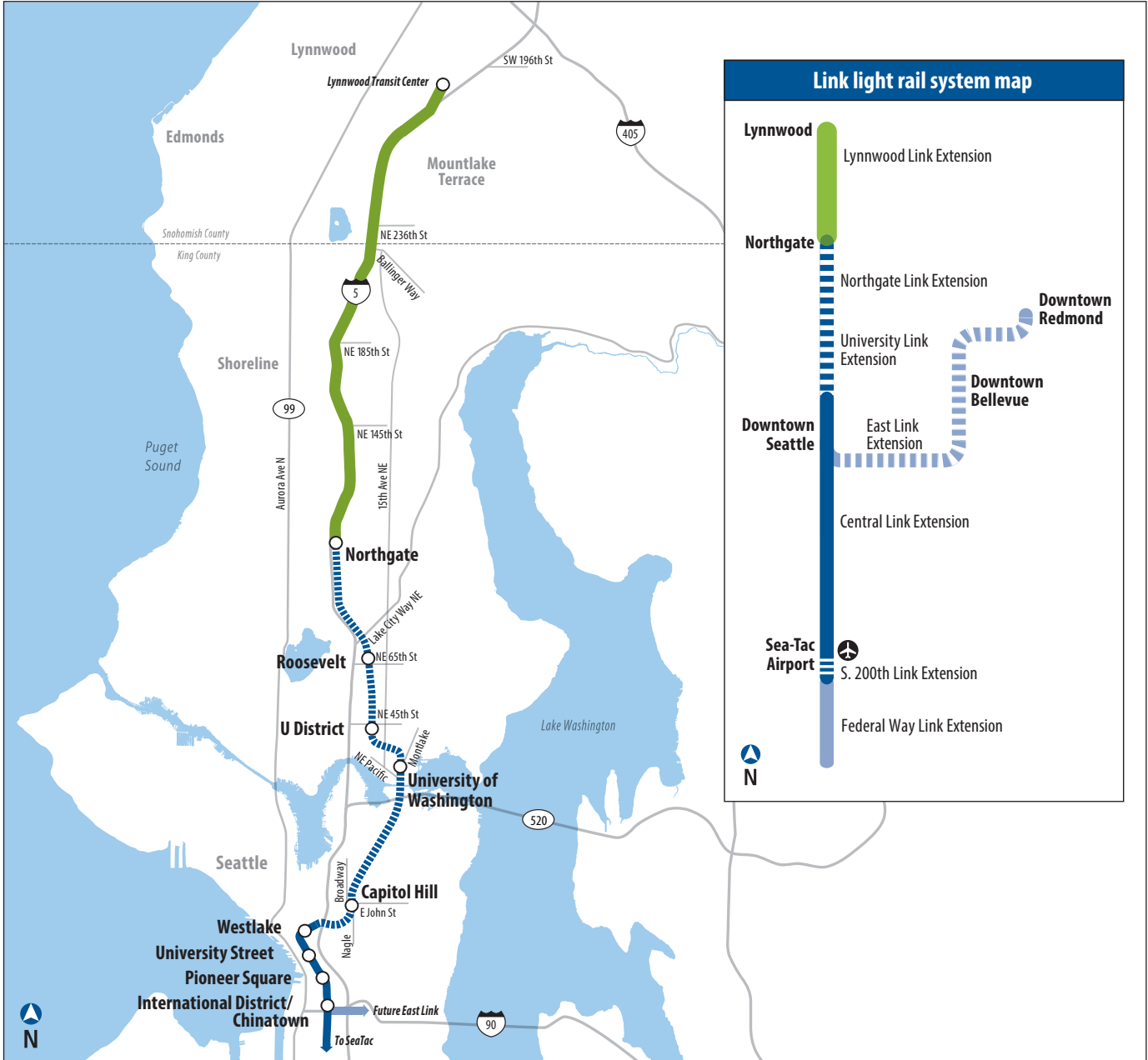
The Central Puget Sound Regional Transit Authority (Sound Transit) is proposing the Lynnwood Link Extension to expand the regional light rail system north from Northgate in Seattle to Shoreline, Mountlake Terrace, and Lynnwood in Washington State. This project was previously known as the North Corridor Transit Project, and is part of the Sound Transit 2 (ST2) program of projects.

The Lynnwood Link Extension would help implement the strategic vision for regional growth management and transportation established by the Puget Sound Regional Council's (PSRC) *VISION 2040* (PSRC 2009), *Transportation 2040* (PSRC 2010), and the *Regional Transit Long-Range Plan* (Sound Transit 2005a, 2014), all of which anticipate the eventual extension of light rail north of the city of Lynnwood to the city of Everett in Snohomish County.

Sound Transit and the Federal Transit Administration (FTA) are preparing this environmental impact statement (EIS) for the project in compliance with the National Environmental Policy Act (NEPA) and the Washington State Environmental Policy Act (SEPA). FTA is the federal lead agency for the NEPA EIS process, and Sound Transit is the state lead agency for SEPA. This chapter describes the proposed project's setting and why the project is being proposed.

1.1.1 Project Area

The proposed Lynnwood Link Extension would begin at Northgate in north Seattle and end at the Lynnwood Transit Center (Figure 1-1). The 8.5-mile project corridor generally follows Interstate 5 (I-5), the major north-south freeway through the state, and the primary route serving a large commuter market traveling between Snohomish and King counties. The project corridor travels through the cities of Seattle and Shoreline in King County, and Mountlake Terrace and Lynnwood in Snohomish County. This is one of the most densely developed urbanized areas in the Pacific Northwest and is part of a longer north-south corridor connecting Olympia, Tacoma, Seattle, and Everett. Each year population and employment grow in these corridor communities. Roadways in this corridor experience high levels of congestion throughout large portions of the day, which degrades mobility and reliability. The corridor is one of the region's most productive markets for transit, and there have been major investments in public transit infrastructure and service over the past 40 years.



DATA SOURCES: (Sound Transit)

Legend

- Lynnwood Link Extension
- Under construction
- Link in service
- In planning
- In design

Figure 1-1
Regional Setting for
the Lynnwood Link Extension

With *Sound Move*, the first set of required mass transit investments, Sound Transit began light rail service in 2009 with Central Link, which launched a system that now runs 13.9 miles between downtown Seattle and Seattle-Tacoma International Airport (Sea-Tac Airport). Construction currently underway will extend light rail by 3 miles from downtown Seattle to the University of Washington by 2016, and another 4.3 miles from the University of Washington to Northgate by 2021 (Figure 1-1). With the Lynnwood Link Extension and the other projects in the ST2 program, Sound Transit is developing nearly 36 miles of new service to the north, south, and east. The combined *Sound Move* and ST2 programs will complete nearly 55 miles of light rail to serve the Puget Sound region. The ST2 program defined the Lynnwood Link Extension as light rail extending from the Northgate Transit Center to the Lynnwood Transit Center, with intermediate stations serving north Seattle, Shoreline, and Mountlake Terrace.

1.1.2 Corridor Communities

The project corridor is home to established communities that are redeveloping and increasing in density. The compact nature of these communities is reinforced by the geographic constraints of Puget Sound and Lake Washington on either side of the corridor. Everett is to the north, and Seattle, the state's largest population and employment center, is to the south. Land use in the project corridor is largely residential but is anchored by major regional commercial centers at Northgate and Lynnwood, with town centers and other activity centers located in between. As of the 2010 United States Census, nearly 126,000 people lived within 0.5 mile of the project corridor in Seattle, Shoreline, Mountlake Terrace, and Lynnwood; for the same period, PSRC estimated nearly 60,000 jobs were within the corridor. The total population and employment in each of these cities is even higher: 720,000 people and 565,000 jobs as of 2010.

Regional and local plans anticipate high levels of growth in the corridor communities through 2040. Population during this period is predicted to grow 20 percent and employment 40 percent by 2040. While the number of jobs will grow in the corridor, mostly at the Northgate and Lynnwood urban centers, many residents in the corridor will also commute to jobs in other rapidly growing urban centers to the south in Seattle and in east King County cities such as Bellevue and Redmond.

1.2 Purpose and Need for the Lynnwood Link Extension

In 2010, Sound Transit developed a preliminary Purpose and Need Statement as part of an Alternatives Analysis and early scoping process for the proposed project. Following public and agency review, the preliminary statement was revised based on comments received. When this EIS was initiated with environmental scoping and another public comment period in September and October 2011, Sound Transit again invited public comment on the Purpose and Need Statement. Finally, the

Draft EIS issued on July 26, 2013, gave another opportunity for review and comment on the Purpose and Need. The resulting Purpose and Need Statement reflects public and agency comments and is consistent with the direction of the Sound Transit Board of Directors in late 2011 and early 2012. This included the Board's adoption of Motion M2011-87, which incorporated the results of the Alternatives Analysis, and confirmed light rail as the high-capacity transit mode for the Lynnwood Link Extension. As Chapter 2, Alternatives Considered, further describes, the Alternatives Analysis concluded that light rail in an exclusive right-of-way is the only mode that can address the corridor's growing mobility, access, and capacity needs.

1.2.1 Purpose of the Project

The purpose of the Lynnwood Link Extension is to expand the Sound Transit Link light rail system from Northgate in Seattle north into Shoreline, Mountlake Terrace, and Lynnwood in Snohomish County in order to:

- Provide reliable, rapid, and efficient peak and off-peak two-way transit service of sufficient capacity to meet the existing and projected demand for travel to and from the corridor communities and other urban centers in the Central Puget Sound area.
- Create an alternative to travel on congested roadways, and improve connections to the regional multimodal transportation system.
- Support the adopted land use, transportation, and economic development plans of the region and the corridor communities.
- Advance the long-range vision, goals, and objectives for transit service established by the Sound Transit Long-Range Plan for high-quality regional transit service connecting major activity centers in King, Pierce, and Snohomish counties.
- Implement a financially feasible system that seeks to preserve and promote a healthy environment.

1.2.2 Need for the Project

The project is needed to:

- Address increasingly unreliable travel times for transit trips that now rely on the corridor's highly congested roadways and high-occupancy vehicle (HOV) lanes.
- Address overcrowding caused by insufficient transit capacity.

- Create a reliable alternative to automobile trips on I-5 and State Route (SR) 99, the two primary highways serving the project corridor, which are unreliable and over capacity throughout large portions of the day.
- Increase mobility, access, and transportation capacity for the 20 percent growth in population and 40 percent growth in employment projected in the regional growth and activity centers in the corridor and the region, consistent with PSRC's *VISION 2040* and *Transportation 2040*, as well as related county and city comprehensive plans.
- Create the transit infrastructure needed to support the development of Northgate and Lynnwood—the corridor's two designated regional growth centers.
- Advance the Sound Transit Long-Range Plan for a future extension of mass transit north to Everett.
- Ensure long-term regional mobility, multimodal connectivity, and convenience for the corridor's citizens and communities, which include travel-disadvantaged residents and low-income and minority populations.
- Help the state and region reduce transportation-related energy consumption and reduce harmful greenhouse gas emissions in the atmosphere, in accordance with state laws.

1.3 Planning History for Lynnwood Link Extension

Many years of planning and past investments have focused on the need for effective regional transit serving this corridor's communities. Transit shaped the original development of the communities beginning in 1910, when the Interurban railway began operating between Seattle and Everett. However, transit service faltered in the 1950s when the Interurban stopped running. The "Forward Thrust" regional transit system proposals of the late 1960s and early 1970s included fixed guideway transit along the I-5 corridor in King County, but funding was defeated at the polls. Since then, a largely commuter-oriented transit system comprising express bus infrastructure and services has developed to serve rapid population and employment growth along the I-5 corridor, helping to connect Snohomish County suburban residents to jobs in Seattle. Express bus investments have included HOV lanes, park-and-ride facilities, transit centers, direct access ramps, and freeway transit stations.

The region renewed its efforts to develop mass transit service connecting Seattle and Snohomish County in the 1990s. In 1993, the Central Puget Sound Regional Transit Authority (Sound Transit) was created, and in 1995 the Lynnwood Link Extension project corridor was part of a large proposal for developing regional light rail connecting King, Pierce, and Snohomish counties; however, the voters did not

approve that program. The following year, voters approved financing for a scaled-back program known as *Sound Move* that included light rail in King County, improved regional express bus services, commuter rail, and related facilities. Sound Transit defined a second phase of investments after completing a Long-Range Plan Update in 2005, and the resulting ST2 program was approved by voters in 2008.

Chapter 2, Alternatives Considered, describes the more recent steps in this project's planning, including an Alternatives Analysis Sound Transit conducted starting in 2010, and the agency's continued planning and design efforts for this EIS.

1.3.1 Regional Plans for Managing Growth and Transportation

The Puget Sound region, which encompasses urbanized King, Pierce, Snohomish, and Kitsap counties, has a coordinated series of regional, county, and local plans and policies that guide how the region is managing its growth. Many of these plans have directly shaped the development of the Lynnwood Link Extension.

Federal legislation for federal transportation programs strongly emphasizes the importance of linking regional and related transportation planning decisions with individual project decisions. The Moving Ahead for Progress in the 21st Century Act (MAP-21) re-emphasized the need for local agencies to integrate their local plans into the NEPA process.

The primary regional land use and transportation plans relevant to the Lynnwood Link Extension are PSRC's *VISION 2040* (PSRC 2008) and *Transportation 2040* (PSRC 2010a). The Sound Transit Long-Range Plan serves as the regional transit element of *Transportation 2040*. These plans share land use, growth management, and transportation policies that call for an effective regional transit system to link the urban centers where the region's growth will be focused. County and local city comprehensive plan policies in the project corridor and throughout the region reinforce the need for high-capacity transit investments to support new population and employment developments, as well as to provide for vibrant urban communities that offer alternatives to automobiles.

VISION 2040

VISION 2040, which PSRC amended in 2009, is the region's integrated, long-range vision for accommodating the approximately 5 million people expected to live in the Puget Sound region by 2040. Its goals are to maintain a healthy region, promote the well-being of people and communities, ensure economic vitality, and preserve a healthy environment. Northgate and Lynnwood are both designated as regional growth centers in *VISION 2040*, and the Lynnwood Link Extension would connect these growth centers.

Transportation 2040

Transportation 2040, which was adopted by PSRC in May 2010 and amended in 2012 and 2014 with new forecasts and projects, is the region's metropolitan transportation plan and one of the key action plans to implement the *VISION 2040* strategy over the next 30 years. The region's growth in jobs and population is expected to boost demand for travel within and through the region by about 40 percent. *Transportation 2040* outlines a long-term program for regional transportation investments, including the Lynnwood Link Extension, to address rising travel demand.

Regional Transit Long-Range Plan and ST2

The Regional Transit Long-Range Plan outlines Sound Transit's vision for a high-capacity transit system serving the urban areas of Snohomish, King, and Pierce counties. The plan identifies corridors for light rail, commuter rail, regional express bus, and bus rapid transit services. The Lynnwood Link Extension is part of the Seattle-to-Everett corridor for high-capacity transit. The 2005 plan update led to the ST2 program of projects, which included a light rail extension from Northgate to Lynnwood. The Lynnwood Link Extension is also included in the 2014 update to the Regional Transit Long-Range Plan.

1.3.2 Regional and Local Transportation Systems

Regional Highways

The project corridor encompasses I-5—one of the two primary north-south highways between Lake Washington and Puget Sound. I-5 is the most heavily traveled highway in the state, serving regional and interstate movements of both people and goods, carrying from 159,000 to 196,000 vehicles in the project corridor on an average day (WSDOT 2011). In addition to I-5, SR 99 provides a north-south connection; several other state highways, including SR 104 and SR 523, provide important east-west connections.

The Washington State Department of Transportation (WSDOT) time-reliability calculator¹ indicates that a trip from Lynnwood to Seattle at free-flow speeds should take about 15 minutes on I-5. Because of the high levels of congestion and unpredictable delays, a commuter must allow up to 55 minutes for the trip during the AM peak period to ensure arriving on time 95 percent of the time. Physical and environmental constraints limit the addition of more highway capacity in the project corridor. Regional transportation planners expect the current high levels of travel demand to continue growing, and congestion and unreliability for travelers on I-5 to increase through 2040 (PSRC 2014).

¹ WSDOT 95% Reliable Travel Times calculator:
<http://www.wsdot.com/traffic/Seattle/TravelTimes/reliability/default.aspx>

Transit

The project corridor has an extensive network of bus routes, most of which run generally north and south. Much of the project corridor's transit demand is fueled by commuters from north King County and south Snohomish County heading for downtown Seattle and the University District—two major employment centers in the region. Thirty-six weekday bus routes provided by three transit agencies operate through the project corridor along I-5. Most are peak-period, peak-direction, point-to-point routes linking south Snohomish County, north King County neighborhoods, and park-and-ride lots to major employment centers in King County. The project corridor carries the second highest bus ridership volumes in the region, with over 19,000 daily riders in 2011.

Delays on I-5 affect travel times and reliability because HOV lanes are not continuous south of Northgate. Slow traffic in the general purpose lanes slows travel in the HOV lanes as well. This makes transit travel particularly unreliable and lengthy during the morning and evening peak periods when most transit use occurs. The I-5 HOV lanes in the project corridor do not meet the WSDOT policy standard for average HOV lane speeds of 45 miles per hour (mph) or greater at least 90 percent of the time during the morning and afternoon rush hours (WSDOT 2014).

1.4 Applying the Purpose and Need to the Project

The Purpose and Need Statement helped Sound Transit identify the EIS alternatives described in Chapter 2, Alternatives Considered. Chapter 5, Evaluation of Alternatives, describes how Sound Transit and FTA have measured the alternatives' ability to serve the purpose and need, along with comparisons of other factors such as environmental impacts, costs, and constructability.

2 ALTERNATIVES CONSIDERED

This Final EIS evaluates a Preferred Alternative for the Lynnwood Link Extension, other light rail alternatives, and a No Build Alternative. The light rail project would be 8.5 miles long, starting at the Northgate neighborhood of Seattle and continuing north to the cities of Shoreline, Mountlake Terrace, and Lynnwood.

The Lynnwood Link Extension would directly connect to the northern terminus of the Link light rail system at Northgate. From there, riders could continue south on the Link system to the University of Washington, Capitol Hill, downtown Seattle, Rainier Valley, Tukwila, SeaTac, and Sea-Tac Airport. Separate projects to extend light rail to the south and east will allow direct connections to Bellevue, Redmond, and Federal Way.

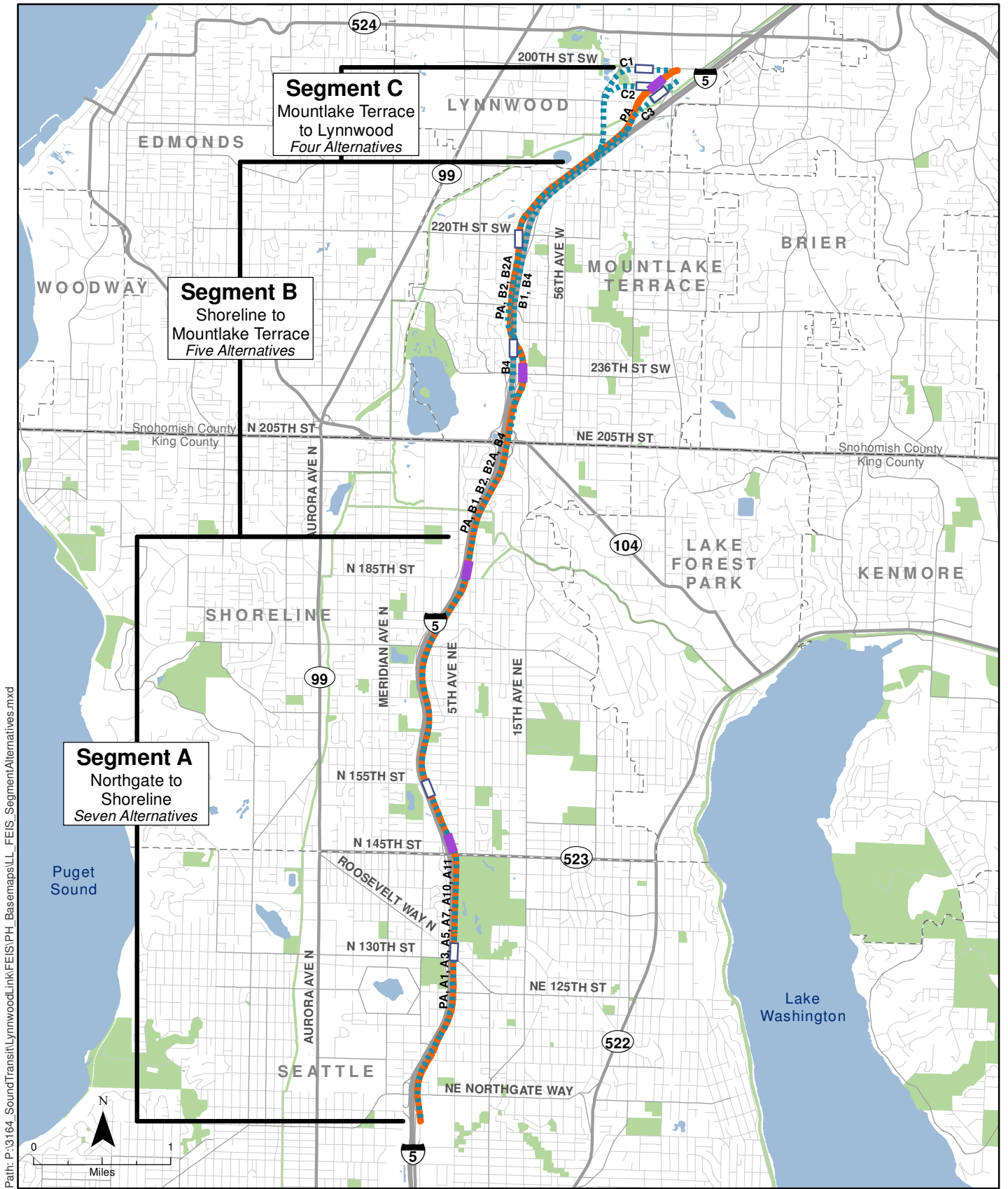
In 2010, Sound Transit started detailed project-level planning to produce the alternatives considered in this EIS. Section 2.6, Alternatives Development, describes the steps Sound Transit and FTA took to work with the public, tribes, and agencies to consider the range of alternatives during the Alternatives Analysis process. A comparative evaluation of the alternatives is in Chapter 5, Evaluation of Alternatives.

Sound Transit and FTA published a Draft EIS for the project, followed by a 60-day comment period. The Sound Transit Board then reviewed the alternatives, the Draft EIS, and the public comments before approving Motion M2013-96, identifying a Preferred Alternative, and directing staff to further evaluate potential modifications and options for the Preferred Alternative and other alternatives in the Final EIS.

2.1 Light Rail Alternatives

This Final EIS evaluates a range of light rail alignments and stations generally following I-5 from the Northgate Transit Center in Seattle to the Lynnwood Transit Center. The Preferred Alternative and the other alternatives are analyzed in three geographic segments, as shown in Figure 2-1.

Segment A: Northgate to Shoreline. There are seven Segment A alternatives between Northgate in Seattle and NE 185th Street in Shoreline, all on the east side of I-5. They include at-grade and elevated alignments, each with two or three stations, some of which would include park-and-ride facilities. The potential station sites are at NE 130th Street, NE 145th Street, NE 155th Street, and NE 185th Street.



Path: P:\3164_SoundTransit\LynnwoodLink\FEIS\PH_Basemaps\LL_FEIS_SegmentAlternatives.mxd

Data Sources: (King County, Snohomish County, WSDOT, Sound Transit)

- Preferred Alternative (PA)
- Preferred Alternative Station Location
- Other Light Rail Alternatives
- Other Alternative Station Location
- Preferred Alternative and Other Alternatives

- Roadway
- Local Street
- City Boundary
- County Boundary

- Park
- Waterbody

Note:
Each segment alternative can be matched to any adjacent segment alternative.

Figure 2-1
Alternatives by Segment

Lynnwood Link Extension

Segment B: Shoreline to Mountlake Terrace. There are four Segment B alternatives between NE 185th Street in Shoreline and 212th Street SW in Mountlake Terrace. Each alternative begins on the east side of I-5 and ends either in the I-5 median or on the west side of I-5. These alternatives feature one or two stations with park-and-ride facilities, including a station serving the existing Mountlake Terrace Transit Center (236th Street SW) and potentially an additional station at 220th Street SW.

Segment C: Mountlake Terrace to Lynnwood. Segment C has four alternative routes for departing from the I-5 median or west side of I-5 to end at a northern terminus station, with park-and-ride facilities at or near the existing Lynnwood Transit Center at 200th Street SW.

2.2 The Preferred Alternative

With Motion M2013-96, the Sound Transit Board identified the Preferred Alternative for evaluation in the Final EIS, based on the analysis in the Draft EIS and public and agency comments.

2.2.1 Segment A

The Preferred Alternative identified for Segment A is similar to Alternative A1, which is an at-grade/elevated alignment with NE 145th and NE 185th Street Stations, but modified by shifting the guideway east of 1st Avenue NE and the NE 117th Street bridge (as in Alternative A5); maintaining access to the Seattle Latvian Evangelical Lutheran Church; including the NE 145th Street Station based on Alternative A3, Station Option 2; and moving the guideway east of the NE 185th Street bridge (as in Alternative A5).

The project team also evaluated two potential modifications to the Preferred Alternative, including a retained cut station at NE 130th Street or a design that would allow its future addition, as well as pedestrian improvements on the NE 185th Street bridge over I-5.

2.2.2 Segment B

The Preferred Alternative is Alternative B2, East Side to Mountlake Terrace Transit Center to West Side, but with modifications moving the alignment closer to I-5 in some locations. It has the option for a station at 220th Street SW.

2.2.3 Segment C

The Preferred Alternative is similar to Alternative C3, along I-5 to Lynnwood Park-and-Ride, and maintains the existing transit center but is modified to better connect

to the Lynnwood Transit Center, preserve re-developable areas, and minimize wetland and stream impacts.

2.3 No Build Alternative

The No Build Alternative provides a basis for comparing impacts among alternatives, as required under NEPA and SEPA. It represents the transportation system and environment as they would exist without the proposed project. The No Build Alternative assumes other committed highway, transit, and nonmotorized projects identified in PSRC's *Transportation 2040* as amended in 2013, but without a major transit investment between Northgate and Lynnwood. The No Build Alternative also assumes population and employment growth as estimated by PSRC through 2035. For this Final EIS, the No Build Alternative and other alternatives incorporate recent population and growth estimates from PSRC's update in 2014; these updated assumptions are generally similar to those used for the Draft EIS.

The planned Sound Transit improvements that are included in *Transportation 2040*, and which are funded under ST2, comprise the Northgate Link Extension; the East Link Extension to Overlake in Redmond; the Federal Way Link Extension, which ST2 funds to the vicinity of Highline Community College in Des Moines; and service and access enhancements to the Sound Transit Express regional bus and Sounder commuter rail systems. *Transportation 2040* and ST2 also include a new operations and maintenance satellite facility for the expanded light rail system.

Minor local bus service additions by both King County Metro and Community Transit are also expected; however, the overall bus network and its service levels are assumed to remain similar to today.

Other projects identified in *Transportation 2040* and assumed in the No Build Alternative include the SR 520 Bridge Replacement and HOV program, and the SR 99 Alaskan Way Viaduct Replacement Program.

2.4 Typical Features of the Light Rail Alternatives

All light rail alternatives would operate in exclusive rights-of-way. This would also allow the fast and frequent service needed to serve the project corridor, with trains as often as every 4 minutes and track speeds of up to 55 mph.

Light rail would operate in a mix of surface (at-grade) and elevated configurations to address the project corridor's rolling terrain. In many locations, the alternative routes follow the general grade of I-5, with different profiles to allow the light rail guideway to cross over or under highway bridges, streets, or other physical obstacles. Figure 2-2 shows the typical features of at-grade and elevated guideways and stations.

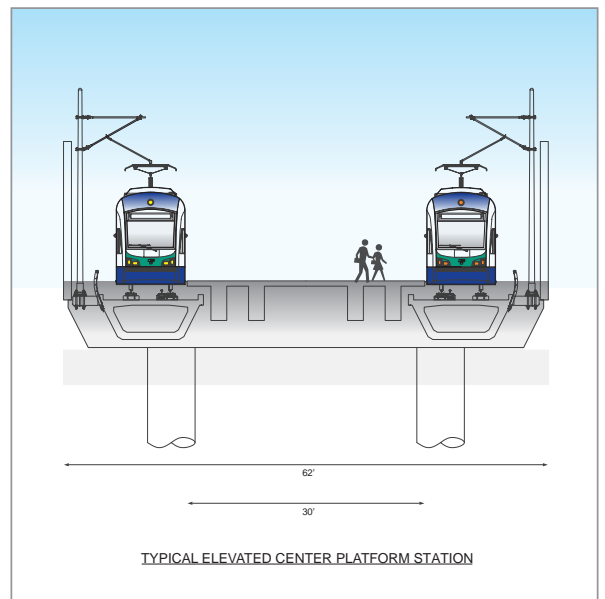
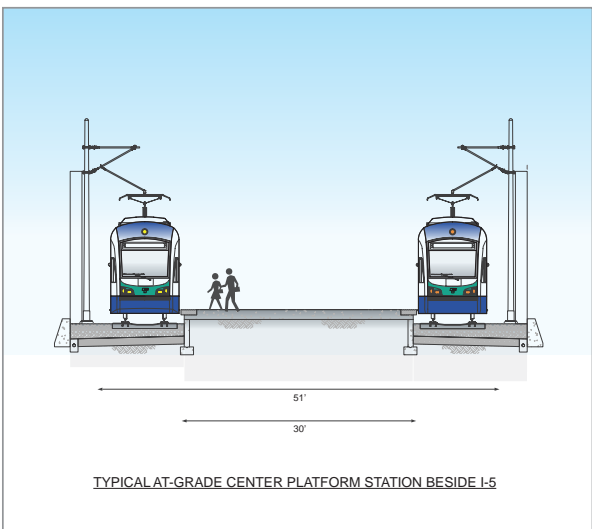
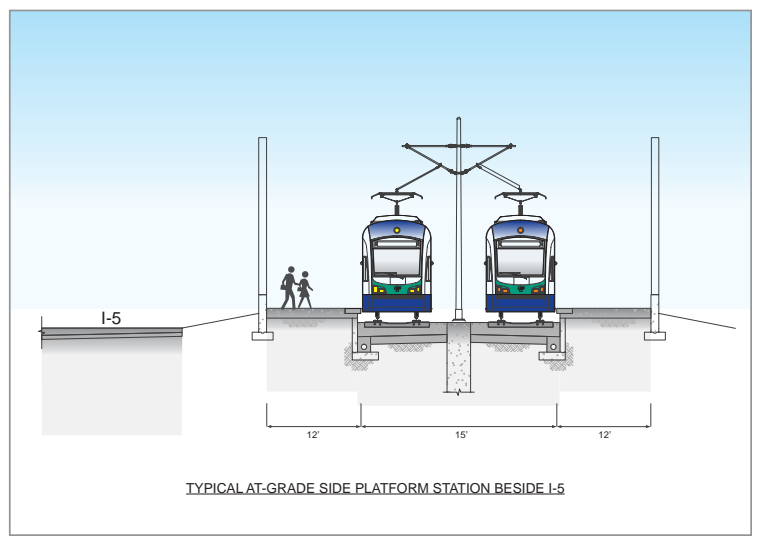
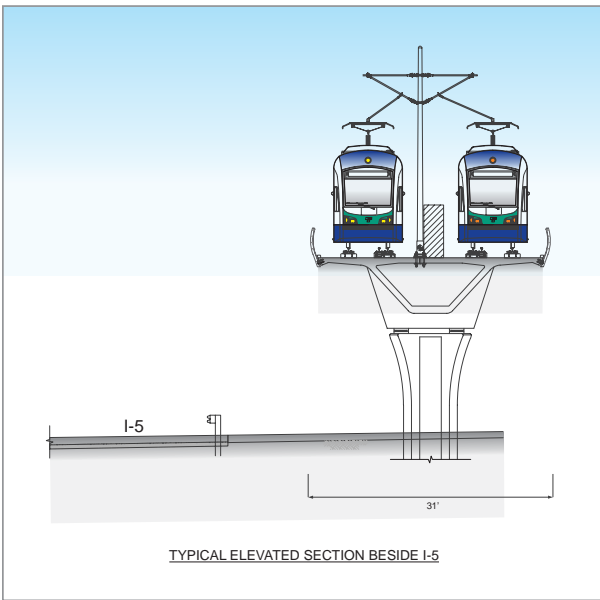
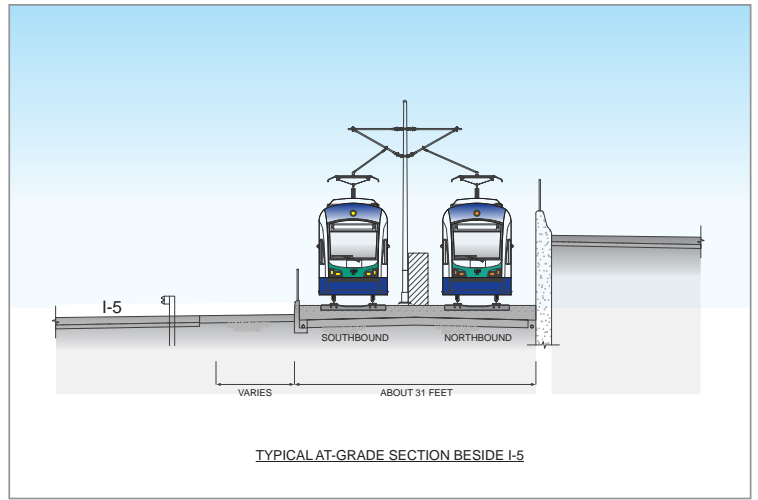
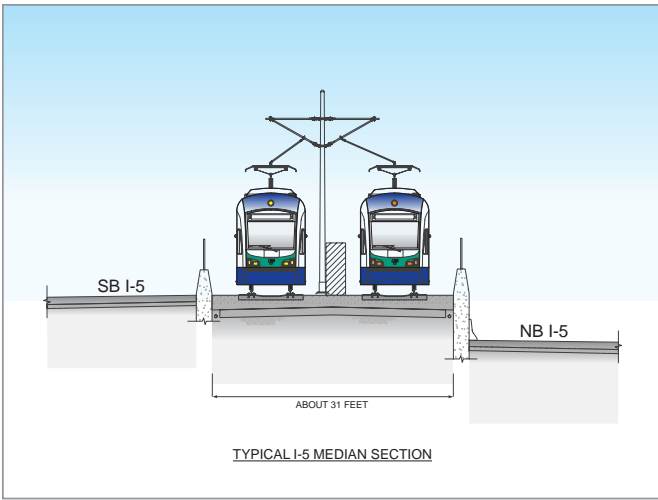


Figure 2-2
Typical Light Rail Guideways and Stations

To help define where at-grade or elevated guideways would be appropriate (and also to evaluate other profile choices such as tunnels or street-running light rail), Sound Transit has developed criteria that consider (1) topography, (2) physical barriers, (3) available surface right-of-way, (4) operating needs, (5) development density, and (6) cost. Environmental impacts and safety are also considered. Where an alignment is in the interstate right-of-way, Sound Transit must comply with highway design standards and Federal Highway Administration (FHWA) regulations.

At-grade guideways are best suited for areas where the grade is 5 or 6 percent or less and where sufficient right-of-way is available. While “at-grade guideway” typically refers to ground level, it also includes retained cut-and-fill structures that are used to maintain a consistent grade.

Elevated structures are appropriate where the topography varies more widely or creates barriers, where the light rail system must cross over other physical barriers such as cross streets and freeway lanes, where the available right-of-way is limited, or where grade separation is required for high-frequency train service. Tunnels may be options in areas with slopes of more than 5 or 6 percent; where physical barriers must be crossed; where the right-of-way is inadequate; in areas of high building density; or in areas of high train frequency. Tunnels may also be appropriate where major ridership centers cannot be served in any other way.

For the Lynnwood Link Extension, the frequent train service needed to accommodate the line’s high ridership levels requires a guideway within an exclusive right-of-way. In addition, because of terrain, limited right-of-way, frequent cross streets, or other barriers, both at-grade and elevated sections are needed.

Whether elevated or at-grade, the light rail guideways are typically 30 to 40 feet wide, with room for two sets of tracks. This width also includes room for the poles and overhead catenary (contact wire) needed to power the trains. Many sections also contain space for emergency access as well as walls or barriers that restrict unauthorized access.

Because light rail would operate mostly in the I-5 right-of-way, the choice of alignments reflects highway maintenance and operation needs, as well as potential future improvements. To develop the proposed alignment alternatives, Sound Transit consulted with FHWA and WSDOT, which have jurisdiction over any project developed within the I-5 right-of-way.

Light Rail Stations

This Final EIS evaluates the potential for the proposed project to develop four to six light rail stations to serve the major transit markets in the project corridor. The Preferred Alternative has four stations, with two other optional stations. The stations would be either elevated or at-grade according to their site conditions and

the design needs for the connecting guideway; however, the station designs have common features.

Boarding platforms would be approximately 380 feet long to serve four-car trains, and located either on the outer side of the tracks or in the center with tracks on both sides. Escalators, elevators, and stairs would be provided to access the platforms. All stations would meet the standards of the Americans with Disabilities Act (ADA). They would include pedestrian and bicycle access to and from feeder bus lines, park-and-ride facilities, and surrounding streets, and would satisfy all applicable public access, fire, and life-safety requirements. For safety purposes, the trains would sound warning bells when they enter or leave a station. Each station would have at least one bicycle storage area with space for expansion.

Most of the stations would have parking areas for transit patrons in either a structure or a surface lot, including some surface lots leased from other parties. At several station locations, the existing transit facilities already include park-and-ride lots that would be expanded or reconfigured, including surface lots that would be converted to parking garages. Some stations or garages could also be built to allow commercial spaces or other transit-oriented developments, as long as these non-transportation elements are not in the I-5 right-of-way.

Other Facilities and Structures

Traction power substations along the project alignment would provide power to the overhead catenary (wire suspended above the light rail that provides electricity to the trains). These one-story structures are generally screened by a wall or fence, and sited at stations or along or beneath the light rail guideway.

Other structures would be required. Noise walls would be needed to avoid transit noise impacts. Much of the elevated guideway would have short (3 to 4 feet) noise walls incorporated into the guideway structure itself, although some locations would require higher noise walls built between the guideway and the noise receivers (homes or other buildings). At-grade guideways in areas with slopes would have retaining walls where the route cuts into an adjacent hillside. These retaining walls would also hold fill for the guideway. In a number of locations, noise walls would be placed on top of retaining walls. In other locations, Sound Transit would relocate existing WSDOT highway walls.

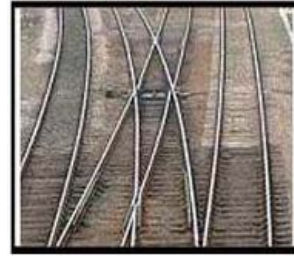


Example of a Traction Power Substation



Light Rail Train with Overhead Catenary Wires in Tukwila, WA

Some sections of the guideway would feature crossover tracks with switches to allow trains to safely pass from one set of tracks to the other during track maintenance, to bypass a stalled train, to turn the opposite direction, or to operate in the event of emergencies. At the terminus station, tail tracks would extend beyond the station platform to store trains that are leaving service or waiting to enter service.



Crossover Tracks

The project also includes stormwater management facilities such as detention or infiltration ponds, vaults, swales, or other bioretention facilities, or vegetated embankments along the corridor. Detention ponds vary in size, but could be 200 feet wide, and often require fencing.

Other structural features would include retaining walls in areas with steeper slopes, or where the walls are needed to hold fill.

2.5 Descriptions of Light Rail Alternatives by Segment

The following subsections describe key features of the light rail alternatives based on conceptual design information. Appendix F, Conceptual Plans, includes conceptual design drawings that show the key elements assumed for each light rail alternative's alignment and stations. The conceptual designs include the primary elements required to develop and operate a light rail alternative; landscaping, screening, and other design elements would be further detailed in later stages of project design. In addition, further design, mitigation planning, permitting, and construction-stage planning might identify other features needed for construction staging, construction access, utility work, and other infrastructure connections.

Finally, the alternatives described below reflect different combinations of key features for the project. The individual alternatives have some features, such as stations or localized design elements, which could work for other alternatives in a segment. This is particularly true in Segment A, where the alignments all remain along the east side of I-5, but there are different ways to approach the station design, profile, or structures for light rail; street modifications; parking areas; or other features. When it ultimately defines the project to be built, the Sound Transit Board could choose a combination of these elements different than those presented in this EIS.

Tables 2-1a, 2-1b, and 2-1c summarize the key features and options of each alternative; Figures 2-3 through 2-10 illustrate them.

Table 2-1a. Summary of Design Features for Segment A Alternatives

Cross Streets	Preferred Alternative At-grade/ elevated with NE 145th and NE 185th Stations	Alternative A1 At-grade/Elevated with NE 145th and NE 185th Stations	A3 Mostly Elevated with NE 145th and NE 185th Stations	A5 At-grade/Elevated with NE 130th, NE 155th, and NE 185th Stations	A7 Mostly Elevated with NE 130th, NE 155th, and NE 185th Stations	A10 At-grade/Elevated with NE 130th, NE 145th, and NE 185th Stations	A11 Mostly Elevated with NE 130th, NE 145th, and NE 185th Stations
NE 104th Street to Northgate Way	<ul style="list-style-type: none"> Elevated guideway from NE 104th Street at Northgate, crossing over 1st Avenue NE 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Similar to Preferred Alternative
NE 117th Street overpass	<ul style="list-style-type: none"> At-grade/elevated east of NE 117th Street overpass 	<ul style="list-style-type: none"> Crosses west of a rebuilt NE 117th Street overpass 	<ul style="list-style-type: none"> Crosses over existing overpass 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Same as Alternative A3 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Same as Alternative A3
NE 117th Street to NE 130th Street	<ul style="list-style-type: none"> At-grade with sections of retained cut or fill (aligned between I-5 and 5th Avenue NE) 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Elevated 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Same as Alternative A3 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Same as Alternative A3
NE 130th Street	<ul style="list-style-type: none"> Crosses under NE 130th Street off-ramp and NE 130th Street overpass (both rebuilt) Rebuilds 5th Avenue NE and reconstructs NE 130th Street off-ramp as grade-separated 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Crosses over existing overpass 	<ul style="list-style-type: none"> NE 130th Street Station Option 1: At-grade (center platform) NE 130th Street overcrossing re-aligned 5th Avenue NE and NE 130th Street off-ramp grade-separated rebuild 100 off-site parking spaces 	<ul style="list-style-type: none"> NE 130th Street Station Option 2: elevated 100 parking spaces to the north 	<ul style="list-style-type: none"> Same as Alternative A5, but with no parking at NE 130th Street Station 	<ul style="list-style-type: none"> Same as Alternative A7
NE 130th Street to NE 145th Street	<ul style="list-style-type: none"> Along 5th Avenue NE, at-grade to NE 137th Street, elevated to NE 145th Street 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Elevated to NE 145th Street 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Same as Alternative A3 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Same as Alternative A3

Table 2-1a. Summary of Design Features for Segment A Alternatives

Cross Streets	Preferred Alternative At-grade/ elevated with NE 145th and NE 185th Stations	Alternative A1 At-grade/Elevated with NE 145th and NE 185th Stations	A3 Mostly Elevated with NE 145th and NE 185th Stations	A5 At-grade/Elevated with NE 130th, NE 155th, and NE 185th Stations	A7 Mostly Elevated with NE 130th, NE 155th, and NE 185th Stations	A10 At-grade/Elevated with NE 130th, NE 145th, and NE 185th Stations	A11 Mostly Elevated with NE 130th, NE 145th, and NE 185th Stations
NE 145th Street	<ul style="list-style-type: none"> • NE 145th Street station moves I-5 northbound on-ramp • 500-car garage 	<ul style="list-style-type: none"> • NE 145th Street Station Option 1: • 500-car garage north of I-5 on-ramp 	<ul style="list-style-type: none"> • NE 145th Street Station Option 2: Moves I-5 on-ramp farther north • 500-car garage south of new I-5 on-ramp 	<ul style="list-style-type: none"> • Elevated crossing – no station 	<ul style="list-style-type: none"> • Same as Alternative A5 	<ul style="list-style-type: none"> • NE 145th Street Station Option 1: Keeps existing northbound on-ramp • 650 parking spaces 	<ul style="list-style-type: none"> • Similar to Preferred Alternative
NE 145th Street to NE 175th Street	<ul style="list-style-type: none"> • Elevated to NE 150th Street • At-grade to NE 154th Street • Elevated to NE 157th Street • At-grade to NE 174th Street • Realigns 1st Avenue NE south of NE 161st Street and south of NE 175th Street • Elevated guideway adjacent to I-5 overpass at NE 175th Street 	<ul style="list-style-type: none"> • Similar to Preferred Alternative 	<ul style="list-style-type: none"> • Elevated to NE 157th Street • At-grade to NE 174th Street; realigns sections of 1st Avenue NE 	<ul style="list-style-type: none"> • Alignment similar to Preferred Alternative • Elevated station at NE 155th Street • 500-car parking garage south side of street 	<ul style="list-style-type: none"> • Elevated to NE 148th Street • At-grade to NE 154th Street • Elevated to NE 156th Street • At-grade to NE 174th Street; realigns parts of 1st Avenue NE 	<ul style="list-style-type: none"> • Similar to Preferred Alternative 	<ul style="list-style-type: none"> • Similar to Preferred Alternative
NE 175th Street to NE 185th Street	<ul style="list-style-type: none"> • NE 178th Street to NE 185th Street at-grade • Realigns 5th Avenue NE near NE 185th Street 	<ul style="list-style-type: none"> • Similar to Preferred Alternative 	<ul style="list-style-type: none"> • NE 174th Street to NE 185th Street: elevated • Realigns 1st Avenue NE near NE 175th Street 	<ul style="list-style-type: none"> • Similar to Preferred Alternative 	<ul style="list-style-type: none"> • Same as Alternative A3 	<ul style="list-style-type: none"> • Similar to Preferred Alternative 	<ul style="list-style-type: none"> • Same as Alternative A3

Table 2-1a. Summary of Design Features for Segment A Alternatives

	Preferred Alternative	Alternative A1	A3	A5	A7	A10	A11
Cross Streets	At-grade/ elevated with NE 145th and NE 185th Stations	At-grade/Elevated with NE 145th and NE 185th Stations	Mostly Elevated with NE 145th and NE 185th Stations	At-grade/Elevated with NE 130th, NE 155th, and NE 185th Stations	Mostly Elevated with NE 130th, NE 155th, and NE 185th Stations	At-grade/Elevated with NE 130th, NE 145th, and NE 185th Stations	Mostly Elevated with NE 130th, NE 145th, and NE 185th Stations
NE 185th Street	<ul style="list-style-type: none"> • Crosses in underpass east of NE 185th Street bridge, and realigns 5th Avenue NE (south of NE 185th Street) • NE 185th Street preferred station: at-grade • 500-car parking garage west of I-5, and realigns 5th Avenue NE (north of NE 185th Street) • Expands overpass for pedestrians 	<ul style="list-style-type: none"> • At-grade station east of I-5, 500-car parking garage west of I-5 • Realigns 5th Avenue NE • Rebuilds NE 185th Street bridge 	<ul style="list-style-type: none"> • NE 185th Street Station Option 2: elevated • 500-car park-and-ride east of I-5, east of station; either in surface garage or below grade with a surface-level bus plaza 	<ul style="list-style-type: none"> • NE 185th Street Station Option 3: at-grade • Surface parking for up to 350 cars 	<ul style="list-style-type: none"> • Same as Alternative A3 	<ul style="list-style-type: none"> • Same as Alternative A5 	<ul style="list-style-type: none"> • Same as Alternative A3
Preferred Alternative Options	<ul style="list-style-type: none"> • NE 130th Street Station Option • Shoreline Stadium parking garage at NE 185th Street 						

Table 2-1b. Summary of Design Features for Segment B Alternatives

Cross Streets	Preferred Alternative	B1	B2A	B4
	East Side to Mountlake Terrace Transit Center to West Side	East Side to Mountlake Terrace Transit Center to Median	East Side to Mountlake Terrace Transit Center to West Side with 220th Station North Option	East Side to Mountlake Terrace Freeway Station to Median
NE 185th Street to NE 195th Street	<ul style="list-style-type: none"> Retained cut on east side NE 195th Street pedestrian bridge reconstructed 	<ul style="list-style-type: none"> Retained cut or elevated east side (depends on Segment A alternative) NE 195th Street pedestrian bridge reconstructed 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Same as Alternative B1
NE 195th Street to Ballinger Way/SR 104 overpass	<ul style="list-style-type: none"> Elevated on east side of I-5 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Similar to Preferred Alternative
Ballinger Way/SR 104 overpass	<ul style="list-style-type: none"> Elevated Crosses over Ballinger Way/SR 104 interchange 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Similar to Preferred Alternative but more to the west
Ballinger Way/SR 104 overpass to 236th Street SW	<ul style="list-style-type: none"> Elevated east side 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Crosses over 236th Street SW northbound I-5 off-ramp and northbound I-5 lanes Drops to median at-grade and crosses under 236th Street SW overpass
236th Street SW overpass	<ul style="list-style-type: none"> Mountlake Terrace Transit Center Station: elevated Station straddles 236th Street SW Existing surface lot reconfigured 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Similar to Preferred Alternative 	<ul style="list-style-type: none"> Crosses under 236th Street SW overpass Mountlake Terrace Freeway Station: reconstructs and extends current bus station New north end station pedestrian bridge

Table 2-1b. Summary of Design Features for Segment B Alternatives

Cross Streets	Preferred Alternative East Side to Mountlake Terrace Transit Center to West Side	B1 East Side to Mountlake Terrace Transit Center to Median	B2A East Side to Mountlake Terrace Transit Center to West Side with 220th Station North Option	B4 East Side to Mountlake Terrace Freeway Station to Median
236th Street SW to 220th Street SW overpass	<ul style="list-style-type: none"> Continues north elevated Crosses I-5 lanes to west side and descends to near freeway grade, crossing under 228th Street SW Transitions to elevated south of 220th Street SW Elevated over 220th Street SW, reconstructs southbound I-5 ramps 	<ul style="list-style-type: none"> Continues north elevated Short section retained cut in hillside north of Mountlake Terrace Transit Center Crosses over northbound I-5 lanes Enters freeway median, drops to grade near 232nd Street SW At-grade in median under 220th Street SW overpass 	<ul style="list-style-type: none"> Similar to Preferred Alternative to south of 220th Street SW Elevated with 220th Street SW Station elevated over the street 200-space parking garage north of 220th Street SW 	<ul style="list-style-type: none"> Drops to median and runs at-grade north of the freeway station Continues at-grade in median under 220th Street SW
220th Street SW to 212th Street SW	<ul style="list-style-type: none"> Curves to east side of 60th Avenue West Elevated along west side of I-5 with at-grade retained cut/fill section Crossover tracks south of 212th Street SW Crosses over 212th Street SW 	<ul style="list-style-type: none"> At-grade in median Crossover tracks south of 212th Street SW 	<ul style="list-style-type: none"> Similar to Preferred Alternative but with differences in alignment for station configuration 	<ul style="list-style-type: none"> Same as Alternative B1
Options	<ul style="list-style-type: none"> 220th Street Station South Option, south of street with 200-car surface lot, with alignment shifting west to the station; no modification to I-5 ramps 	<ul style="list-style-type: none"> Parking garage on existing surface lot at Mountlake Terrace Transit Center, adding about 280 spaces 		

Table 2-1c. Summary of Design Features for Segment C Alternatives

Cross Streets	Preferred Alternative West Side to Lynnwood Transit Center Station	C1 52nd Avenue West to 200th Street SW Station	C2 52nd Avenue West to Lynnwood Transit Center Station	C3 Along I-5 to Lynnwood Park-and-Ride Station
Option 1: From I-5 median	<ul style="list-style-type: none"> Continues at-grade in median At about 208th Street SW, transitions to cross over southbound I-5 Crosses Interurban Trail 	<ul style="list-style-type: none"> Transitions from at-grade in median near 210th Street SW; elevated guideway to cross southbound I-5 lanes to 52nd Avenue West Continues elevated north along east side of 52nd Avenue West 	<ul style="list-style-type: none"> Same as Alternative C1 	<ul style="list-style-type: none"> Continues at-grade in median At about 208th Street SW, transitions to cross elevated over southbound I-5 lanes, and reconstructs a portion of 208th Street SW where alignment crosses over it Crosses Interurban Trail
Option 2: From west side of I-5	<ul style="list-style-type: none"> Elevated west side of I-5 Alignment gradually shifts away from I-5 after 208th Street SW Crosses Interurban Trail 	<ul style="list-style-type: none"> Elevated along west side of I-5 until it approaches 52nd Avenue West Turns north, elevated along east side of 52nd Avenue West 	<ul style="list-style-type: none"> Same as Alternative C1 	<ul style="list-style-type: none"> Similar to Preferred Alternative
52nd Avenue West	<ul style="list-style-type: none"> Not applicable 	<ul style="list-style-type: none"> Elevated along east side of 52nd Avenue West Turns east over corner of Scriber Creek Park at 200th Street SW Crosses Interurban Trail 	<ul style="list-style-type: none"> As elevated guideway approaches 204th Street SW, alignment turns NE and crosses south of Scriber Creek Park Crosses Interurban Trail 	<ul style="list-style-type: none"> Not applicable
Lynnwood Transit Center	<ul style="list-style-type: none"> Elevated Lynnwood Transit Center station (diagonally across 46th Avenue West) New garage replaces surface parking and adds 500 spaces, for 1,900 total spaces at the park-and-ride Existing bus transit center remains Option to maintain 400 spaces of surface parking, providing 2,300 total spaces Tail tracks over 44th Avenue West 	<ul style="list-style-type: none"> Elevated along south side of 200th Street SW Elevated 200th Street SW Station 2 garages add 500 spaces to the existing park-and-ride 	<ul style="list-style-type: none"> Elevated Lynnwood Transit Center station south of 48th Street West and existing transit center New garage replaces surface parking and adds 500 more spaces 	<ul style="list-style-type: none"> Lynnwood Park-and-Ride light rail station (south of 48th Avenue West, east of existing direct access ramp): elevated New garage replaces surface parking and adds 500 spaces Station Option 1: Existing bus transit center remains Station Option 2: Existing bus transit center relocated

2.5.1 Segment A: Seattle to Shoreline

The Segment A alternatives reflect choices about the location of stations (at NE 130th Street, NE 145th Street, NE 155th Street, or NE 185th Street) as well as the number of stations (two or three). The station locations and height and location of existing street overcrossings of I-5 also largely influence whether the alignment is at-grade or elevated at a given location.

Preferred Alternative: At-grade/Elevated with NE 145th and NE 185th Stations

The Preferred Alternative (Figure 2-3) is an at-grade/elevated alignment with stations at NE 145th Street and NE 185th Street. It is similar to Alternative A1 from the Draft EIS, but in some locations the Preferred Alternative incorporates features from other alternatives, as well as design refinements to help minimize impacts or improve performance. It would begin alongside 1st Avenue NE, south of the I-5 ramps for Northgate, and connect to the tail tracks Sound Transit is constructing for the Northgate Link Extension. The elevated guideway would cross over 1st Avenue NE and stay elevated to about 115th Street NE, where it would descend to pass east of the NE 117th Street overpass and then continue along I-5. The existing pedestrian path connection at NE 116th Street would be reconstructed under the guideway and connected to NE 115th Street. The Preferred Alternative would realign a section of 3rd Avenue NE, which would maintain access for the Seattle Latvian Evangelical Lutheran Church. This alignment would generally run at-grade between 5th Avenue NE and I-5, typically at the same level as I-5, with short sections of retained cut or retained fill structures. It would replace the NE 130th Street off-ramp and the NE 130th Street bridge over I-5, relocating the ramp farther south and grade-separating it from southbound 5th Avenue NE, which would be rebuilt lower to go under the new off-ramp. The Preferred Alternative would rebuild the NE 130th Street and 5th Avenue NE intersection and adjacent street sections, including sidewalks and bicycle facilities.

The guideway would continue along 5th Avenue NE and transition to an elevated structure to reach the elevated NE 145th Street Station on the north side of the street. This center platform station would have a parking structure with up to five levels and approximately 500 spaces. It would relocate the existing northbound on-ramp to I-5 to the north, creating a new signalized intersection on 5th Avenue NE. It would also close the existing transit ramps and freeway station.

The Preferred Alternative would transition to retained fill north of the NE 145th Street Station. It would then cross over NE 155th Street on an elevated guideway, continuing on retained cut-and-fill sections, including a retained fill section along the edge of Ridgecrest Park, with a realignment of a section of 1st Avenue NE south of the park. It would bridge over NE 175th Street and continue in a retained cut to under NE 185th Street. Sections of 1st Avenue NE would also be realigned near

NE 175th Street, and 5th Avenue/7th Avenue NE would be realigned south of NE 185th Street. There would be a center platform station in a retained cut just north of NE 185th Street, with the alignment crossing under the street to reach the platform. A surface plaza would be above the platform, and access driveways would be to the east near 8th Avenue NE. A 500-space park-and-ride garage with about four levels would be west of I-5, which would require realigning 5th Avenue NE north of NE 185th Street. The NE 185th Street overpass would be widened to better serve pedestrian trips between the station and the parking garage.

Options for the Preferred Alternative

NE 130th Street Station Option. This Final EIS also considers, as an option to the Preferred Alternative, a station just north of NE 130th Street that could be built as part of the project, or partly built and then completed for service later. It would be a center platform, retained-cut station, with the platform close to the level of I-5 and a street-level plaza along 5th Avenue NE and NE 130th Street. The station access plan assumes 100 park-and-ride spaces in a nearby existing lot.

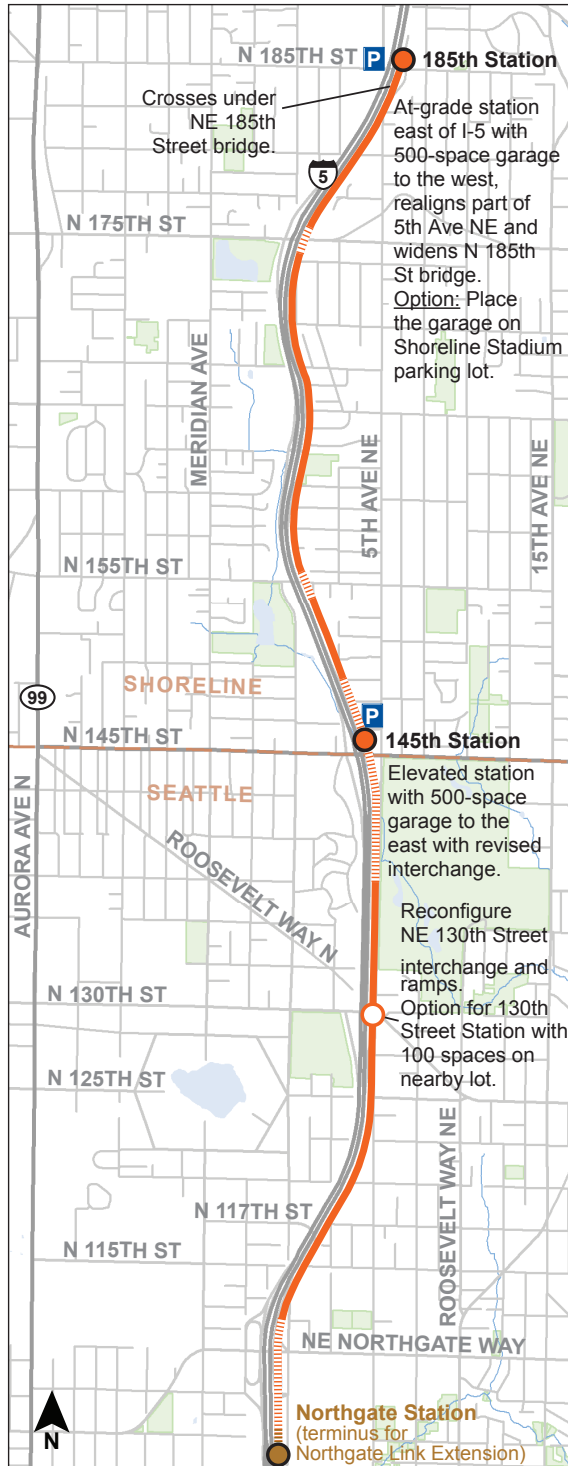
NE 185th Street/Stadium Parking Garage Option. Alternatively, the 500-space parking garage could be built at the existing Shoreline Stadium parking lot, instead of between I-5 and 5th Avenue NE.

Alternative A1: At-grade/Elevated with NE 145th and NE 185th Stations

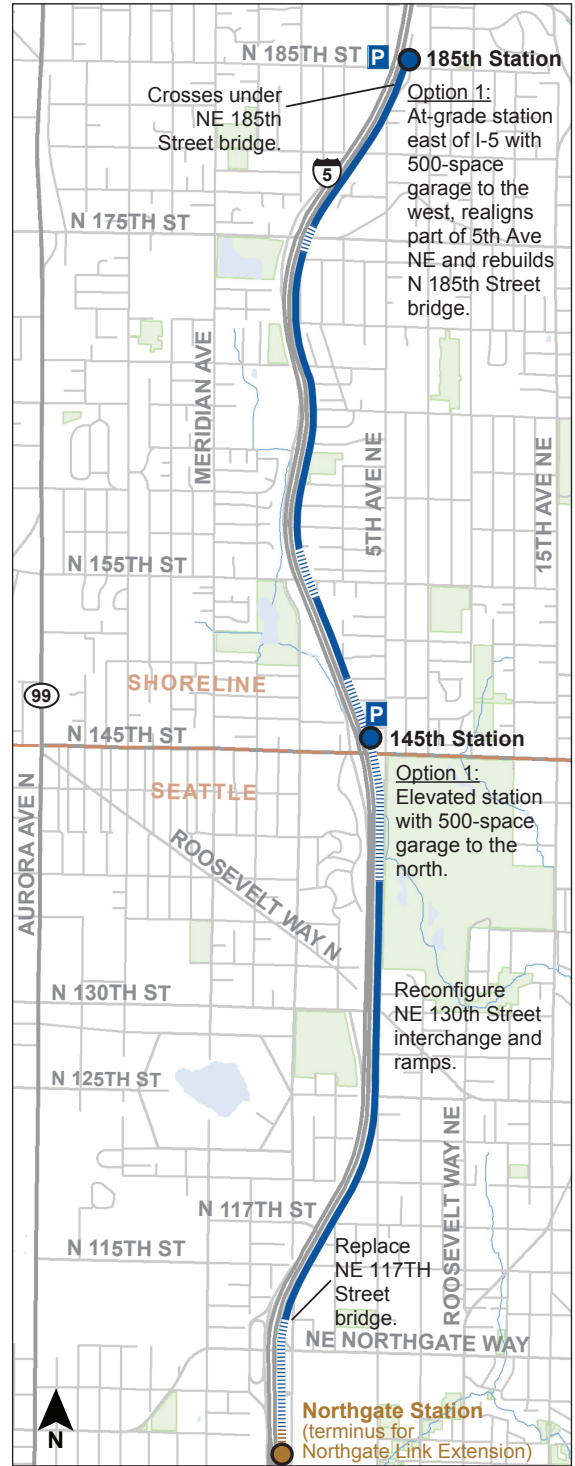
Alternative A1 (Figure 2-3) is similar to the Preferred Alternative, but it has different station options and design features in some locations. North of Northgate Way, it would stay closer to I-5 than the Preferred Alternative, crossing west of the NE 117th Street overpass, which would be realigned and rebuilt. Like the Preferred Alternative, this alternative maintains access for the Seattle Latvian Evangelical Lutheran Church by realigning 3rd Avenue NE. The alignment would then continue north, similar to the Preferred Alternative, up to NE 145th Street.

This alternative includes NE 145th Street Station Option 1, an elevated center-platform station, with a platform above the existing I-5 transit-only off-ramp and northbound on-ramp, and a ground-level plaza on the north side of NE 145th Street. To the north, a parking structure with up to three levels would provide approximately 500 spaces.

Alternative A1 would continue north, similar to the Preferred Alternative, up to just south of NE 185th Street, where it would include the NE 185th Street Station Option 1, which is similar to the Preferred Alternative's station but requires rebuilding the NE 185th Street bridge.



**PREFERRED ALTERNATIVE SEGMENT A:
AT-GRADE/ELEVATED WITH NE 145th
AND NE 185th STATIONS**



**A1: AT-GRADE/ELEVATED WITH NE 145th
AND NE 185th STATIONS**

- Elevated
- At-Grade
- Station
- Station Option
- Parking Structure
- Surface Parking
- Roadway
- Local Street
- City Boundary
- County Boundary
- Park
- Waterbody

Figure 2-3
Preferred Alternative and Alternative A1

Alternative A3: Mostly Elevated with NE 145th and NE 185th Stations

Alternative A3 is similar to Alternative A1, but it would be elevated to the NE 145th Street Station (see Figure 2-4). It would cross over the existing NE 117th Street bridge and the NE 130th Street off-ramp and overpass, thus avoiding the need to rebuild these facilities. The NE 145th Street Station Option 2 is similar to the Preferred Alternative's station.

North of NE 145th Street, Alternative A3 would be similar to the Preferred Alternative until NE 175th Street, but would then continue on an elevated guideway to the NE 185th Street Station. It also would require a realignment of 1st Avenue NE near NE 175th Street and 5th Avenue NE near NE 185th Street. The NE 185th Street Station Option 2 would be elevated, and to the east would be an approximately 500-stall parking garage and an integrated transit center with a circular transit driveway.

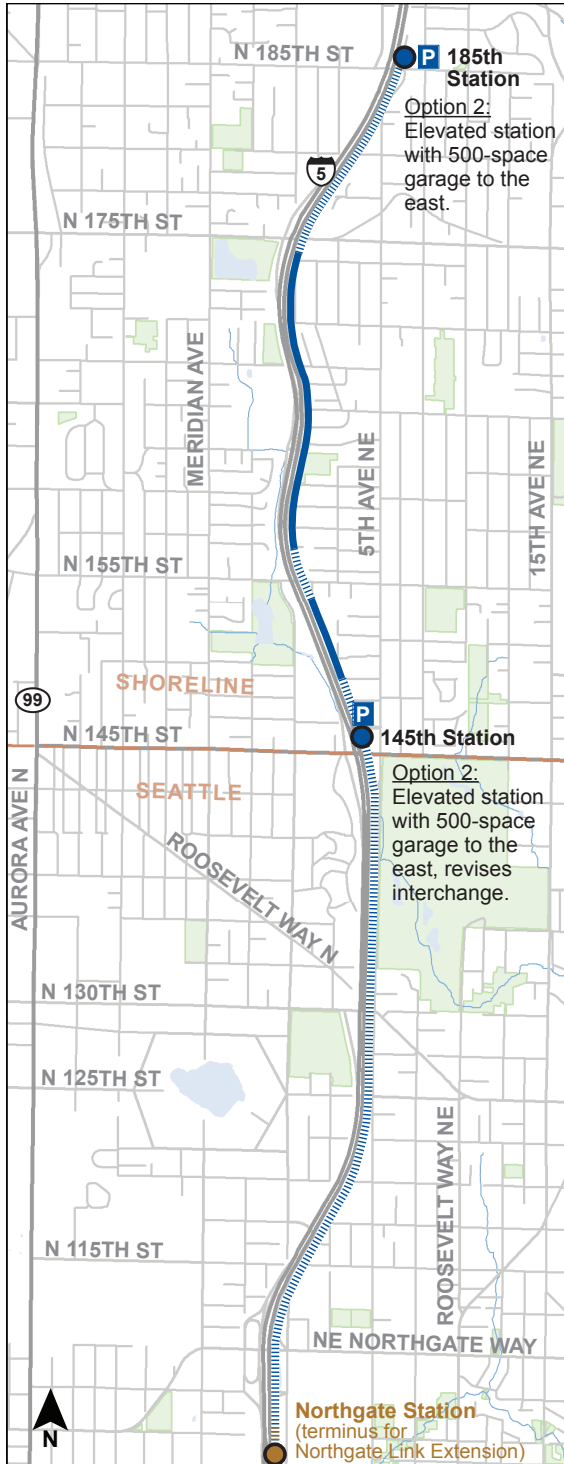
Alternative A5: At-grade/Elevated with NE 130th, NE 155th, and NE 185th Stations

Alternative A5 is largely based on Alternative A1, but would feature stations at NE 130th Street and NE 155th Street (instead of a station at NE 145th Street), and with a third configuration for the NE 185th Street Station (see Figure 2-4). It also would cross at-grade east of the NE 117th Street overpass (similar to the Preferred Alternative), thus avoiding the need for rebuilding the bridge. Like Alternative A1, it would rebuild the NE 130th Street I-5 off-ramp and overcrossing, including the 5th Avenue NE intersection and roadway.

The NE 130th Street Station Option 1 is the same as the option described for the Preferred Alternative.

The route would continue on retained fill, before moving to an elevated section near Jackson Park Golf Course, similar to Alternative A1. Except for a short section in retained fill, it would continue elevated to a NE 155th Street Station, which would be next to the I-5 bridge over NE 155th Street. There would be a 500-space parking garage with up to four levels on the south side of NE 155th street.

This alignment would be the same as Alternative A1 from the NE 155th Street Station to the NE 185th Street Station Option 3, a retained-cut station under the NE 185th Street overpass, similar to Option 1 with Alternative A1, but without rebuilding the NE 185th Street overpass. It would include surface parking for approximately 350 vehicles on two lots east of this station.



A3: MOSTLY ELEVATED WITH NE 145th AND NE 185th STATIONS



A5: AT-GRADE/ELEVATED WITH NE 130th, NE 155th AND NE 185th STATIONS

- Elevated
- At-Grade
- Station
- Station Option
- Parking Structure
- Surface Parking
- Roadway
- Local Street
- City Boundary
- County Boundary
- Park
- Waterbody

Figure 2-4
Alternatives A3 and A5

Alternative A7: Mostly Elevated with NE 130th, NE 155th, and NE 185th Stations

Alternative A7 begins with the mostly elevated guideway alignment of Alternative A3, including elevated sections over the NE 117th Street overpass and the NE 130th Street off-ramp and bridge (see Figure 2-5). It has the same station locations as Alternative A5, but with the elevated Option 2 at NE 130th Street. There would be parking for approximately 100 vehicles north of the station and under the elevated guideway along 5th Avenue NE.

From NE 130th Street north to the station at NE 155th Street, the alignment would be the same as Alternative A5. From NE 155th Street, it would be the same as Alternative A3.

Alternative A10: At-grade/Elevated with NE 130th, NE 145th, and NE 185th Stations

Alternative A10 (see Figure 2-5) is similar to the Preferred Alternative and Alternative A5 up to NE 130th Street. It would include the at-grade NE 130th Street Station Option 1, but with no parking. From NE 130th Street north to NE 145th Street, Alternative A10 would be the same as Alternative A1. North of NE 145th Street, Alternative A10 would be the same as Alternative A5.

Alternative A11: Mostly Elevated with NE 130th, NE 145th, and NE 185th Stations

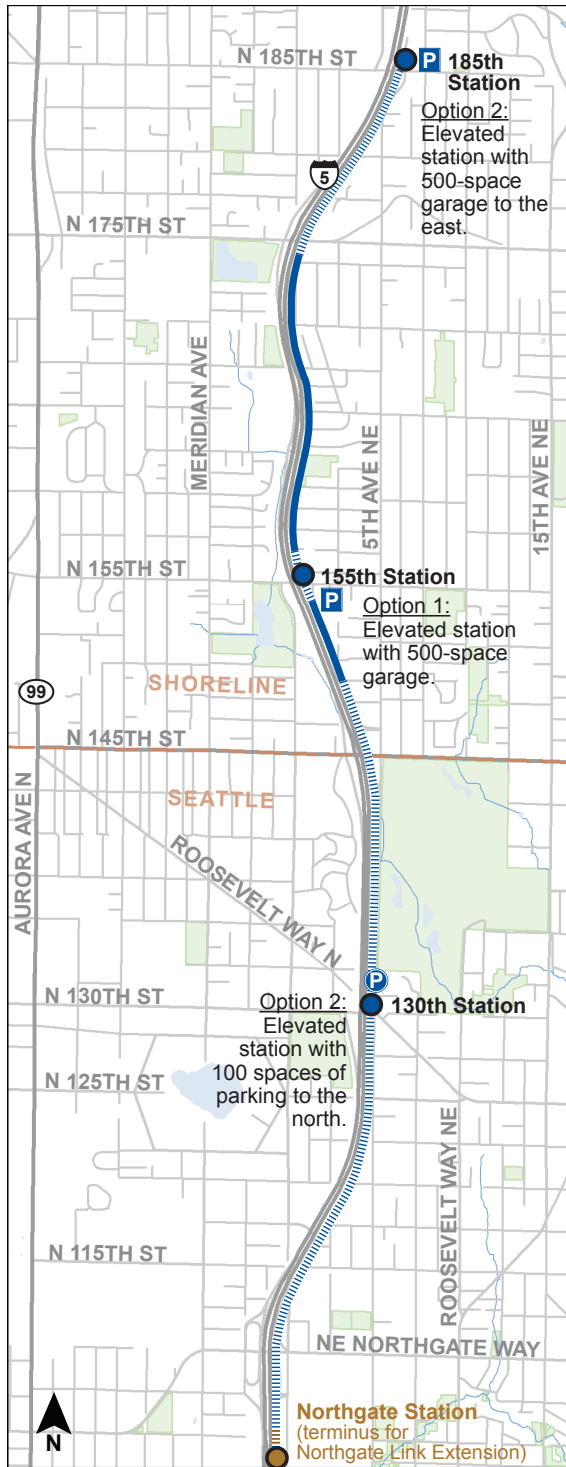
Alternative A11 is the same as Alternative A7, except with an elevated station at NE 145th Street (Station Option 2) instead of a NE 155th Street Station (see Figure 2-6).

2.5.2 Segment B: Shoreline to Mountlake Terrace

The Segment B alternatives feature a Mountlake Terrace Station location (at the current transit center or at its freeway station) and either use the freeway median or cross over to the west side of I-5. Two of the alternatives feature an additional station choice at 220th Street SW.

Preferred Alternative: East Side to Mountlake Terrace Transit Center to West Side

The Preferred Alternative modifies Alternative B2 from the Draft EIS to minimize impacts and improve operations. It would begin north of the NE 185th Street Station in a retained cut along the east side of I-5 (see Figure 2-7), crossing under the NE 195th Street pedestrian bridge, which would be replaced. It would continue mostly elevated to the north and cross over the Lake Ballinger Way/SR 104 interchange and over 236th Street SW to reach an elevated station at the Mountlake Terrace Transit Center, east of the existing parking garage. The station platform would straddle 236th Street SW. The south entrance would include a new path connecting to existing streets. To provide effective access at this station, including access for bus transit, Sound Transit would reconfigure the existing transit center's surface parking and circulation to the east of the current parking garage, while maintaining its parking capacity. The route would then continue north on an elevated structure, crossing over to the west side of I-5.



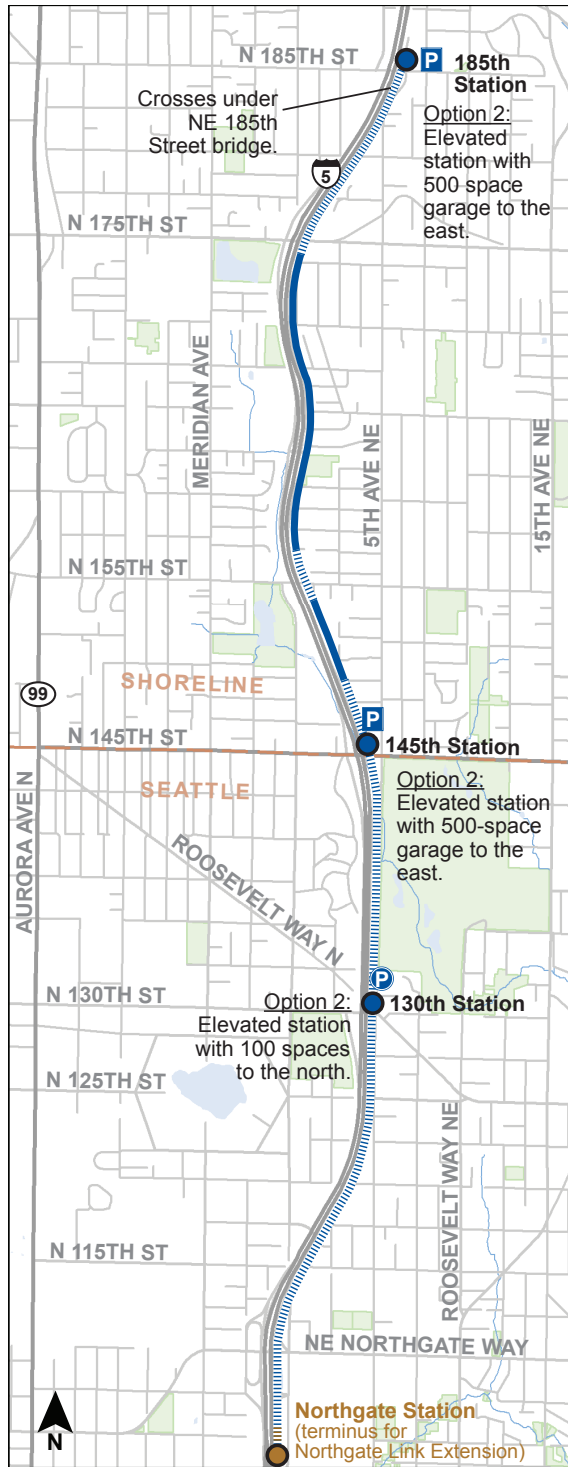
A7: MOSTLY ELEVATED WITH NE 130th, NE 155th AND NE 185th STATIONS



A10: AT-GRADE/ELEVATED WITH NE 130th, NE 145th AND NE 185th STATIONS

- Elevated
- At-Grade
- Station
- Station Option
- Parking Structure
- Surface Parking
- Roadway
- Local Street
- City Boundary
- County Boundary
- Park
- Waterbody

Figure 2-5
Alternatives A7 and A10



A11: MOSTLY ELEVATED WITH NE 130th, NE 145th AND NE 185th STATIONS

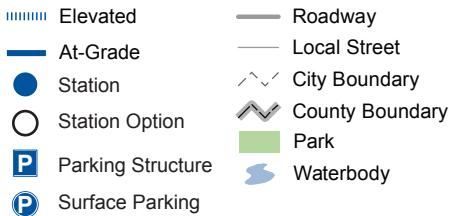
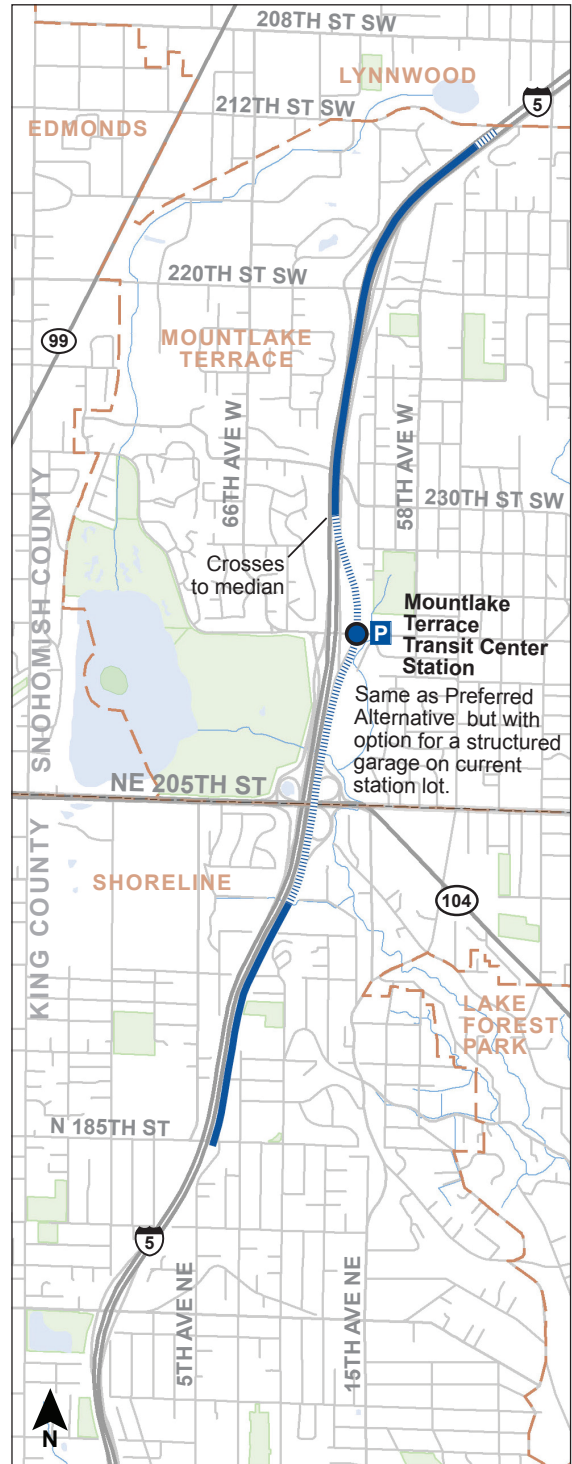


Figure 2-6
Alternative A11



**PREFERRED ALTERNATIVE SEGMENT B:
EAST SIDE TO MOUNTLAKE TERRACE TRANSIT
CENTER TO WEST SIDE**



**B1: EAST SIDE TO MOUNTLAKE TERRACE
TRANSIT CENTER TO MEDIAN**

- | | | | |
|--|-------------------|--|-----------------|
| | Elevated | | Roadway |
| | At-Grade | | Local Street |
| | Station | | City Boundary |
| | Station Option | | County Boundary |
| | Parking Structure | | Park |
| | Surface Parking | | Waterbody |

**Figure 2-7
Preferred Alternative and Alternative B1**

To reduce impacts on forested areas and a property designated for highway beautification purposes when I-5 was originally developed, Sound Transit has shifted the alignment lower on the hillside, mostly in a retained cut until just south of 220th Street SW. Then it would become elevated, continuing over 220th Street SW and realigning the I-5 southbound on-ramp and off-ramp slightly east. The alignment would then be elevated on the east side of 60th Avenue West, and along the west side of I-5, mostly on retained cut and fill structures, before crossing over 212th Street SW.

Option for the Preferred Alternative

An optional station could be located south of 220th Street SW, on a now-vacant parcel that previously housed an elementary school. The station and its 200-space parking lot could be developed as part of the project, or partially built and completed later. It would require shifting the alignment westward to reach the station and crossing elevated over 220th Street SW slightly west of the alignment for the Preferred Alternative, but would not require realigning the I-5 on-ramp and off-ramp.

Alternative B1: East Side to Mountlake Terrace Transit Center to Median

Alternative B1 is the same as the Preferred Alternative between NE 185th Street and the north side of the Mountlake Terrace Transit Center Station (see Figure 2-7).

From there, it would continue north on an elevated guideway, with a short section cut into the hillside north of the transit center. It would then cross over the northbound lanes of I-5, enter the freeway median, and drop to at-grade. The alignment would continue in the median of I-5 generally at the level of the southbound I-5 lanes, north to approximately 212th Street SW.

This alternative has an optional four-level parking garage on the existing Mountlake Terrace Transit Center surface lot to the east of the current garage, adding 280 stalls to the current 880.

Alternative B2A: East Side to Mountlake Terrace Transit Center to West Side with 220th Station North Option

Alternative B2A has the same alignment as the Preferred Alternative but would have a 220th Street SW Station above the street (see Figure 2-8), with a 200-stall parking garage to the north. It would require realigning the I-5 on-ramp and off-ramp for 220th Street SW.

Alternative B4: East Side to Mountlake Terrace Freeway Station to Median

Alternative B4 (see Figure 2-8) is the same as the Preferred Alternative from NE 185th Street Station north to approximately the overcrossing at the Lake Ballinger Way/SR 104 interchange. It would then transition to cross over the northbound I-5 lanes to the I-5 median and descend to cross under the 236th Street SW overpass and connect to the existing Mountlake Terrace Freeway Station, which would be extended to the north, retrofitted to accommodate light rail trains, and closed to bus

use. This side platform station would have a south entrance served by the existing pedestrian bridge. A new north entry to the station and pedestrian bridge would connect to the east, crossing over northbound lanes of I-5, with a second tower and pedestrian bridge rising in elevation to connect to 232nd Street SW. The other features of the existing transit center and its 880 parking spaces would be the same as today. The alignment would continue at-grade in the I-5 median to approximately 212th Street SW, similar to Alternative B1.

2.5.3 Segment C: Mountlake Terrace to Lynnwood

The Segment C alternatives involve choices for different routes to reach the Lynnwood Transit Center, as well as different station siting and park-and-ride configurations. These alternatives are shown in Figure 2-9 and Figure 2-10.

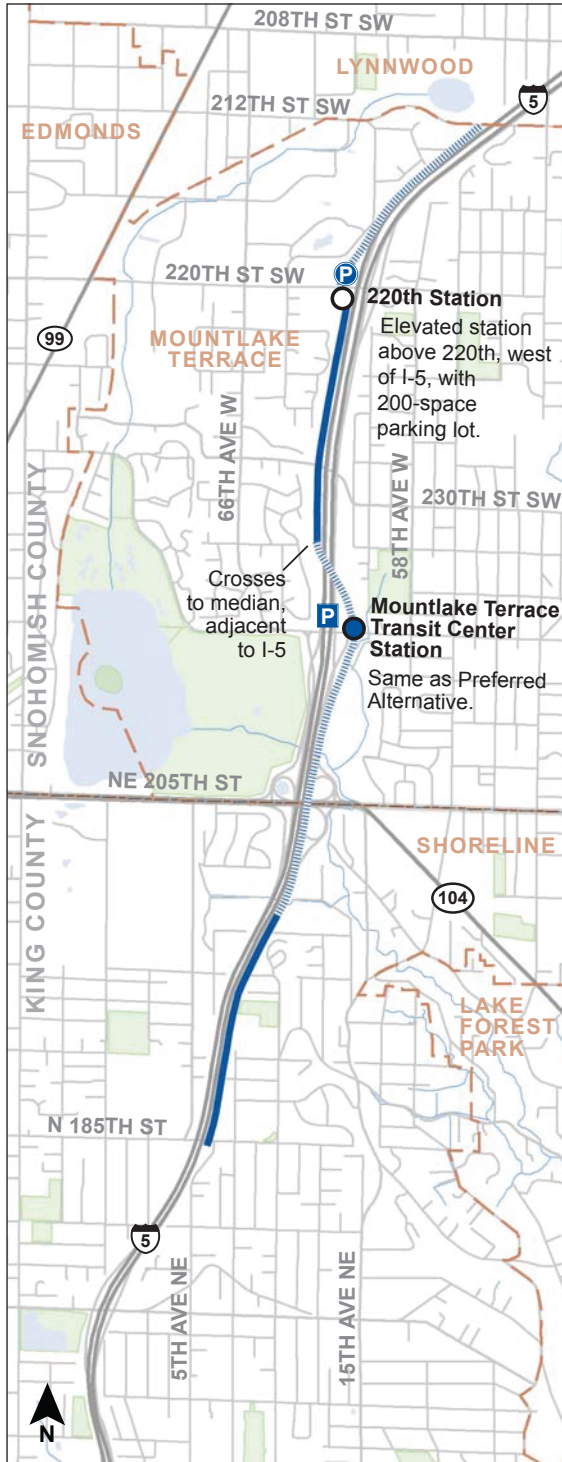
Preferred Alternative: West Side to Lynnwood Transit Center Station

The Preferred Alternative (see Figure 2-9) is a modified version of Alternative C3. It realigns the guideway and station to better connect to the Lynnwood Transit Center, preserve more redevelopable area, and minimize wetland and stream impacts to the extent feasible.

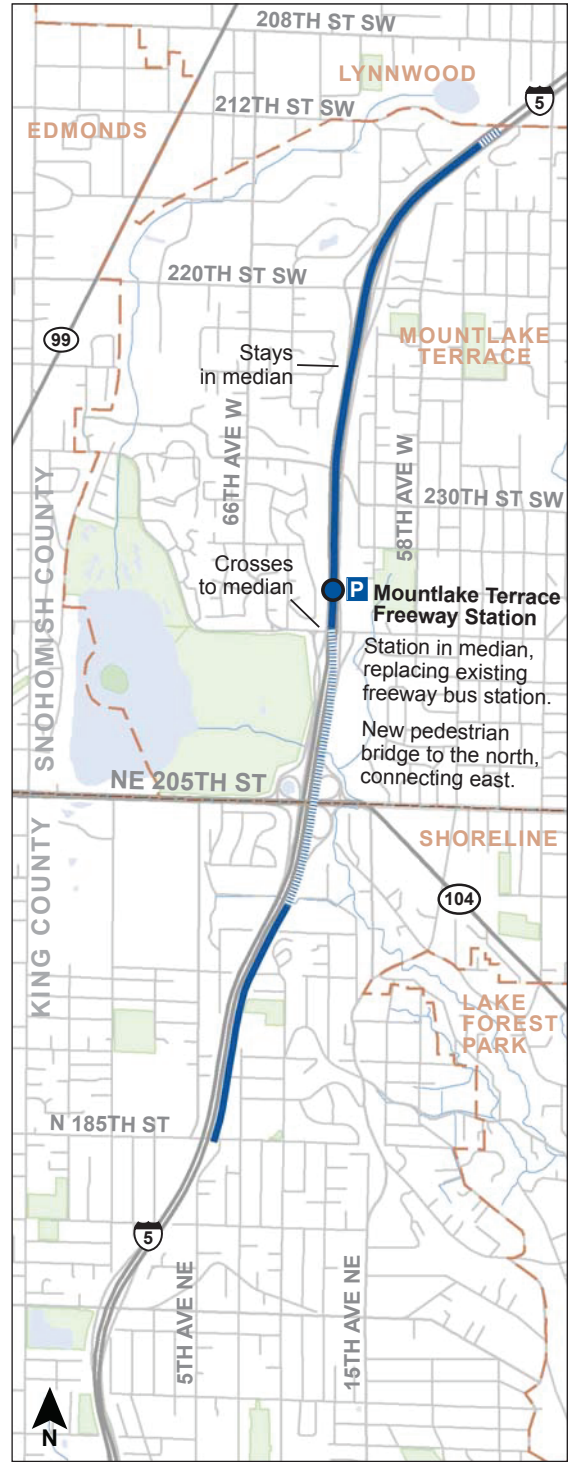
From Segment B, where it would already be elevated on the west side of I-5, it would shift away from I-5 north of 208th Street SW. At about 208th Street SW, the route would cross the Interurban Trail right-of-way and then head generally north toward the south side of the existing transit center. The station would be over 48th Avenue SW, and cross diagonally into the block bounded by 44th Avenue West, 48th Avenue West, and 200th Street SW. Crossover tracks and a trail track would curve eastward to align with 200th Street SW, cross over 44th Avenue West, and end, still elevated, on the south side of Alderwood Mall Boulevard.

A parking garage (up to four levels) would be built partly over an existing park-and-ride lot between the HOV direct access ramps (to the west) and 44th Avenue West (to the east). It would connect to the station as well as the existing bus transit center to the west of 48th Avenue NE. The 1,650-space garage would replace current parking spaces and add approximately 500 new spaces, for a total park-and-ride capacity of about 1,900 spaces. An existing park-and-ride lot north of the current transit center would be repurposed to provide bus layover and circulation. To provide effective access to the station, 200th Street SW and 48th Avenue West would be widened, and 46th Avenue West would have HOV-only restrictions.

An option for the Preferred Alternative would maintain 400 spaces on the existing surface parking lot to the south of the existing transit center, rather than converting the area for bus layover and circulation, for a total of 2,300 parking spaces at the park-and-ride. Bus layover and circulation would instead occur just north of the transit center.



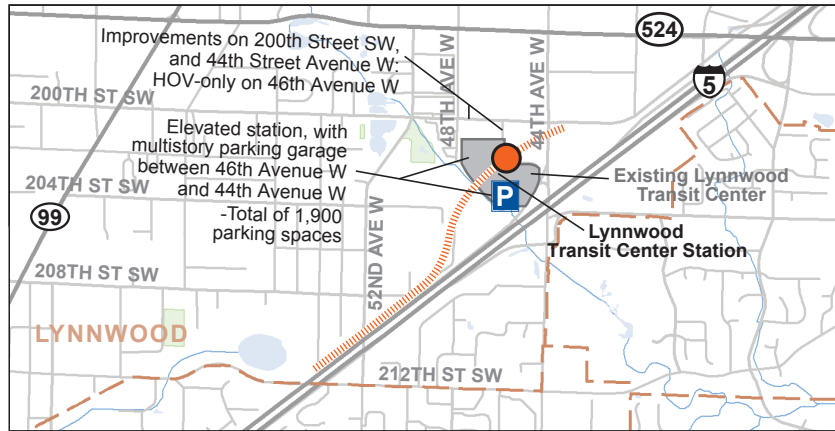
B2A: EAST SIDE TO MOUNTLAKE TERRACE TRANSIT CENTER TO WEST SIDE WITH 220TH STATION NORTH OPTION



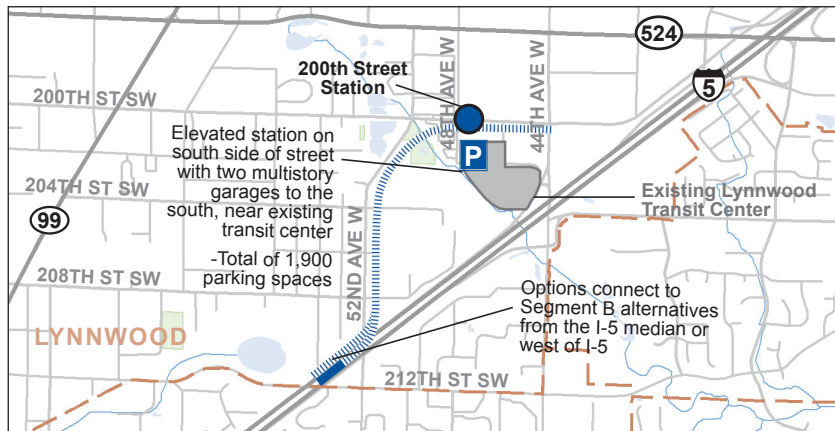
B4: EAST SIDE TO MOUNTLAKE TERRACE FWY STATION TO MEDIAN

- | | | | |
|--|-------------------|--|-----------------|
| | Elevated | | Roadway |
| | At-Grade | | Local Street |
| | Station | | City Boundary |
| | Station Option | | County Boundary |
| | Parking Structure | | Park |
| | Surface Parking | | Waterbody |

Figure 2-8
Alternatives B2A and B4



**PREFERRED ALTERNATIVE SEGMENT C:
WEST SIDE TO LYNNWOOD TRANSIT CENTER STATION**



C1: 52ND AVE WEST TO 200TH STREET STATION













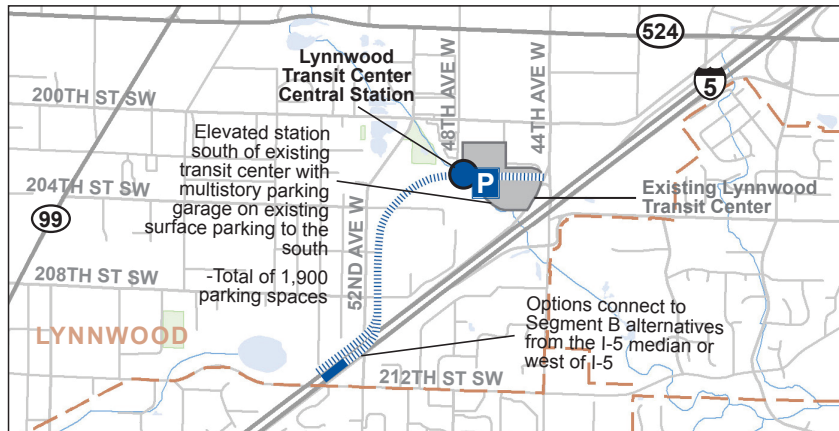
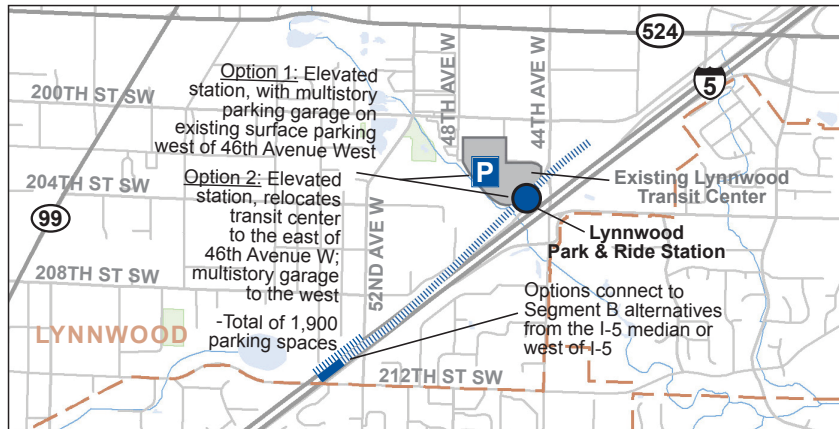
- | | |
|---|---|
|  Elevated |  Roadway |
|  At-Grade |  Local Street |
|  Station |  City Boundary |
|  Station Option |  County Boundary |
|  Parking Structure |  Park |
|  Surface Parking |  Waterbody |

Figure 2-9
Preferred Alternative and Alternative C1



C2: 52ND AVE WEST TO LYNNWOOD TRANSIT CENTER STATION



C3: ALONG I-5 TO LYNNWOOD PARK & RIDE STATION













- | | |
|---|---|
|  Elevated |  Roadway |
|  At-Grade |  Local Street |
|  Station |  City Boundary |
|  Station Option |  County Boundary |
|  Parking Structure |  Park |
|  Surface Parking |  Waterbody |

Figure 2-10
Alternatives C2 and C3

Alternative C1: 52nd Avenue West to 200th Street Station

Alternative C1 (see Figure 2-9) begins with two alignment options to connect with Segment B alternatives. Alignment Option 1 connects to the I-5 median (to Alternative B1 or B4). After crossing the I-5 southbound lanes, it would remain elevated along the east side of 52nd Avenue West and Cedar Valley Road.

Alignment Option 2 would continue elevated on the west side of I-5 (connecting to the Preferred Alternative and B2A) to 52nd Avenue West, before turning north and crossing over the Interurban Trail. Alternative C1 would then turn east over the corner of Scriber Creek Park and along the south side of 200th Street SW and arrive at the elevated 200th Street SW Station, east of 48th Avenue West.

South of the station, two new two-story parking garages would increase the existing parking by 500 spaces for a total of 1900 spaces. Elevated tail tracks would continue approximately 800 feet east to 44th Avenue West.

Alternative C2: 52nd Avenue West to Lynnwood Transit Center Station

Alternative C2 (see Figure 2-10) and its options are the same as Alternative C1 until crossing over the Interurban Trail around 208th Street SW. As Alternative C2 approaches 204th Street SW, it would turn northeast on an elevated guideway and cross south of Scriber Creek Park to the Lynnwood Transit Center Station. This elevated, center platform station would be south of 48th Avenue NW and the existing Lynnwood Transit Center. A new, approximately 1,200-space parking garage (up to four levels) would replace the surface lot spaces displaced by the station and increase the existing park-and-ride capacity by 500 spaces, for a total of about 1,900 spaces. Tail tracks, with a crossover track, would extend 800 feet beyond the station to 44th Avenue West.

Alternative C3: Along I-5 to Lynnwood Park-and-Ride Station

Alternative C3 also features two options for connections to Segment B alternatives (see Figure 2-10). Alignment Option 1 would continue northward along I-5 at-grade in the median (matching Alternative B1 or B4), transition to an elevated guideway at about 208th Street SW, and then cross over the southbound I-5 lanes and angle away from I-5. Alignment Option 2 would already be elevated on the west side of I-5 (matching Alternative B2 or B2A) and more gradually shift away from I-5 north of 208th Street SW. At 208th Street SW, the Alternative C3 route would cross the Interurban right-of-way and parallel I-5 to the Lynnwood Park-and-Ride Station south of 48th Avenue SW and east of the existing Lynnwood direct access ramp.

Two design options are being considered for the Lynnwood Park-and-Ride Station. Both of these options feature an elevated, center platform station west of the Interurban Trail. The station would include a parking garage (up to four levels) to the west, south of the existing transit center, which would replace current spaces and add approximately 500 new spaces, for a total park-and-ride capacity of about 1,900

spaces. Both design options also feature a guideway containing tail tracks extending about 800 feet northeast over 44th Avenue West.

With Station Option 1, the existing transit center would remain at its current location. The elevated, center platform station would have surrounding open spaces, as well as a large plaza area with a pathway to the northwest toward the existing transit center.

Station Option 2 would be the same except that the existing transit center with 20 bus bays would be relocated adjacent to the light rail station, with transit driveways on and off of 48th Avenue NW, which would be converted to transit-only access.

2.5.4 Light Rail Operations

The light rail alternatives would operate consistent with Sound Transit's current long-range Link service plan, which accommodates the Lynnwood Link Extension and other planned light rail expansions through 2030. Sound Transit would run weekday revenue service with four-car trains at the scheduled frequency shown in Table 2-2.

Table 2-2. Operating Plan for Weekday Service^a

Service Period	Hours	Train Frequency
Early Morning	5:00 am to 6:00 am	7.5 minutes
Morning Peak	6:00 am to 8:30 am	4 minutes
Midday	8:30 am to 3:00 pm	5 minutes
Afternoon Peak	3:00 pm to 6:30 pm	4 minutes
Evening	6:30 pm to 10:00 pm	5 minutes
Evening Late Night	10:00 pm to 1:00 am	7.5 minutes

^a Sound Transit also runs several non-revenue trains before and after the service day for maintenance and operation purposes.

2.5.5 Construction Approach

Pre-construction investigations during final design would include geotechnical and/or exploratory investigations to detect unmapped utilities, culverts, or other infrastructure. Some advance utility upgrades or relocations would also occur. Project construction and pre-operations testing activities would last approximately 6 years overall, but in many locations the major construction activities would last about 2 years. Although more detail on the specific construction approaches and methods would be developed when the project enters final design, this Final EIS impact analysis covers the most likely major activities, as described below.

Sound Transit would need several sites to stage construction activities. These areas would have a range of activities and uses, such as construction office trailers; temporary storage of demolition materials for salvage, sorting, and recycling; and

excavated soils storage. Staging areas would also be used to load and unload trucks, store equipment and materials, and allow parking for construction workers. Sound Transit would need access routes for construction areas not readily accessible from existing roadways. Where possible, Sound Transit would locate construction activities on staging areas proposed for use by light rail (some of which is WSDOT right-of-way). Some of these sites may require vegetation removal, clearing, and grading, as well as temporary retaining structures or barriers. Appendix F, Conceptual Plans, shows anticipated construction staging areas.

Construction activities and their approach vary by the type of light rail facilities to be built for a given alternative. Different approaches would be required for:

- At-grade guideways
- Retained cut and fill guideways
- Elevated guideway structures, particularly structures spanning I-5
- Passenger stations
- Park-and-ride facilities
- Traction power substations, and communications and signal control facilities
- Other related improvements such as roadways, sidewalks, noise walls, utility relocations, and drainage and stormwater facilities
- Power transmission line relocations

The first phase of any construction work begins with site preparation. This would include erosion, sediment, and stormwater control measures; sensitive-area protection measures; demolition of structures; and re-routing of utilities. Next, construction of the alignment begins, followed by installation of the guideway. Stations and parking facilities can be constructed concurrently with the guideway if those sites are not needed for staging areas.

Construction activity would be highest during the heavy civil construction period of the project. Elevated guideways, station areas, earthwork, and retaining wall construction typically generate the most intense construction activity because they require greater volumes of materials, equipment, and personnel. Station finishes, system installation, and testing, would be less intense, confined to smaller areas, and generally involve fewer workers.

Sound Transit typically constructs guideways and stations in segments in a linear fashion. In any given location, most of the major civil construction activities would be completed in one year, although stations, park-and-rides, and complex sections can take longer. Sound Transit would avoid major construction late at night, early mornings, and on weekends, as practicable, but some locations and types of work might require exceptions. Elevated guideways and bridges over other roadways are

types of construction that would typically require major construction at night or early mornings on the weekends, largely to minimize traffic impacts. Partial or full street closures as well as potential I-5 lane closures are possible. These temporary closures are discussed in more detail in Chapter 3, Transportation Impacts and Mitigation. Throughout construction, Sound Transit would coordinate closely with local jurisdictions, FHWA and WSDOT, affected residents and neighborhoods, affected commercial and industrial businesses, utility providers, institutions, and other affected local and state agencies to help minimize impacts and disruptions or inconveniences.

As construction is completed, control systems would be installed and tested. Once those are tested and commissioned, the transit system opens to riders.

Potentially Deferred Stations

The Preferred Alternative has options for stations at NE 130th Street and 220th Street SW. If these stations were added to the project, they could be completed with initial construction, or they could be deferred and completed in the future. A deferred station would require some initial station construction activities prior to the opening of the line, followed later by the construction of the balance of the station. Elevated stations have the largest percentage of work that could be deferred to a future stage. In all cases, enough of the station structure must be completed initially so that future construction to complete the station can proceed without interfering with normal operation of the light rail line. Construction activities and impacts would be split into two periods in this case.

2.6 Alternatives Development

Sound Transit developed the alternatives being considered in this Final EIS through a public planning process that dates back many years. The ST2 Plan, financing for which was approved by voters in 2008, was a major step in defining the general scope for a project connecting Northgate to Lynnwood. ST2 defined the project as part of a larger program to expand the regional mass transit system in Snohomish, King, and Pierce counties.

The start of the EIS phase for the Lynnwood Link Extension was built on ST2 planning and the results of an Alternatives Analysis Sound Transit performed in 2010 and 2011 that included early public and agency scoping, which began in October 2010. The Alternatives Analysis considered a broad range of alternatives in order to comply with the federal regulations and guidelines then in place for projects seeking funding from FTA's New Starts program. It resulted in the September 2011 North Corridor Transit Project *Alternatives Analysis Report and SEPA Addendum* (Sound Transit 2011a) (attached as Appendix K to this Final EIS) that identified the most promising alternatives for further study, as well as serving as an addendum to Sound Transit's 2005 *Supplemental EIS on the Regional Transit Long-Range Plan*. The

Alternatives Analysis Report and SEPA Addendum reviewed the project corridor's long planning history and considered in detail a wide range of alternatives and their performance. The North Corridor Transit Project *Environmental Scoping Information Report* summarized the process and its conclusions. Both documents were available during public scoping for the Draft EIS.

Through several stages of detailed study in the Alternatives Analysis, Sound Transit evaluated light rail, bus rapid transit, and transportation systems management alternatives. Sound Transit weighed each alternative's ability to meet the project's purpose and need, considering factors such as ridership and transportation performance, land use, community equity, environmental effects, total cost, cost effectiveness, and constructability. The final set of alternatives considered in the Alternatives Analysis featured an I-5 light rail alternative, two SR 99 alternatives (one with at-grade sections and one fully elevated), and a three-prong bus rapid transit alternative running on I-5, SR 99, and 15th Avenue NE. The final evaluation showed the light rail alternatives would have nearly twice the ridership of the bus rapid transit alternative. Light rail had higher capital costs than bus rapid transit, but would perform better in terms of cost per rider and annual operating costs. Finally, the bus rapid transit alternative had less capacity, and gaps in the HOV system from Northgate to downtown Seattle made it less reliable. The SR 99 alternatives produced more severe impacts and less transportation benefit, and had more constructability issues.

Figure 2-11 charts the alternatives evaluation and screening process and identifies the alternative concepts that were not advanced from the Alternatives Analysis through the start of the Draft EIS. Table 2-3 describes why specific alternatives considered for the Draft EIS were eliminated from consideration.

The Alternatives Analysis found that light rail must operate in an exclusive right-of-way with full separation from other traffic in order to provide the capacity, reliability, and travel time savings needed to address the growing demand for mass transit in the project corridor.

As a result, Sound Transit concluded that light rail along the I-5 corridor would offer the best overall performance across the broad set of evaluation criteria, including ridership and transportation performance, consistency with regional land use plans, and cost-effectiveness.

After the public scoping comment period, the Sound Transit Board reviewed the comments received and the *Alternatives Analysis Report and SEPA Addendum*. In December 2011, the Sound Transit Board approved Motion M2011-87, which directs Sound Transit to study light rail alternatives along I-5 in the EIS and removed the other modes and corridors considered in the Alternatives Analysis from further study. This included routes and stations along SR 99 and 15th Avenue NE, bus

Alternatives Analysis

Draft EIS

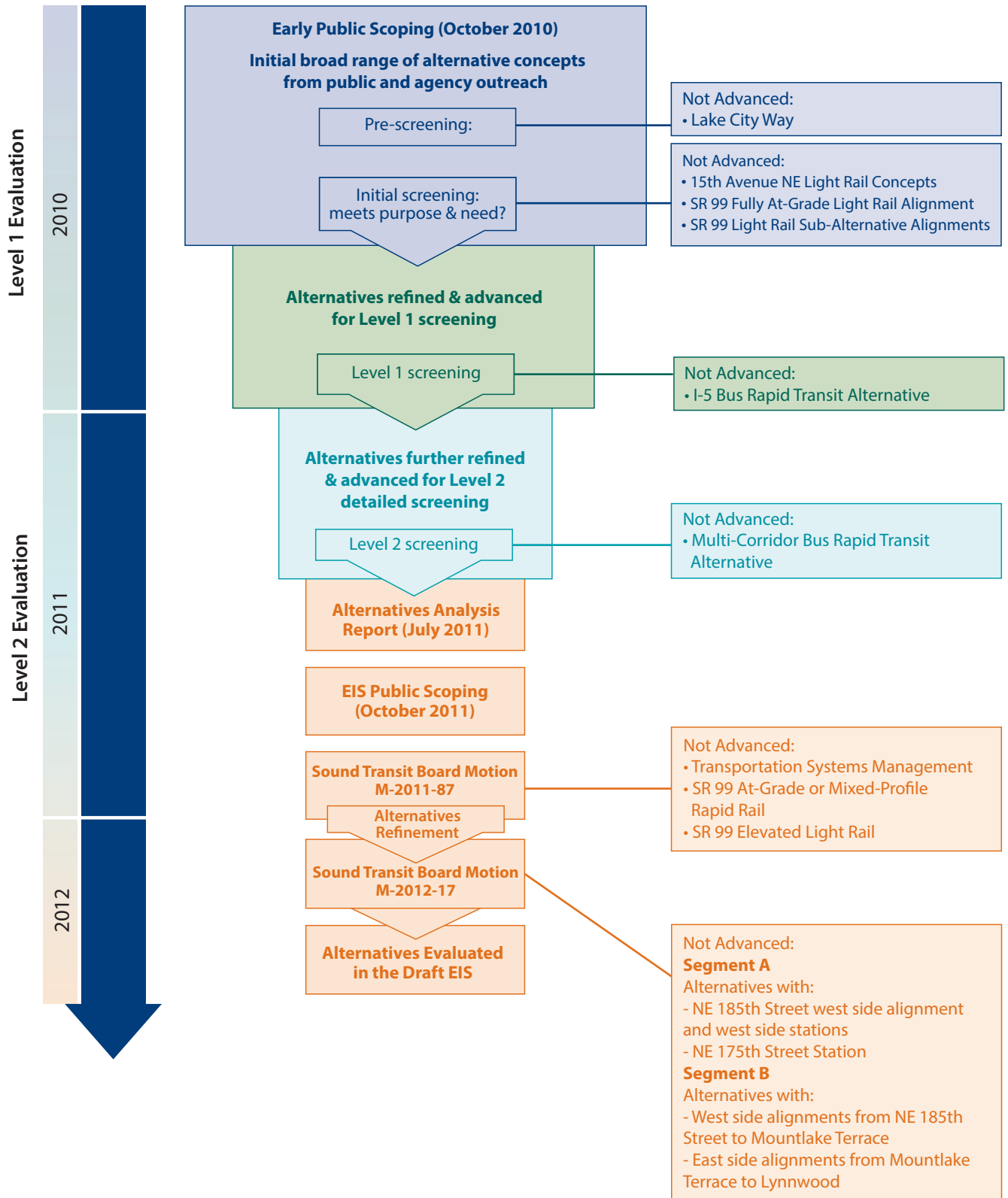


Figure 2-11
Alternative Evaluation and Screening Summary

Table 2-3. Alternatives Eliminated by Sound Transit Board

Alternative	Areas of Poor Performance
A2: At-Grade/Elevated to NE 145th East Side and NE 185th West Side Stations	<p>Environmental Effects: Higher potential for visual and historic impacts; west side alignment increases impacts into Segment B</p> <p>Constructability: Substantially more difficult due to staging constraints and traffic impacts related to crossing I-5; adds another I-5 crossing in Segment B</p>
A4: Mostly Elevated to NE 145th East Side and NE 185th West Side Stations	<p>Environmental Effects: Higher potential for visual and natural resources impacts; west side alignment increases impacts into Segment B</p> <p>Constructability: Substantially more difficult due to staging constraints and traffic impacts related to crossing I-5; adds another I-5 crossing in Segment B</p>
A6: At-Grade/Elevated to NE 130th and NE 155th East Side and NE 185th West Side Stations	<p>Environmental Effects: Higher potential for historic and visual impacts; west side alignment increases impacts into Segment B</p> <p>Constructability: Substantially more difficult due to staging constraints and traffic impacts related to crossing I-5; adds another I-5 crossing in Segment B</p>
A8: Mostly Elevated to NE 130th and NE 155th East Side and NE 185th West Side Stations	<p>Environmental Effects: Higher potential for noise, historic, and visual impacts; west side alignment increases impacts into Segment B</p> <p>Constructability: Substantially more difficult due to staging constraints and traffic impacts related to crossing I-5; adds another I-5 crossing in Segment B</p>
A9: At-Grade/Elevated to 145th and 175th East Side Stations	<p>Transportation Performance: Slower bus and auto travel times due to higher congestion at interchange, lower levels of bus access, and less desirable pedestrian and bicycle environments</p> <p>Environmental Effects: Higher congestion due to park-and-ride at an interchange; property and visual impacts to residential areas</p> <p>Constructability: More complex construction due to proximity with interchange</p>
B3: East Side to Mountlake Terrace Transit Center to East Side	<p>Environmental Effects: Higher potential for noise, visual, and ecosystems impacts due to section located through a greenbelt</p> <p>Right-of-Way Implications: More properties needed outside of I-5 right-of-way</p>
B5: West Side to Mountlake Terrace Freeway Station to Median	<p>Transportation Performance: Increased walk distance between station platform and parking/bus transfer at Mountlake Terrace; worse platform waiting environment</p> <p>Ridership Potential: Reduced due to longer walk distance</p> <p>Environmental Effects: Higher potential for visual and ecosystems impacts along west side from NE 185th and from second pedestrian bridge</p> <p>Constructability: Substantially more difficult due to necessary design deviations, reduced speeds, and median construction for proposed Mountlake Terrace freeway station</p>
B6: West Side to Mountlake Terrace Transit Center to Median	<p>Environmental Effects: Higher potential for visual impacts from sections along the west side of I-5 and at transition to the east side approaching Mountlake Terrace Transit Center</p> <p>Constructability: Substantially more difficult due to staging constraints and traffic impacts related to crossing I-5</p> <p>Right-of-Way Implications: Higher potential for property impacts from the west-to-east I-5 crossing</p>
B7: West Side to Mountlake Terrace Transit Center to West Side	<p>Environmental Effects: Notably higher visual impacts along west side from NE 185th Street; higher ecosystems and noise impacts due to transition back to west side and along greenbelt; higher ecosystems impacts near S. 212th Street</p> <p>Constructability: Substantially more difficult due to additional crossing of I-5</p> <p>Right-of-Way Implications: More properties needed outside of I-5 right-of-way</p>
B7A: West Side to Mountlake Terrace Transit Center to West Side with 220th Street Station	<p>Environmental Effects: Notably higher visual impacts along west side from NE 185th Street; higher ecosystems and noise impacts due to transition back to west side and along greenbelt; higher ecosystems impacts near S. 212th Street; potential for historic impacts due to 220th Street Station</p> <p>Constructability: Substantially more difficult due to additional crossing of I-5</p> <p>Right-of-Way Implications: More properties needed outside of I-5 right-of-way</p>
B8: West Side to Mountlake Terrace Transit Center to East Side	<p>Environmental Effects: Notably higher visual and ecosystems impacts along west side from 185th; higher visual, ecosystems, and noise impacts due to transition across I-5 and along greenbelt</p> <p>Constructability: Substantially more difficult due to additional crossing of I-5</p> <p>Right-of-Way Implications: More properties needed outside of I-5 right-of-way</p>

rapid transit, and extensions beyond the Lynnwood Transit Center. Light rail routes along SR 99 and 15th Avenue NE were eliminated because the Alternatives Analysis showed operating in mixed traffic would result in insufficient capacity, slow average speeds, and low reliability. Routes along SR 99 and 15th Avenue NE would not provide the type of regional service identified in the Sound Transit Long-Range Plan nor would the routes meet the project's purpose and need related to transportation effectiveness. Scoping comments from the public and agencies strongly supported further study of I-5 light rail alternatives, and not of the other modes.

Some comments received during scoping suggested different alternatives and/or station locations than those presented by Sound Transit. Sound Transit incorporated some of these suggestions into the alternatives evaluated in this EIS, such as NE 130th Street, NE 155th Street, and 220th Street SW stations. Other suggestions were not advanced because they were not consistent with the project's purpose and need or they would have lower effectiveness and higher environmental impacts. These suggestions are summarized in Table 2-4.

2.6.1 Factors Affecting the Range of Alternatives

In addition to Sound Transit's standard design considerations for light rail projects, several general planning, engineering, and environmental considerations shaped the development of alternatives for connecting Northgate and Lynnwood, from ST2 planning through to the alternatives evaluated in this EIS. These factors reflect the constraints posed by I-5 and its limited available right-of-way, as well as other community and environmental conditions along the project corridor.

- **Develop Alignment and Station Combinations that Minimize Environmental Impacts.** The general route and the specific alternative alignments were developed considering the location of the candidate station sites, along with environmental resources, such as major streams and wetlands, as well as built environment elements such as historic properties, parks, neighborhoods, and community facilities. The routes also maximized the potentially available transportation right-of-way from I-5 and adjacent city streets while maintaining the overall transportation utility of the I-5 right-of-way as a public asset.
- **Avoid the Impacts of Repeated I-5 Crossings.** I-5 crossings require costly crossing structures and cause higher impacts on properties and environmental resources near the freeway, as well as on I-5 operations and maintenance.

Table 2-4. Other Alternatives Suggested During Environmental Scoping

Suggested Alternatives	Reason Not Advanced
Consider stations along 15th Avenue NE at NE 145th Street and NE 175th Street.	15th Avenue NE alignment was removed because it would have higher environmental impacts and lower effectiveness; the narrow avenue along a developed corridor would not accommodate the stations and access levels needed to support the regional service identified in Sound Transit's Long-Range Plan.
Extend light rail to Alderwood Mall, Lynnwood Convention Center, 196th Street, Lynnwood City Center, or Ash Way, to serve more commuters or reduce traffic	An extension could be part of the future project, but it is not consistent with the current project scope, budget, or purpose and need. The project's limits from Northgate to the Lynnwood Transit Center were adopted by the Sound Transit Board and financing was approved by the voters in the region with the passage of the ST2 ballot measure in 2008.
Use Interurban Trail land for alignment.	The former Interurban right-of-way serves as a primary corridor for high voltage electrical transmission lines, and it has been developed as a trail for pedestrians and bicycles. These uses together with numerous areas where development has encroached on the right-of-way make it very difficult to integrate a light rail line without relocating the power lines, portions of the trail, and increasing environmental impacts compared to other available alternatives evaluated in the EIS.
Rebuild Northgate Park-and-Ride in the manner of Hammersmith Station in London with better connections, mixed uses, and amenities.	The Northgate Station is part of the Northgate Link Extension project, which has completed its environmental review process and is now under construction. The Northgate Station is not part of the Lynnwood Link Extension.
Consider staggered stops, run more trains but skip some stations.	Lynnwood Link is an extension of a 2-track line from Northgate that passes through the Downtown Seattle Transit Tunnel. The tunnel must accommodate operations of the light rail network that will extend from Federal Way on the south, Redmond on the east, and Lynnwood on the north. While a skip stop operation between Northgate and Lynnwood might reduce travel times in this section by 90 to 120 seconds, it would significantly increase capital costs and right-of-way needs. In addition, more frequent train service would also tax operations through the Downtown Seattle Transit Tunnel.
Consider a mix of express bus on I-5 between Lynnwood and Northgate, in combination with a limited stop light rail route using SR 99 to connect Lynnwood to Northgate.	An SR 99 alignment as well as the use of express bus or Bus Rapid Transit as modes were removed because they would not provide the levels of speed, reliability, and capacity needed to make effective regional connections as envisioned in Sound Transit's Long-Range Plan.

- Maximize the Advantages in Existing Transit Infrastructure in Potential Station Sites.** Siting stations at or near existing transit facilities makes efficient use of existing investments and optimizes connections between light rail and local bus services. Light rail stations need a section of straight and level track to hold four-car trains, which are 380 feet long. Station sites also need to be accessible, and ideally would provide opportunities for transit-oriented development.
- Maximize the Advantages of Existing Transportation Rights-of-Way.** A light rail route along I-5 provides certain environmental and cost advantages over routes in entirely new rights-of-way. Sound Transit and WSDOT collaborated to identify where Sound Transit could reasonably anticipate using I-5 ROW for light rail without impacting WSDOT's ability to make future highway improvements, and without significant safety, maintenance, or operational impacts, consistent with FHWA regulations. They considered highway and light rail design standards, as well as safety and operation and maintenance needs for the highway. These efforts produced the *I-5 Light Rail Compatibility Report* (Sound Transit 2012) (attached as

Appendix Q to this Final EIS), which is the basis for the conceptual engineering of the Draft EIS alternatives and their assumptions about using WSDOT's right-of-way. Ultimately, FHWA must approve the project's use of the I-5 right-of-way.

In each of the three project segments, the range of alternatives Sound Transit considered reflects the above factors. In Segment A, for instance, all the alternatives evaluated in this EIS are on the east side. This is partly because the I-5 right-of-way is very limited on the west side in Segment A, and Sound Transit found more areas on the east side where rights-of-way for I-5 and local streets could be combined to accommodate light rail. This helped reduce comparative environmental impacts. In addition, the existing Northgate Transit Center requires the project to start on the east side of I-5, and there were more potential station sites with existing infrastructure, access, and available rights-of-way on the east side from Northgate up to nearly NE 175th Street.

Also, the west side has more parks that could be affected, such as Northacres Park, Twin Ponds Park, and Ronald Bog Park. Several of these parks contain streams and wetlands, and Thornton Creek also runs adjacent to I-5 between NE 145th Street and NE 163rd Street.

Overall, alignments on the east side of I-5 have more advantages and would have fewer impacts than west side alignments or east-west crossings. Potential west side or east-west crossing alternatives would result in higher costs, environmental impacts, and operating concerns.

During the alternatives development, Sound Transit again applied its design standards and reviewed operating, impact, and cost factors to develop and refine alternatives. For example, Segment A at NE 155th Street, Sound Transit modified the siting of a parking garage for Alternatives A5 and A7 to avoid affecting a historic home. In Segment B, it modified Alternatives B2 and B2A on the west side of I-5 to avoid affecting a historic school.

In Segment C, Sound Transit considered a variety of station and alignment concepts before defining the Segment C alternatives in this EIS. These concepts included alternatives that bisected more of the Scriber Creek wetland area, crossed nearer to Scriber Creek Park, occupied more area of the Edmonds School District site, or placed stations and tail tracks in areas requiring more properties. Sound Transit also reviewed the estimated costs, effectiveness, and impacts with cooperating agencies, including the City of Lynnwood, for all alternatives.

2.6.2 Developing Details of the Alternatives

After the Alternatives Analysis, Sound Transit defined a more detailed range of potential alignment and profile alternatives along the I-5 corridor. The Alternatives Analysis examined only a representative I-5 alternative and route that featured four stations. Sound Transit explored a variety of station and alignment design and siting choices along the I-5 corridor from Northgate to Lynnwood. The concepts reflected public and agency comments and suggestions made during the environmental scoping comment period. Sound Transit also developed alignment, profile, and station siting concepts by working with local jurisdictions and WSDOT.

After developing several I-5 alternative concepts, Sound Transit evaluated how well these various concepts addressed the project's purpose and need and how they affected constructability, impacts, and costs (the same factors considered during the Alternatives Analysis). Other evaluation criteria considered consistency with the approved ST2 program, station access needs, development constraints, Sound Transit policies, and design guidance.

Definition of EIS Alternatives by Geographic Segment

From the I-5 corridor alternative concepts, Sound Transit developed a range of potential Draft EIS alternatives in three segments from Northgate to Lynnwood, and presented them in a draft Sound Transit Board Briefing Book in March 2012. The Sound Transit Board members suggested other alternatives and variations, and Sound Transit completed a Final Board Briefing Book in April 2012 (included in Appendix K, Supporting Documents). The Briefing Books, which were publicly available, evaluated each alternative under consideration.

After reviewing the Briefing Book and public comments, the Sound Transit Board passed Motion M2012-17 regarding the alignment and station alternatives to be considered in the Draft EIS. It removed a number of the potential alternatives from further consideration based on their higher impacts, costs, and/or lower benefits when compared to other alternatives (see Figure 2-11). The Board added a few alternatives that offered different pairings of alignments and stations for consideration. The alternatives identified in Motion M2012-17 were analyzed in the Draft EIS.

After the publication of the Draft EIS and the close of the public comment period, the Sound Transit Board considered the Draft EIS information, public comments received, and supporting briefing materials. With Motion M2013-96, the Board identified a Preferred Alternative for evaluation in the Final EIS and requested that staff consider options and modifications to the Preferred Alternative and other alternatives. Section 2.4 describes the resulting range of light rail alternatives.

Draft EIS Public and Agency Comments Suggesting New or Modified EIS Alternatives

Before preparing the Final EIS, Sound Transit reviewed comments on the Draft EIS that suggested modifying the alternatives or adding other alternatives. Many of these comments focused on station area elements and features, particularly measures that would improve multimodal access. The conceptual design plans for the Preferred Alternative reflect some of these suggestions, and might be integrated during final design.

Other comments suggested moving the alignments to the west side of I-5 in Segment A, which was already considered in earlier planning but not advanced due to environmental, design, and station siting constraints, as described in Section 2.6.1. Other comments suggested lids or tunnels to allow light rail to run under or above I-5, which was not considered further due to high construction impacts to I-5. A number of comments suggested designing the stations to specifically accommodate transit-oriented development, including developments above the stations; in station locations outside the I-5 right-of-way, such opportunities to accommodate other developments would remain available to the project, but would require partnerships with developers before more specific designs would be developed. A few parties suggested widening roadways such as NE 145th Street or at 200th Street SW. The project includes specific intersection improvements; however, its traffic impacts do not warrant major widenings. Other suggestions, such as a median station at 220th Street SW, a modified station at NE 155th Street, or a station at NE 175th Street, had been previously considered but were not advanced because other alternatives with lower impacts and higher benefits were available.

In Segment C, the City of Lynnwood suggested a “C3 Modified,” which Sound Transit and the City collaborated to refine, resulting in what is now the Segment C Preferred Alternative. The Pilchuck Audubon Society suggested Sound Transit extend the route farther along I-5 before shifting to the Lynnwood Transit Center or Alderwood Mall to avoid impacts on Scriber Creek Park and the adjacent stream and wetland complex. This suggestion was not incorporated because of conflicts with existing freeway direct access ramps and related design and engineering challenges.

More details on specific comments and Sound Transit’s responses are provided in Appendix P, Draft EIS Public Comments and Responses.

2.7 Environmental Practices and Commitments

As an agency that has built and operated light rail, commuter rail, and regional express bus service in multiple Puget Sound communities, Sound Transit has established programs, best practices, and policies that are incorporated as part of the Lynnwood Link Extension. These include the agency’s sustainability and environmental management programs (as outlined in Sound Transit’s Sustainability Plan), along with

Sound Transit's design standards for light rail, its commitment to work collaboratively with other jurisdictions, and its commitment to obtain and comply with all required permits and approvals needed for construction and operation.

2.8 Estimated Project Costs

With seven alternatives in Segment A, four in Segment B, four in Segment C, and options for many alternatives, there are many possible segment combinations that could create the full 8.5-mile light rail extension from Northgate to Lynnwood. The Preferred Alternative's estimated capital costs are \$1.5 billion to \$1.7 billion. The other possible combinations have total capital costs that range between \$1.4 billion and \$2.0 billion. The Preferred Alternative is estimated to cost about \$16 million (2014\$) per year to operate and maintain. Other alternatives would be similar. Chapter 5, Evaluation of Alternatives, has information on estimated project costs by alternative.

2.9 Other Project Area Activities

The Lynnwood Link Extension is being proposed in an area with vibrant, established urban communities. These communities, and the transportation systems that serve them and the region, will continue to change to accommodate additional people and jobs through 2040.

There are no other major transportation projects that would span the full project corridor. However, at the southern end of the project corridor, Sound Transit will open the Northgate Link Extension, with a new light rail station and parking garage, in 2021. Sound Transit is also conducting planning and environmental review for a separate project, the Link Operations and Maintenance Satellite Facility, which includes an alternative in the project corridor (see Section 2.9.1 below). In addition, future tolling along I-5 is possible, and some local transportation projects will be developed nearby.

All of the area jurisdictions have adopted plans that anticipate increased development in the corridor, and some landowners are considering redevelopment actions. Appendix H, Other Projects and Actions Considered in Cumulative Effects, lists the projects considered in the cumulative effects analysis. Chapter 3, Transportation Impacts and Mitigation, and Chapter 4, Environmental Impacts and Mitigation, consider the cumulative effects of the Lynnwood Link Extension in conjunction with these and other plans and projects.

2.9.1 Link Operations and Maintenance Satellite Facility

Sound Transit plans to construct and operate a Link Operations and Maintenance Satellite Facility (OMSF) to support light rail operations and maintenance needs for the ST2 program of projects across the Sound Transit district. Sound Transit and FTA issued a separate NEPA/SEPA Draft EIS for this facility in May 2014 and are

now preparing its Final EIS. The new OMSF would operate in conjunction with Sound Transit's existing Forest Street Operations and Maintenance Facility (OMF) in Seattle to support the 80 additional light rail vehicles required for ST2's expanded system. The Forest Street OMF would continue to provide inspection, heavy repair, and overhaul services, while the OMSF would store, maintain, and dispatch vehicles for daily service.

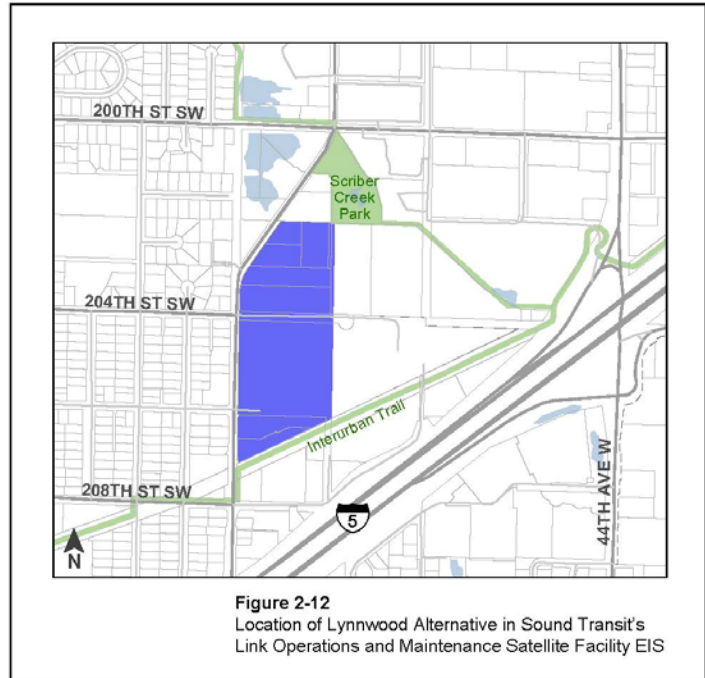
This Lynnwood Link Extension EIS analysis assumes the OMSF along with other ST2 projects, as part of the No Build and all build alternatives. The OMSF is expected to be operating by 2021, before the Lynnwood Link Extension is complete. Even if the Lynnwood Link Extension does not go forward, Sound Transit will construct the OMSF to accommodate other elements of the ST2 Plan. Therefore, the OMSF is related to the Lynnwood Link Extension but it has independent utility under NEPA and SEPA.

Similarly, Sound Transit does not require the OMSF in order to build and operate the Lynnwood Link Extension, although it needs the OMSF to operate at the level of light rail service assumed for the ST2 program. If the OMSF is delayed or not constructed, Link operation and maintenance would occur exclusively at the Forest Street OMF. Thus, the Lynnwood Link Extension has independent utility from the OMSF project. However, Lynnwood Link Extension service levels without the OMSF would be substantially lower than with it. During peak periods, the OMSF would enable four-car trains at 4-minute headways between the Lynnwood Transit Center and International District Station in Seattle. Without the OMSF, the Lynnwood Link Extension would run three-car trains and have longer peak-hour headways.

Lower service levels and reduced capacity could result in overcrowding on trains and platforms and reduced ridership for the Lynnwood Link Extension. However, even with lower ridership, the Lynnwood Link Extension project's impacts would not be notably different than described elsewhere in this EIS. Lower ridership could, however, make the project less competitive for federal Capital Investment Program funding, and would prevent it from realizing its full potential benefits. Appendix R, Link Operations and Maintenance Satellite Facility Analysis, summarizes the potential change in impacts with lower service levels compared to those with the OMSF as assumed in the No Build and light rail alternatives evaluated in this EIS.

The OMSF would require 20 to 25 acres of land to serve the complete ST2 light rail system. The location must be adjacent to an operating line in the north or the east to provide efficient and reliable system-wide service. The OMSF Draft EIS (May 2014) evaluated one alternative in Lynnwood (Figure 2-12) and three alternatives in Bellevue: (see Figure R-1 in Appendix R).

The Lynnwood Alternative is north of I-5, west of the Lynnwood Transit Center, and east of 52nd Avenue West/Cedar Valley Road. It has design options that would match the configuration of any of the Lynnwood Link Extension light rail alternatives. To provide morning service



to the Eastside, this alternative would be paired with a small Bellevue facility called the BNSF Storage Tracks with additional light rail vehicle storage, operator report facilities, and interior cleaning functions for up to 32 vehicles. This would be north of NE 12th Street and south of SR 520 within the Sound Transit-owned portion of the Eastside Rail Corridor and on an adjacent property to the east. The three alternatives in Bellevue, the BNSF Alternative, the BNSF Modified Alternative, and the SR 520 Alternative, are described in Appendix R and shown in Figure R-1 of that appendix.

On July 24, 2014, the Sound Transit Board identified the BNSF Alternative as the Preferred Alternative for evaluation in the OMSF Final EIS along with other alternatives (Motion M2014-51). A final decision on the OMSF site will be made after publication of the project's Final EIS, expected in summer 2015.

Because these two projects have independent utility, this Lynnwood Link Extension EIS describes and summarizes where the impacts of the OMSF alternatives worsen or change the impacts of the Lynnwood Link Extension, just as the EIS analyzes the project's potential impacts in combination with those of other reasonably foreseeable projects in the vicinity. The analysis of potential cumulative impacts of the Lynnwood Link Extension and the OMSF project is based on the OMSF Draft EIS and the Lynnwood Link Extension Final EIS. Appendix R summarizes the potential impacts of all the OMSF alternatives described in the OMSF Draft EIS; that Draft EIS can be found on Sound Transit's website (<http://www.soundtransit.org/Projects-and-Plans/Link-Operations-and-Maintenance-Satellite-Facility>).

2.10 Key Steps for this Project and the EIS

From September 24 through October 27, 2010, Sound Transit and FTA conducted an early scoping process for an Alternatives Analysis for the project; three public meetings were held to provide project information to the public. Early scoping is an optional step in the state and federal environmental review process and is meant to engage the public, agencies, and other stakeholders in the alternatives analysis process, which occurs before defining the alternatives evaluated in the EIS.

A year later, with completion of an *Alternatives Analysis Report and SEPA Addendum* (Sound Transit 2011a), FTA issued the Notice of Intent to prepare an EIS, after which Sound Transit and FTA conducted the environmental scoping process for the EIS from September 30 through October 31, 2011. Environmental scoping is required under SEPA and NEPA and allows the public, agencies, and tribes an opportunity to provide comments on the proposed project alternatives, Purpose and Need Statement, and potential environmental impacts. The comments received during environmental scoping helped Sound Transit and FTA refine the Purpose and Need Statement, define the scope of analysis for this EIS, and identify potential significant impacts resulting from the proposed project. Chapter 6, Public Involvement, provides additional details about the environmental scoping process and outreach for the project to date.

The Draft EIS was released on July 26, 2013, with a 60-day comment period. After considering the analysis in the Draft EIS and the public and agency comments, the Sound Transit Board identified a Preferred Alternative (Motion M2013-96) for evaluation in the Final EIS along with other alternatives. Chapter 6, Public and Agency Involvement, has further details on the Draft EIS public meetings and hearings, as well as other public involvement activities since the publication of the Draft EIS. Chapter 7, Draft EIS Comments and Responses, summarizes the public comments Sound Transit and FTA received, and Appendix P, Draft EIS Public Comments and Responses, provides the detailed comments and responses.

2.11 Next Steps

The Sound Transit Board will consider the analysis in the Final EIS, including public and agency comments and responses, and will then select the project alternative to be built. After the Board's decision, FTA also is expected to publish its Record of Decision (ROD) for the project, which will document findings by FTA that the project has met the requirements of NEPA and related environmental regulations. It will describe FTA's decision on the project, alternatives considered, the basis for the decision to approve the project, and mitigation measures required as conditions of FTA approval.

FTA is directed to issue a combined Final EIS and ROD document pursuant to Public Law 112-141, 126 Stat. 405, Section 1319(b) unless it determines, for statutory criteria or practicability reasons, that separate EIS and ROD documents are appropriate. A

joint Final EIS/ROD is not required when a Draft EIS does not identify a Preferred Alternative, which was the case with the Lynnwood Link Extension Draft EIS. The Lynnwood Link Extension EIS is a joint NEPA and SEPA document consistent with 40 CFR 1506.2(c) and it supports decision-making by Sound Transit, FTA, and other agencies, but the timing of their decisions varies. For example, SEPA requires that the Sound Transit Board's final decision on the project to be built be informed by the Final EIS, and a final decision cannot be made until the Final EIS has been issued. The FTA ROD is required to describe the final project decisions and therefore must be issued after the Sound Transit Board's final decisions on the project. FTA has thus determined it is not practical to issue a combined Final EIS and ROD; these documents are being published separately.

After the Sound Transit Board selects the project to be built and FTA issues a ROD, Sound Transit will initiate final design, begin property acquisition, conduct construction planning, and apply for the other permits and approvals needed to construct and operate the project. This includes the FHWA approvals needed to construct and operate the light rail project within the interstate right-of-way. FHWA is expected to issue its own ROD for the project and can use this Final EIS to help meet other applicable decision requirements. Similarly, the local jurisdictions issuing permits for the project may rely on the Final EIS to help satisfy their SEPA requirements. Final design and permitting is scheduled for 2015 to 2018. Construction of the project is expected to start in 2018 and end in 2023, with service starting in late 2023.

