

# LYNNWOOD LINK EXTENSION

## FINAL ENVIRONMENTAL IMPACT STATEMENT







April 1, 2015

Dear Recipient:

The U.S. Department of Transportation Federal Transit Administration (FTA) and Sound Transit (the Central Puget Sound Regional Transit Authority) have prepared this Final Environmental Impact Statement (Final EIS) on the proposed Lynnwood Link Extension light rail transit project. This project is part of Sound Transit 2, the Regional Transit System Plan for Central Puget Sound. Sound Transit is the project proponent.

The Final EIS has been prepared pursuant to the National Environmental Policy Act (42 U.S.C 4321 to 4370e) and the State Environmental Policy Act (Ch 43.21C RCW). It has been prepared to inform the public, agencies and decision makers about the environmental consequences of building and operating the Lynnwood Link extension of the light rail system from Northgate in Seattle to Mountlake Terrace, Shoreline, and Lynnwood along the Interstate 5 corridor. The Final EIS examines project route and station alternatives, including the preferred alternative identified by the Sound Transit Board.

The major choices for the project involve the route and profile of the light rail line and station locations. The Sound Transit Board will consider the alternatives evaluated in the Final EIS, public and agency comments on the Draft EIS, and other information before selecting the route and station locations to be built. After the Board selects the project to be built, FTA will issue a Record of Decision, which will state FTA's decision on the project and list mitigation commitments to reduce or avoid impacts.

The Final EIS includes a separately bound Summary, appendices, conceptual design drawings, technical reports, background materials, and responses to comments on the Draft EIS. Please see the Fact Sheet of this Final EIS regarding how to obtain these documents and who to contact for further information about the Final EIS.

Sincerely,

Steve Kennedy  
Environmental Manager, Lynnwood Link Extension  
Office of Environmental Affairs and Sustainability

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**LYNNWOOD LINK EXTENSION  
KING AND SNOHOMISH COUNTIES, WASHINGTON  
FINAL ENVIRONMENTAL IMPACT STATEMENT**

Submitted pursuant to  
the National Environmental Policy Act (NEPA) (42 USC 4322(2)(c))  
and the State Environmental Policy Act (SEPA) (Ch. 43.21C RCW)

by the

**U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL TRANSIT ADMINISTRATION**

and

**CENTRAL PUGET SOUND REGIONAL TRANSIT AUTHORITY**

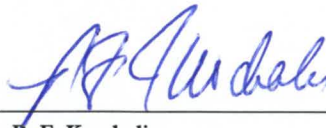
(Sound Transit)

In cooperation with

FEDERAL HIGHWAY ADMINISTRATION  
WASHINGTON STATE DEPARTMENT OF TRANSPORTATION  
U.S. ARMY CORPS OF ENGINEERS  
CITY OF EDMONDS  
CITY OF LYNNWOOD  
CITY OF MOUNTLAKE TERRACE  
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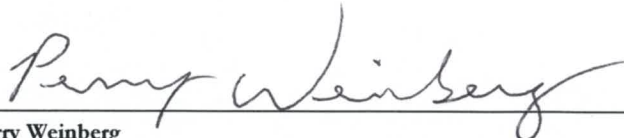
Date of Approval



**R. F. Krochalis  
Regional Administrator  
NEPA Responsible Official  
For Federal Transit Administration, Region 10**

3/16/15

Date of Approval



**Perry Weinberg  
Director, Office of Environmental Affairs and Sustainability  
SEPA Responsible Official  
For Central Puget Sound Regional Transit Authority**



## Fact Sheet

### Proposed Action

The Central Puget Sound Regional Transit Authority (Sound Transit) is proposing to expand the regional light rail system north from Seattle to Lynnwood, Washington. The proposed light rail extension, called the Lynnwood Link Extension (formerly known as the North Corridor Transit Project), would be within the cities of Seattle and Shoreline in King County and in Mountlake Terrace and Lynnwood in Snohomish County. The financing for the proposed project was approved by voters as part of the Sound Transit 2 (ST2) Plan in 2008 (Sound Transit, July 2008).

The proposed project, which is part of a larger regional network of light rail proposed under the ST2 program, would begin at Northgate in north Seattle and end at the Lynnwood Transit Center. The 8.5-mile-long project corridor generally follows Interstate 5 (I-5), which is the major north-south route through the state and serves a large commuter market traveling between Snohomish and King counties. The transportation corridor I-5 serves is bounded by Puget Sound to the west and Lake Washington to the east.

This Final Environmental Impact Statement (EIS) evaluates a No Build Alternative, a Preferred Alternative for light rail, and several other light rail alternatives. The alternatives are arranged in three geographic segments: Segment A—Seattle to Shoreline, Segment B—Shoreline to Mountlake Terrace, and Segment C—Mountlake Terrace to Lynnwood. The Preferred Alternative has both at-grade and elevated sections, with stations at NE 145th Street and NE 185th Street in Shoreline, at 236th Street SW in Mountlake Terrace, and at the Lynnwood Transit Center in Lynnwood. The other light rail alternatives include both at-grade and elevated alignments with different station locations and configurations. In total, seven alternatives are evaluated in Segment A, four alternatives are evaluated in Segment B, and four alternatives are evaluated in Segment C.

### Project Proponent

Central Puget Sound Regional Transit Authority (Sound Transit)  
401 South Jackson Street  
Seattle, Washington 98104-2826  
[www.soundtransit.org](http://www.soundtransit.org)

### Dates of Construction and Opening

Sound Transit plans to begin construction of the Lynnwood Link Extension by 2018, and the light rail line is expected to open in 2023.

## **National Environmental Policy Act (NEPA) Lead Agency**

Federal Transit Administration  
915 Second Avenue, Suite 3142  
Seattle, Washington 98174-1002  
[www.fta.dot.gov/about/region10](http://www.fta.dot.gov/about/region10)

### **Responsible NEPA Official**

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Seattle, Washington 98174-1002

## **State Environmental Policy Act (SEPA) Lead Agency**

Sound Transit  
401 South Jackson Street  
Seattle, Washington 98104-2826

### **Responsible SEPA Official**

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Sound Transit  
401 South Jackson Street  
Seattle, Washington 98104-2826

## **Contacts for Additional Information**

### **Sound Transit**

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401 South Jackson Street  
Seattle, Washington 98104-2826

### **Federal Transit Administration**

Dan Drais, Environmental Protection Specialist  
915 Second Avenue, Suite 3142  
Seattle, Washington 98174-1002  
(206) 220-4465

## Anticipated Permits and Approvals

<b>Federal Agency</b>	<b>Permits/Approvals</b>
Federal Highway Administration (FHWA)	Interstate Air Space Leases Design Documentation Package Interchange Justification Reports Interstate Design Deviations Interstate Transportation System Interchange Access Modification Requests Limited Access Breaks Monitoring Well Agreements Operations and Maintenance Agreement Record of Decision or other National Environmental Policy Act environmental determination
Federal Transit Administration	National Environmental Policy Act Final Environmental Impact Statement and Record of Decision Section 106 (National Historic Preservation Act) Review; Section 4(f) Review
U.S. Army Corps of Engineers	Clean Water Act, Section 404 Wetlands Approval
U.S. Fish and Wildlife Service and National Oceanic Atmospheric Administration Fisheries	Federal Endangered Species Act Review
<b>State, County, and Regional Agency</b>	
Sound Transit	State Environmental Policy Act Final Environmental Impact Statement and Project Approval
Washington Department of Fish and Wildlife	Hydraulic Project Approval
Washington State Department of Archaeology and Historic Preservation	Section 106 (National Historic Preservation Act) Review
Washington State Department of Ecology	Coastal Zone Management Consistency Certification National Pollutant Discharge Elimination System Stormwater Discharge Permit, Clean Water Act Section 402 Underground Storage Tank (UST) 30-Day Notice Wastewater Discharge Permit Water Quality Certification: Clean Water Act Section 401
Washington State Department of Ecology and Puget Sound Clean Air Agency	Notice of Construction (Air Quality)
Washington State Department of Transportation	Air Space Lease: State Transportation Routes Air Space Lease: Interstate (with FHWA) Construction Oversight Agreement Design Documentation Package (with FHWA) General Permits Interchange Justification Report (with FHWA) Interstate Design Deviation (with FHWA) Interstate Transportation System Interchange Access Modification Request (with FHWA) Limited Access Breaks (with FHWA) Monitoring Well Agreements (with FHWA) Operations and Maintenance Agreement (with FHWA) Survey Permits
<b>Cities</b>	
Cities of Seattle, Shoreline, Mountlake Terrace, and Lynnwood	Administrative Conditional Use and/or Design Review Approvals Binding Lot Adjustments and Site Plan Approvals Building Permits: Mechanical, Plumbing, Electrical, Signs, Fences, and Awnings Comprehensive Plan or Development Code Amendments, Special Use Permits, and/or Zoning Revision Applications Construction Permits: Clearing and Grading, Demolition, Drainage, Driveways, Haul Routes, Landscape and Irrigation, Parking, Sanitary Sewers, Side Sewers, Street Use, Tree Protection, Use of City Right-of-Way, and Walls Conveyance (Elevators and/or Escalators) Environmental Critical Areas/Sensitive Areas Review including Wetlands, Streams, Rivers, Lakes, Steep Slopes, Flood Zones, Critical Habitat, and Buffers

	Fire Protection and Hydrant Use Permits
	Inspection Record Approval and Occupancy Permits
	Noise Variances
	Reviews and Approvals: Planning, Design, and Arts Commissions;
	Right-of-Way Permit or Franchise (Utilities)
	Shoreline Substantial Development Permit (if required)
	Street and Alley Vacations
	Permanent, Interim, or Temporary Street Use Permits
	Access or Use Easements for City-owned Properties
	Removal/Abandonment of Residential USTs or Underground
	Heating Oil Tanks
	Traffic, Transportation, and Parking Approvals
	Use of City Right-of-Way (for construction)
	Water Meter and Water Main Permits and Approvals
City of Lynnwood	Floodplain Development License
City of Seattle	Greenfactor and Greenhouse Gas Emissions Calculations
	Master Use Permit
	Seattle Landmark Preservation Board—Landmark Eligibility Review
City of Shoreline	Master Development Plan Approval
<b>Other</b>	
Utility Providers	Pipeline and Utility Crossing: Permits
	Utility Approvals: Easements and Use Agreements

## Principal Contributors

Appendix E, List of Preparers, identifies the principal contributors. North Corridor Transit Partners (a joint venture of Parametrix, Inc. and Parsons Brinckerhoff) was the lead consultant in preparing this Final EIS.

## Date of Issue of Final Environmental Impact Statement under SEPA

April 1, 2015

## Date of Issue of Final Environmental Impact Statement under NEPA

April 3, 2015

## Next Actions

Following publication of this Final EIS, the Sound Transit Board of Directors will make a final decision on the route and station locations to be built for the project. The Federal Transit Administration also is expected to issue its Record of Decision (ROD) on the project.

## Related Documents

- North Corridor Transit Project Alternatives Analysis Report and SEPA Addendum (Sound Transit, September 2011)
- Transportation 2040: Metropolitan Transportation Plan for the Central Puget Sound Region, 2014 Update (Puget Sound Regional Council, March 2010, amended May 2014)

- North Link SEPA Addendum to the Final Supplemental EIS (Sound Transit, March 2012)
- North Link Final Supplemental EIS (Sound Transit, April 2006)
- Sound Transit 2: A Mass Transit Guide, The Regional Transit System Plan for Central Puget Sound (Sound Transit, July 2008)
- Regional Transit Long-Range Plan and Final Supplemental EIS (Sound Transit, July 2005)
- Lynnwood Link Extension Draft EIS (Sound Transit, July 2013)
- Regional Transit Long-Range Plan Update and Supplemental Draft and Final EIS (Sound Transit, 2014)
- Link Operations and Maintenance Satellite Facility, Draft EIS (Sound Transit, 2014)

All the above Sound Transit and PSRC documents are available on each agency's respective Web site. The Table of Contents provides a list of other relevant documents that are included with this Final EIS.

### **Cost of Document and Availability for Review and/or Purchase**

This Final EIS is available to the public in a variety of formats and locations. It is available on the Sound Transit Web site ([www.soundtransit.org/lle](http://www.soundtransit.org/lle)) and on compact disk (CD) at no cost. The CD includes all Final EIS appendices and technical reports. Paper copies are available for the cost listed below, which does not exceed the cost of reproduction:

- Summary – FREE
- Final EIS – \$25.00
- Technical Reports – \$15.00 each

Paper copies of these documents are available for review or purchase at the offices of Sound Transit, Union Station, 401 South Jackson Street, Seattle, Washington 98104. To request any of the documents, please contact Lauren Swift at (206) 398-5301. To review them, please call the Sound Transit librarian at (206) 398-5344 weekdays from 8:00 am to 5:00 pm to arrange an appointment.

Paper and CD copies of the Final EIS documents are also available for review at the following public places:

Seattle Public Library branches

- Central Library: 1000 Fourth Avenue, Seattle
- Northgate Branch: 10548 Fifth Avenue NE, Seattle

King County Library System

- Shoreline Library: 345 NE 175th Street, Shoreline

#### Sno-Isle Libraries

- Edmonds Library: 650 Main Street, Edmonds
- Mountlake Terrace Library: 23300 58th Avenue West, Mountlake Terrace
- Lynnwood Library: 19200 44th Avenue West, Lynnwood

#### University of Washington Libraries

Washington State Library: Point Plaza East, 6880 Capitol Boulevard SE, Tumwater

### **Appeals**

Washington State Environmental Policy Act (SEPA) challenges to this Final EIS are governed by Sound Transit Resolution R7-1 and the SEPA rules and regulations (Ch. 43.21C RCW and WAC 197-11-680). Sound Transit Resolution R7-1 is available online at: <http://www.soundtransit.org/About-Sound-Transit/Board-of-Directors/Board-archives/Resolutions-archive.xml> (1994-1997 Resolutions).

As provided in Resolution R7-1, appeals of SEPA determinations must be made in writing by filing a letter of appeal and paying the required fee within 14 days following the date the environmental document is issued under SEPA. Letters of appeal should be addressed to Joni Earl, Chief Executive Officer, Sound Transit, Union Station, 401 South Jackson Street, Seattle, Washington 98104-2826.

For this Final EIS, appeals must be received by Sound Transit on or before 5:00 p.m. on April 15, 2015. Additional details about the appeals process and requirements are set out in Resolution R7-1 and in the SEPA rules and regulations.

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## **Technical Reports\***

**Cultural, Archaeological, and Historic Resources**

**Ecosystem Resources**

**Noise and Vibration**

**Transportation**

\* Provided on CD with the Final EIS and available on the project website at [www.soundtransit.org/llc](http://www.soundtransit.org/llc). Printed versions are available on request for the cost of reproduction.



## ACRONYMS AND ABBREVIATIONS

ADA	Americans with Disabilities Act
APE	Area of Potential Effects
BMP	best management practice
BTEX	benzene, toluene, ethylbenzene, and xylenes
Btu	British thermal unit
CAA	Clean Air Act
CALs	collision analysis locations
Caltrans	California Department of Transportation
CCTV	closed circuit television
CFR	Code of Federal Regulations
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
CO <sub>2e</sub>	carbon dioxide equivalent
DAHP	Washington State Department of Archaeology and Historic Preservation
dB	decibel
dBA	A-weighted decibel
dbh	diameter at breast height
Ecology	Washington State Department of Ecology
EDR ID	Environmental Data Resources identification number
EIS	environmental impact statement
EMF	electromagnetic field
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
EVP	Emergency Vehicle Preemption
FGTS	Freight and Goods Transportation System
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GHG	greenhouse gas
GIS	geographic information system

GMA	Growth Management Act
HOV	high-occupancy vehicle
HPA	Hydraulic Project Approval
HSS	Highways of Statewide Significance
Hz	Hertz
I-5	Interstate 5
kV	kilovolt
Ldn	day-night sound level
Leq	equivalent sound level
LID	low impact development
Lmax	maximum sound level
LOS	level of service
LUST	leaking underground storage tank
LWCF	Land and Water Conservation Fund
MAP-21	Moving Ahead for Progress in the 21st Century
MOA	Memorandum of Agreement
MOVES	Motor Vehicle Emission Simulator
MP	milepost
mph	miles per hour
MSAT	mobile source air toxic (pollutants)
MTP	Metropolitan Transportation Plan
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOAA Fisheries	National Oceanic and Atmospheric Administration Fisheries
NO <sub>2</sub>	nitrogen dioxide
NO <sub>x</sub>	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPGIS	non-pollution-generating impervious surface
NRHP	National Register of Historic Places

O <sub>3</sub>	ozone
OMF	Operations and Maintenance Facility
OMSF	Operations and Maintenance Satellite Facility
Pb	lead
PCB	polychlorinated biphenyl
PGIS	pollution-generating impervious surface
PM	particulate matter
PM <sub>10</sub>	particulate matter (10 microns or less in size)
PM <sub>2.5</sub>	particulate matter (2.5 microns or less in size)
POM	polycyclic organic matter
ppm	parts per million
PSCAA	Puget Sound Clean Air Agency
PSE	Puget Sound Energy
PSRC	Puget Sound Regional Council
PUD	Public Utility District
RCW	Revised Code of Washington
ROD	Record of Decision
RTIP	regional transportation improvement plan
RTP	regional transportation plan
SCL	Seattle City Light
Sea-Tac Airport	Seattle-Tacoma International Airport
SEPA	State Environmental Policy Act
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO <sub>2</sub>	sulfur dioxide
Sound Transit	Central Puget Sound Regional Transit Authority
SR	State Route
ST2	Sound Transit 2
SWPPP	stormwater pollution prevention plan
TCP	traditional cultural property

TESC	temporary erosion and sediment control
TSP	total suspended particulates
USC	United States Code
USDOT	U.S. Department of Transportation
UST	underground storage tank
v/c ratio	volume-to-capacity ratio
VdB	vibration decibels
VHT	vehicle hours of travel
VMT	vehicle miles of travel
VOC	volatile organic compound
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation



# SUMMARY

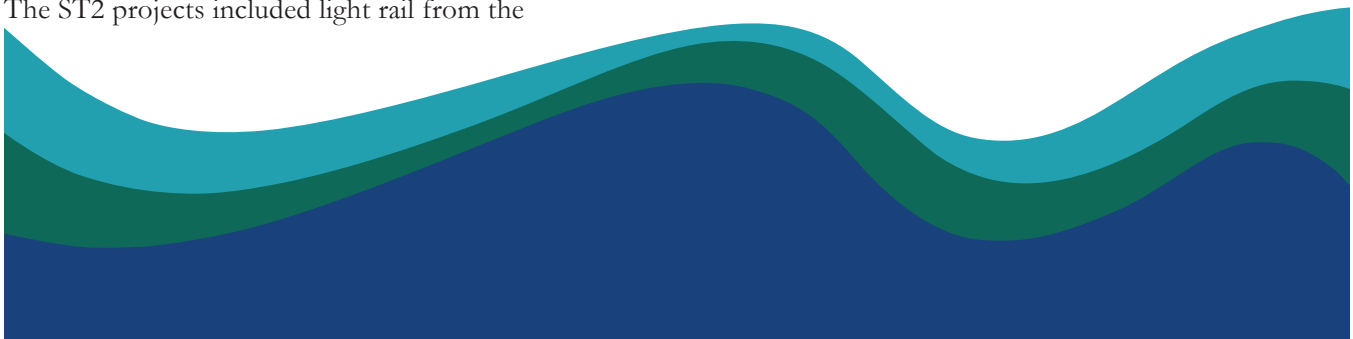
## S.1 LYNNWOOD LINK EXTENSION

The Central Puget Sound Regional Transit Authority (Sound Transit) is proposing to build and operate the Lynnwood Link Extension, which would expand the regional light rail system from Seattle north to Lynnwood in Washington State. The proposed project would be in the cities of Seattle and Shoreline in King County and in Mountlake Terrace and Lynnwood in Snohomish County.

The Lynnwood Link Extension is a step in implementing the Puget Sound Regional Council's (PSRC) VISION 2040 (PSRC 2009) and the Sound Transit Regional Transit Long-Range Plan (Sound Transit Long-Range Plan) (Sound Transit 2005a, updated 2014), both of which call for the eventual extension of mass transit service beyond Lynnwood to Everett. The project would implement the Sound Transit 2 (ST2) Plan of regional transit investments. The ST2 projects included light rail from the

Northgate Transit Center to the Lynnwood Transit Center, with intermediate stations serving north Seattle, Shoreline, and Mountlake Terrace.

Sound Transit and the Federal Transit Administration (FTA) have prepared this Final Environmental Impact Statement (EIS) in compliance with the National Environmental Policy Act (NEPA) and the Washington State Environmental Policy Act (SEPA). FTA is the federal lead agency under NEPA, and Sound Transit is the state lead agency under SEPA. The Draft EIS was released in July 2013, followed by a 60-day public comment period. After considering the Draft EIS, along with public and agency comments, the Sound Transit Board of Directors identified a Preferred Alternative. The Final EIS describes the Preferred Alternative for the proposed project, updates the analysis of environmental impacts for the Preferred Alternative and all other alternatives, describes proposed mitigation measures, and responds to comments Sound Transit and FTA received on the Draft EIS.



### S.1.1 Project Area

The proposed Lynnwood Link Extension would begin at Northgate in north Seattle and end at the Lynnwood Transit Center (Figure S-1). The project would be about 8.5 miles long, generally following Interstate 5 (I-5), the major north-south route through the state. This corridor is in one of the most densely developed urban areas in the Pacific Northwest and is part of a longer north-south commuter corridor connecting Tacoma, Seattle, and Everett. Roadways in this corridor are heavily congested during peak travel periods. Congestion is expected to worsen as the region accommodates 20 percent more people and nearly 40 percent more jobs through 2040.

The Lynnwood Link Extension would connect to Central Link, the spine of the regional light rail system. The initial sections of Central Link are already operating between downtown Seattle and Seattle-Tacoma International Airport. Light rail sections from downtown Seattle to the north are under construction. Sound Transit expects University Link from downtown Seattle to the University of Washington to open in 2016 and the extension to Northgate in 2021. Overall, the projects in the ST2 program include nearly 36 new miles of service to the north, south, and east, resulting in 55 miles of light rail.

## S.2 PURPOSE AND NEED FOR THE LYNNWOOD LINK EXTENSION

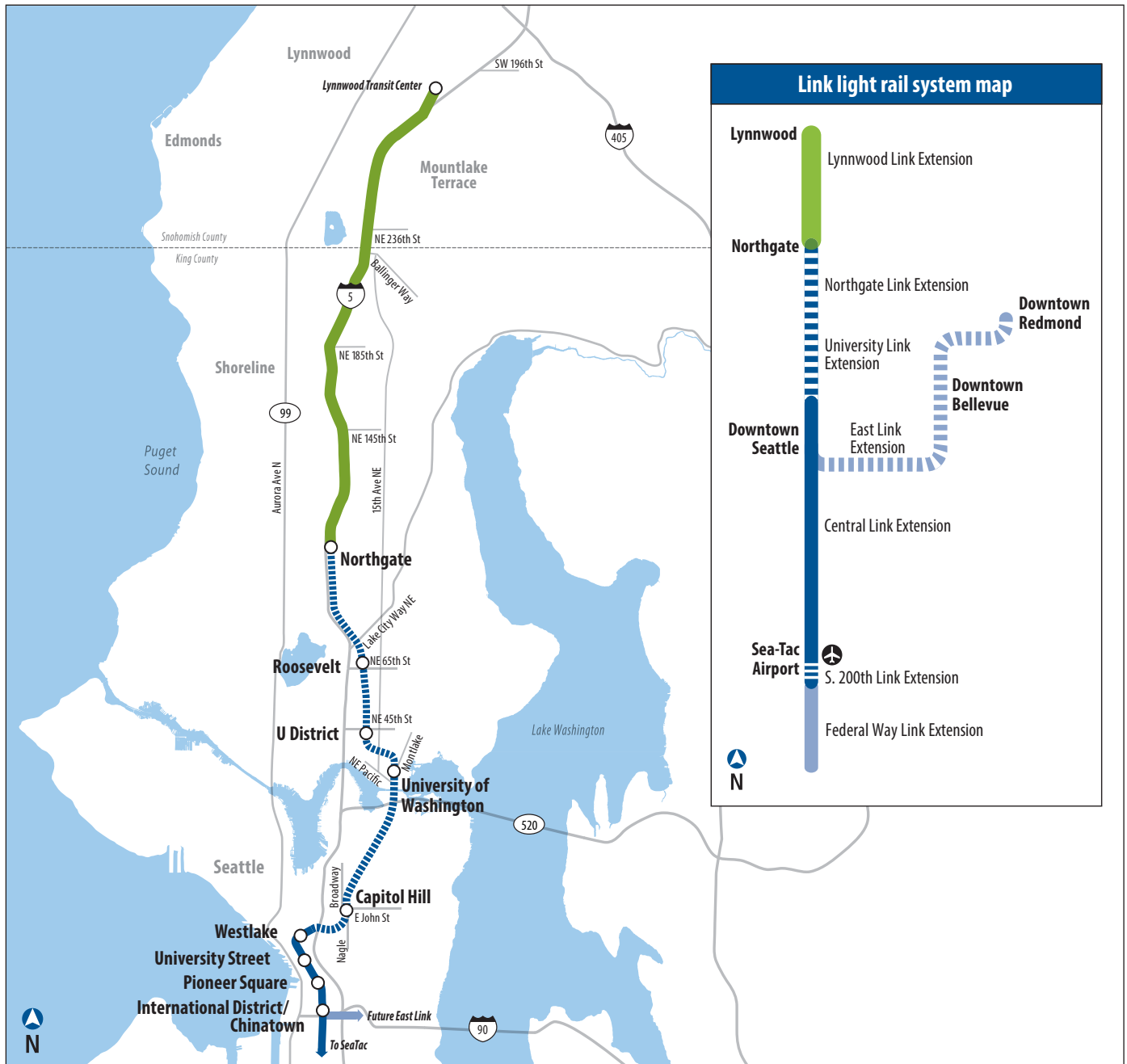
The purpose of the Lynnwood Link Extension is to expand the Sound Transit Link light rail system from Northgate in Seattle north into Shoreline, Mountlake Terrace, and Lynnwood in Snohomish County in order to:

- 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 regional multimodal transportation connections.
- 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.

The project is needed to:

- Address increasingly unreliable travel times for transit trips that now rely on the corridor's highly congested roadways.
- 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.



DATA SOURCES: (Sound Transit)

## Legend

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

**Figure S-1. Regional Setting**

- Advance the long-range vision of 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 decrease harmful greenhouse gas emissions in the atmosphere.

## S.3 ALTERNATIVES

This section describes the alternatives evaluated in the Lynnwood Link Extension Final EIS. The alternatives are a No Build Alternative, the Preferred Alternative, and several other light rail alternatives, presented by project segment.

### S.3.1 No Build Alternative

The No Build Alternative represents the anticipated transportation system without the Lynnwood Link Extension. It includes other committed transportation projects identified in the Metropolitan Transportation Plan adopted by PSRC in 2010 (Transportation 2040). It also assumes growth in regional population and employment through 2035. Under the No Build Alternative, Sound Transit would still build and operate the Northgate Link Extension, East Link Extension to Overlake in Redmond, South 200th

Link Extension, Federal Way Link Extension to approximately Highline Community College, and the Link Operations and Maintenance Satellite Facility (OMSF), as authorized in the ST2 program.

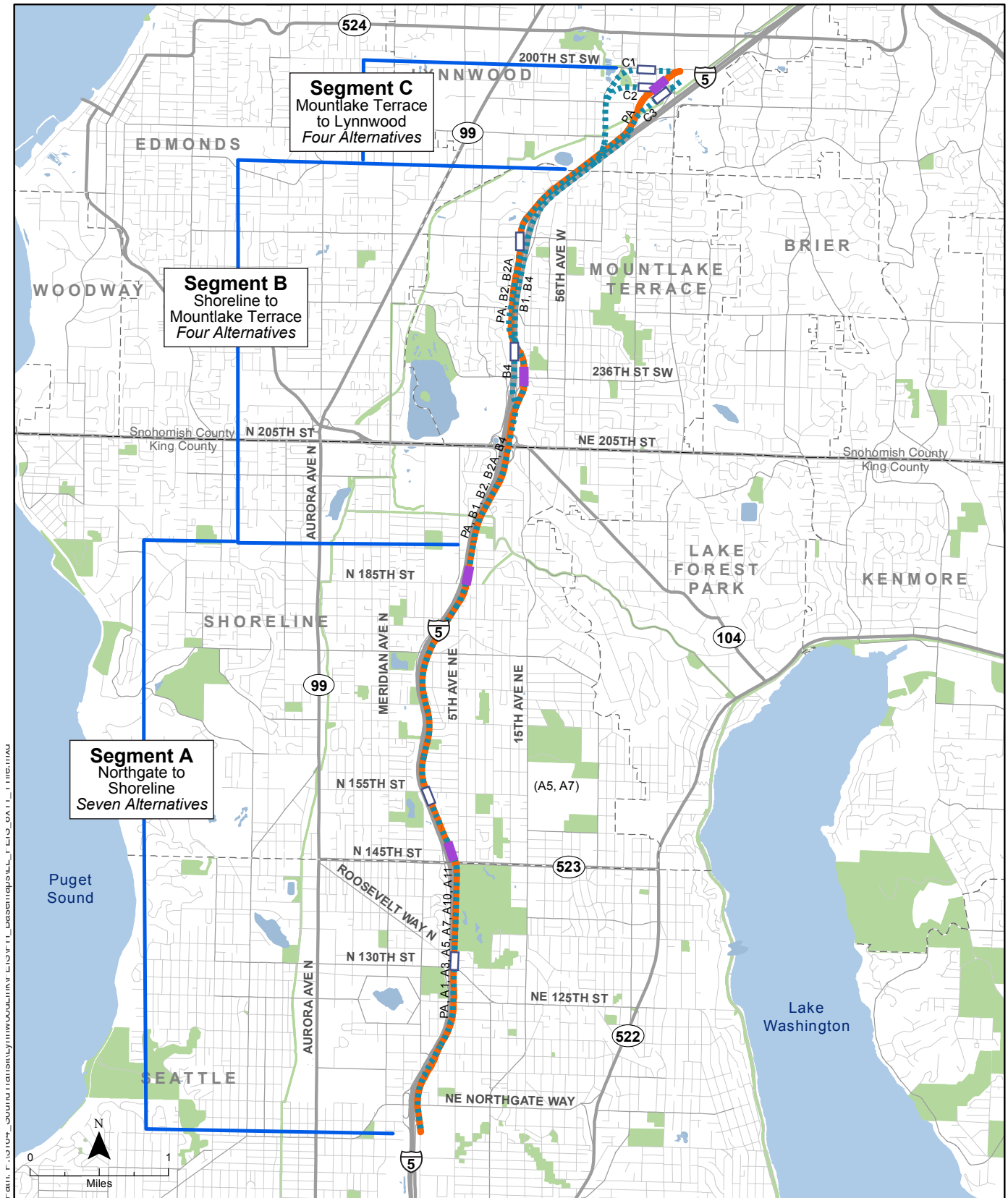
### S.3.2 Light Rail Alternatives

The light rail alternatives are grouped in three geographic segments—A, B, and C—as shown in Figure S-2, which also highlights the Preferred Alternative. The alternatives generally follow the I-5 corridor from the Northgate Transit Center in Seattle to the Lynnwood Transit Center. Figures S-3 through S-10, included later in this section, depict the alignments and stations for each segment.

The Preferred Alternative identified by the Sound Transit Board in November 2013 has a mix of at-grade and elevated sections that run along the east side of I-5 from the Northgate Transit Center to the Mountlake Terrace Transit Center. It then crosses to the west side of I-5, where it runs at-grade until 220th Street SW in Mountlake Terrace. It is then elevated along the west side of I-5 until it approaches the Lynnwood Transit Center and park-and-ride, where it angles northeast to a station adjacent to the Lynnwood Transit Center. The four stations for the Preferred Alternative would be at NE 145th Street, NE 185th Street, the Mountlake Terrace Transit Center, and the Lynnwood Transit Center. (The Final EIS also reviews options for additional stations at NE 130th Street and at 220th Street SW.) About 1,500 new park-and-ride spaces are planned, with about 500 spaces added at each of the stations except at the Mountlake Terrace Transit Center, which would maintain its current level of parking.



*I-5 north of Northgate in Seattle*



**Figure S-2. Alternatives by Segments**

Common features of the alternatives Sound Transit is evaluating are described below. Light rail trains would operate revenue service (carry passengers) weekdays between 5:00 am and 1:00 am daily, running as often as every 4 minutes each way during peak periods, and every 7.5 minutes in the early morning or late at night.

The alternatives present a variety of ways Sound Transit could approach the design, construction, and operation of the proposed project. They show how light rail could be developed mostly adjacent to I-5 and how the profile for light rail might vary based on existing conditions, such as bridges, interchanges, and other infrastructure and environmental or community features. They reflect how topography and various station choices affect alignment decisions, and they illustrate different ways light rail could cross I-5 to ultimately reach the project's terminus station in Lynnwood.

**At-grade or Elevated Profiles:** While all of the alternatives would have light rail in an exclusive right-of-way (separated from other traffic), some are mostly at-grade and others are mostly elevated. These choices are largely related to existing transit facilities, topography, right-of-way, and freeway features such as interchanges and bridges. At-grade alternatives can have the advantage of lower construction and operating costs compared with elevated alternatives, but they can require rebuilding bridges, ramps, or interchanges, which can increase costs and impacts. At-grade alternatives can also result in some property or environmental impacts



*At-grade Light Rail Train*



*Elevated Light Rail Train with Overhead Catenary Wires*

that could be reduced or avoided by an elevated alternative. However, elevated alternatives can cause more noise and visual impacts than at-grade alternatives.

**Number and Location of Stations:** The alternatives offer choices in station locations and profile (at-grade or elevated), and in parking and access. At-grade stations are generally less expensive to construct and operate, while elevated stations can have a smaller footprint and other elements beneath them.

**Parking Facilities:** The alternatives present several ways for the proposed project to address the need for parking. The approach varies by station location along the proposed project's length; at each station, the parking facilities and supply reflect factors such as expected demand, street and freeway access, urban settings, site constraints, and local plans. The project would increase corridor parking capacity by 1,500 to 1,900 spaces.

## SEGMENT A: SEATTLE TO SHORELINE

Segment A has seven alternatives connecting Northgate in Seattle to NE 185th Street in Shoreline, all on the east side of I-5. These alternatives differ from each other in three key ways: the extent to which they are at-grade or elevated, the number of

stations (two versus three), and the locations of stations. Some stations also feature park-and-rides with different parking options. Figures S-3 through S-6 show the alignments and stations for each of the Segment A alternatives.

Key Characteristics of the Segment A Alternatives							
	PA	A1	A3	A5	A7	A10	A11
<b>Profile</b>							
<b>Mostly At-grade</b>	•	•		•		•	
<b>Mostly Elevated</b>			•		•		•
<b>Stations*</b>							
<b>130th</b>				G	E	G	E
<b>145th</b>	E	E	E			E	E
<b>155th</b>				E	E		
<b>185th</b>	G	G	E	G	E	G	E
*E = Elevated; G = At-grade							

**Preferred Alternative (At-grade/Elevated with NE 145th and NE 185th Stations).** The Preferred Alternative (Figure S-3) combines at-grade and elevated sections, with stations at NE 145th Street and NE 185th Street. It is based largely on Alternative A1 from the Draft EIS, but incorporates several of the more effective design approaches explored in other Draft EIS alternatives. It is elevated from the Northgate Station to about NE 115th Street, and then stays mostly at-grade except for sections between NE 130th Street through NE 145th Street, and at NE 155th Street and NE 175th Street. The design also includes measures to maintain access for the Seattle Latvian Evangelical Lutheran Church. (Access to the church has been maintained in revisions to other alternatives as well.) Other key elements include a shift east around the NE 117th Street bridge at I-5; reconstruction of the NE 130th Street interchange, overpass, and 5th Avenue NE; a revised ramp at the NE 145th Street interchange; realignments for sections of 1st Avenue NE in Seattle and Shoreline; realignments of sections of 5th Avenue NE and 7th Avenue NE in Shoreline, and modification of the NE 185th Street overpass. The Preferred Alternative in Segment A also relocates existing traffic noise walls, generally

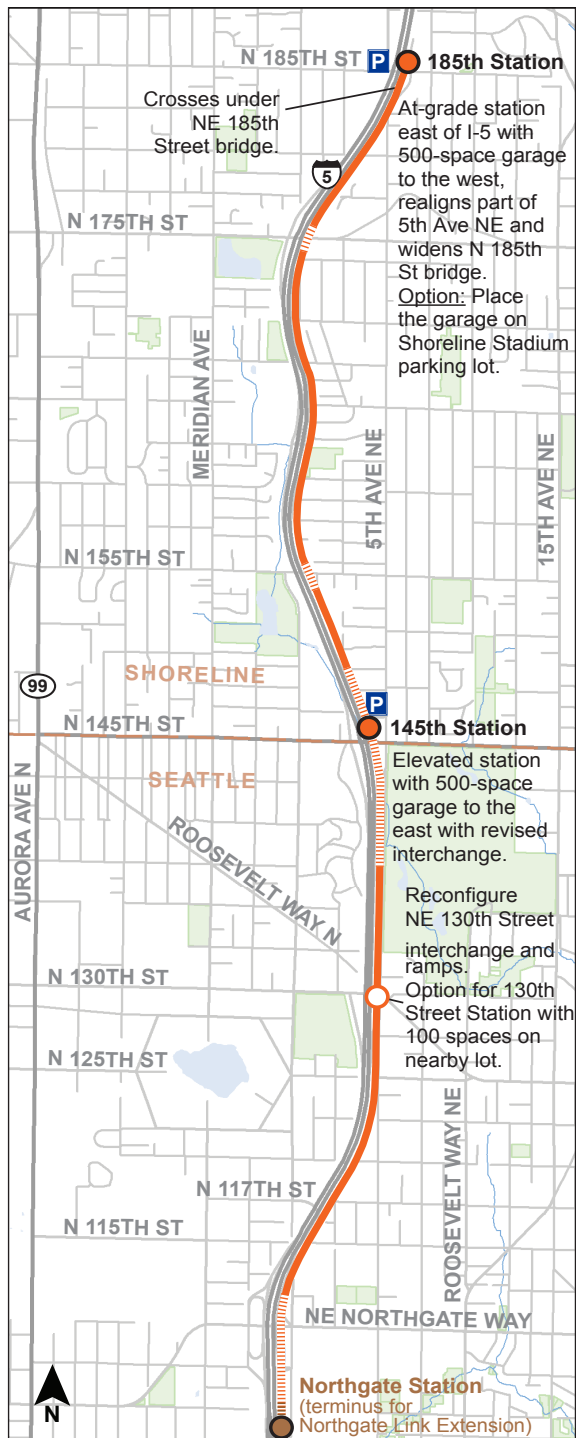
to the east of the light rail guideway. The Final EIS also evaluates two options: a station at 130th Street NE, and a parking garage for the NE 185th Street Station on a parking lot at Shoreline Stadium.

**Alternative A1: At-grade/Elevated with NE 145th and NE 185th Stations.** Alternative A1 (Figure S-3) connects to the light rail guideway of the Northgate Link Extension near NE 104th Street. It is elevated from Northgate until about NE 115th Street, and then stays mostly at-grade except for sections between NE 130th Street and NE 145th Street, and at NE 155th Street and NE 175th Street. In addition to the stations shown on Figure S-3, key features include a replaced NE 117th Street bridge over I-5; a reconfigured NE 130th Street interchange; realignments for parts of 1st Avenue NE, 5th Avenue NE, and 7th Avenue NE in Shoreline; and a replaced NE 185th Street bridge over I-5.

**Alternative A3: Mostly Elevated with NE 145th and NE 185th Stations.** Alternative A3 is similar to Alternative A1, but the alignment is mostly elevated, except from about NE 150th Street to about NE 173rd Street. This alternative features different station configurations at its NE 145th Street and NE 185th Street Stations (see Figure S-4). It avoids the NE 117th Street bridge by crossing over the road and to the east, and it modifies the ramps at the NE 145th Street interchange.

**Alternative A5: At-grade/Elevated with NE 130th, NE 155th, and NE 185th Stations.** Alternative A5 is largely based on Alternative A1, except that it has stations at NE 130th and NE 155th Streets (instead of a station at NE 145th Street), and with a different option for a NE 185th Street Station (see Figure S-4). Other key elements include a shift east around the NE 117th Street bridge at I-5, changes at the NE 130th Street interchange, and realignments for parts of 1st Avenue NE and 7th Avenue NE in Shoreline.

**Alternative A7: Mostly Elevated with NE 130th, NE 155th, and NE 185th Stations.** Alternative A7 combines station choices similar to Alternative



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

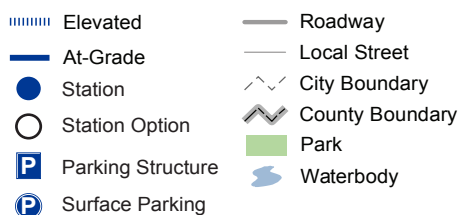
**Figure S-3. Preferred Alternative and Alternative A1**



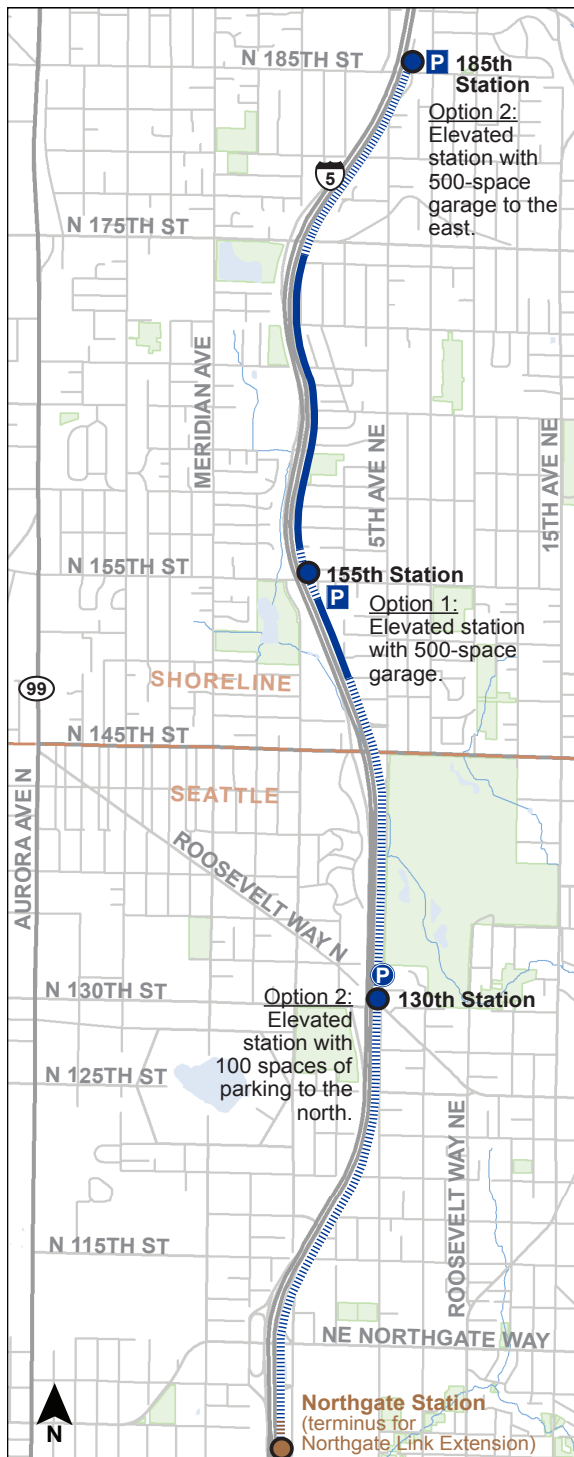
**A3: MOSTLY ELEVATED WITH NE 145th AND NE 185th STATIONS**



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



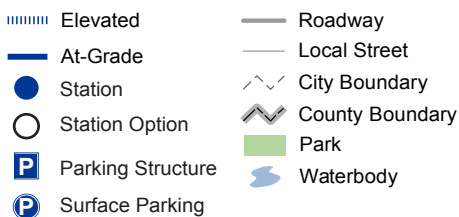
**Figure S-4. Alternatives A3 and A5**



**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**



**Figure S-5. Alternatives A7 and A10**

A5, with Alternative A3's elevated sections over the NE 117th Street overpass and the NE 130th Street off-ramp and bridge (see Figure S-5).

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

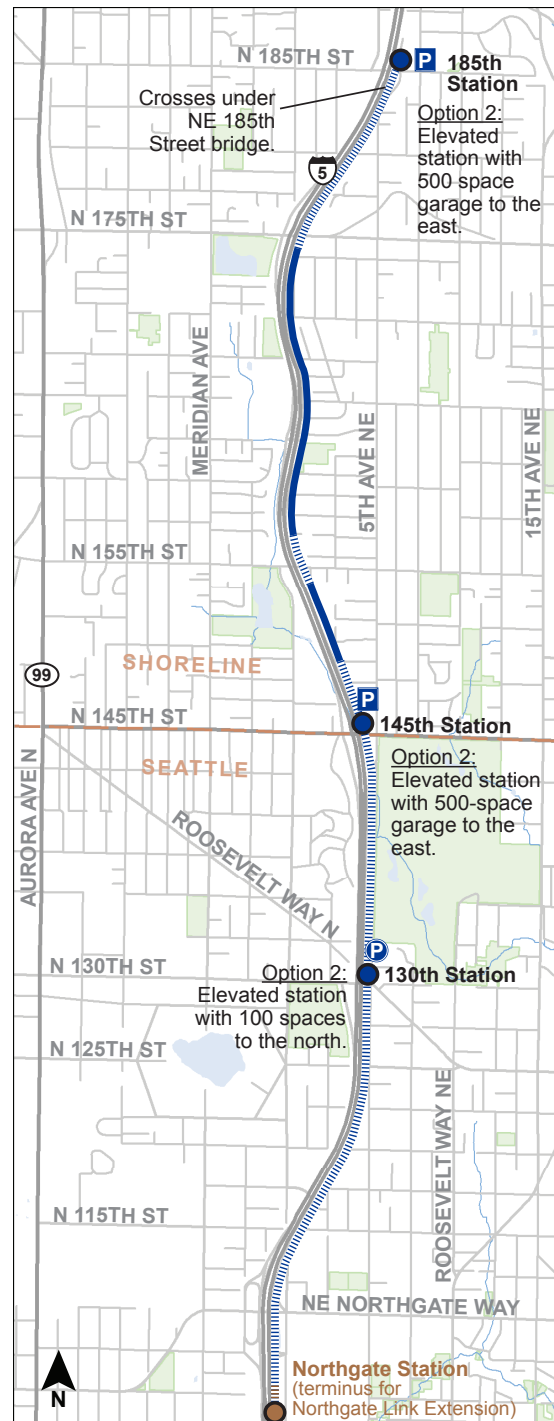
Alternative A10 is based on Alternative A1 but with three stations, and different station configurations and parking options, as shown on Figure S-5.

**Alternative A11: Mostly Elevated with NE 130th, NE 145th, and NE 185th Stations.** Alternative A11 is based on Alternative A3 but adds the NE 130th Street Station (see Figure S-6).

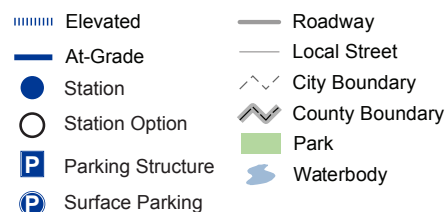
## SEGMENT B: SHORELINE TO MOUNTLAKE TERRACE

Four alternatives are proposed for Segment B from NE 185th Street in Shoreline to 212th Street SW in Mountlake Terrace. All alternatives begin on the east side of I-5 and end either in the I-5 median or on the west side of I-5. These alternatives have at-grade and elevated sections along their alignment, but all are elevated as they enter Mountlake Terrace. After that, the median alignments are generally at-grade while the west side alignments are both at-grade and elevated. Three of the alternatives feature a station at the existing Mountlake Terrace Transit Center and park-and-ride (NE 236th Street), while one places a station at the Mountlake Terrace Freeway Station in the I-5 median. One alternative also features an additional station at 220th Street SW. Figures S-7 and S-8 show the Segment B alternatives.

**Preferred Alternative: East Side to Mountlake Terrace Transit Center to West Side.** The Preferred Alternative begins north of the NE 185th Street Station and proceeds in a retained cut along the east side of I-5 (see Figure S-7). It crosses below a replaced NE 195th Street pedestrian bridge and then becomes elevated as it enters the valley that includes the SR 104/NE 205th Street/Ballinger Way interchange, and it continues elevated to a station on the east side of the Mountlake Terrace Transit Center. North of the station, it crosses over all I-5 lanes to the west side of I-5 (refining Alternative B2 in the Draft EIS), where it continues north until it



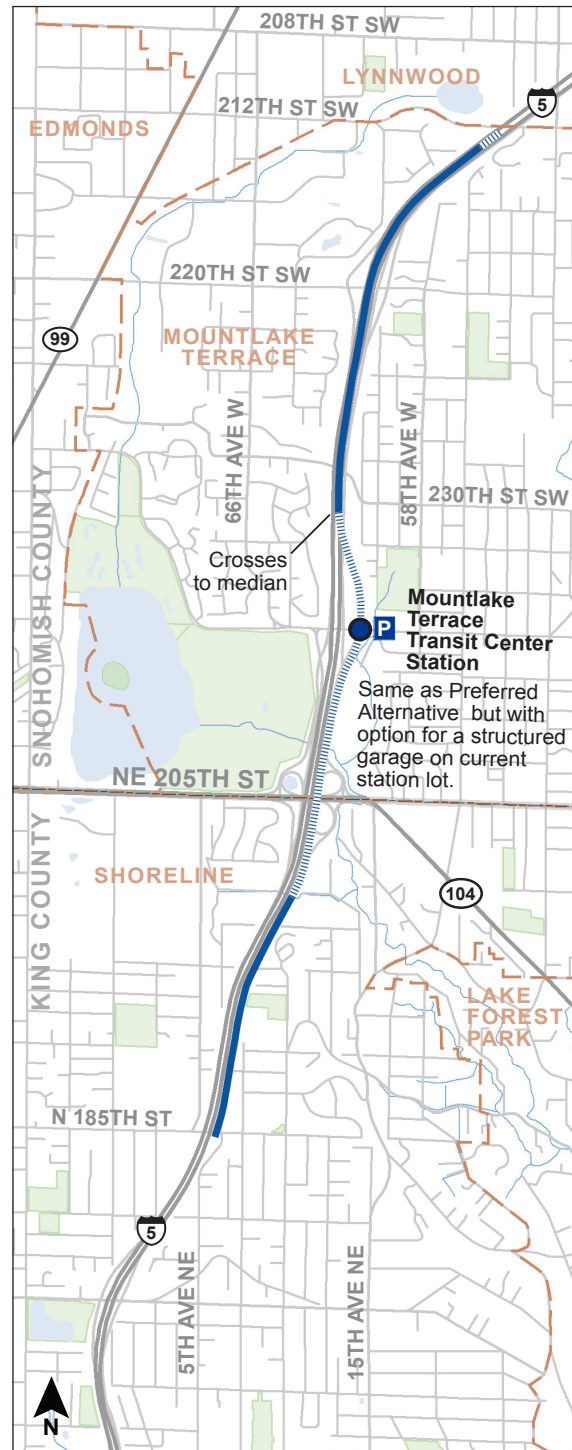
**A11: MOSTLY ELEVATED WITH NE 130th, NE 145th AND NE 185th STATIONS**



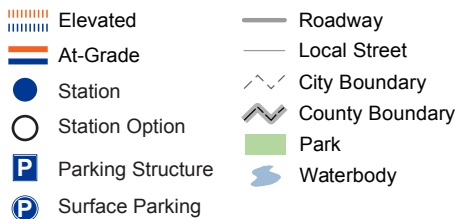
**Figure S-6. Alternative A11**



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



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



**Figure S-7. Preferred Alternative and Alternative B1**

crosses over 220th Street SW and the I-5 freeway ramps, which would be modified. It then descends to follow the east side of 60th Avenue West, and runs mostly on retained cut and fill structures along the west side of I-5 before finishing with an elevated guideway over 212th Street SW. The Preferred Alternative has an optional elevated station with a 200-space park-and-ride south of 220th Street SW. This would shift the alignment slightly west and avoid modifying the I-5 on-ramps and off-ramps at 220th Street SW.

Key Characteristics of the Segment B Alternatives				
	PA	B1	B2A	B4
<b>Mountlake Terrace Station</b>				
<b>Transit Center</b>	•	•	•	
<b>Freeway Station</b>				•
<b>Alignment North of Mountlake Terrace Station</b>				
<b>Freeway Median</b>		•		•
<b>West side</b>	•		•	
<b>Additional Station at 220th Street SW</b>			•	

**Alternative B1: East Side to Mountlake Terrace Transit Center to Median.** Alternative B1 begins north of the NE 185th Street Station and would be either in a retained cut or elevated guideway along the east side of I-5, depending on its Segment A connection (see Figure S-7). It crosses below a replaced NE 195th Street pedestrian bridge and then is largely elevated to a station on the east side of the Mountlake Terrace Transit Center. It then crosses over the northbound lanes of I-5, enters the freeway median, and drops to at-grade. The alignment continues at-grade in the median of I-5, generally at the level of the southbound I-5 lanes, north to approximately 212th Street SW.



Mountlake Terrace Transit Center

**Alternative B2A: East Side to Mountlake Terrace Transit Center to West Side with 220th Street SW Station.** Alternative B2A is similar to the Preferred Alternative, except it includes a station with a park-and-ride at 220th Street SW, as shown on Figure S-8. This configuration also would require modifying the on-ramps and off-ramps for I-5. The initial section of Alternative B2A from Segment A could also be either elevated or at-grade..

**Alternative B4: East Side to Mountlake Terrace Freeway Station to Median.** Alternative B4 (see Figure S-8) is the same as Alternative B1 from the NE 185th Street Station to about the Lake Ballinger Way/SR 104 interchange, where it crosses over to the I-5 median and under the 236th Street SW overpass to reach the Mountlake Terrace Freeway Station. North of the Mountlake Terrace Freeway Station, the Alternative B4 alignment is similar to Alternative B1.

## SEGMENT C: MOUNTLAKE TERRACE TO LYNNWOOD

In Segment C, all alternatives depart from I-5 but use different alignments to reach the Lynnwood Transit Center, with different stations and park-and-ride options at the project's north terminus. Figures S-9 and S-10 show the Segment C alternatives, which are all elevated.

Key Characteristics of the Segment C Alternatives				
	PA	C1	C2	C3
<b>Station Location</b>				
200th Street SW		•		
Lynnwood Transit Center	•		•	
Lynnwood Park-and-Ride				•



Lynnwood Transit Center

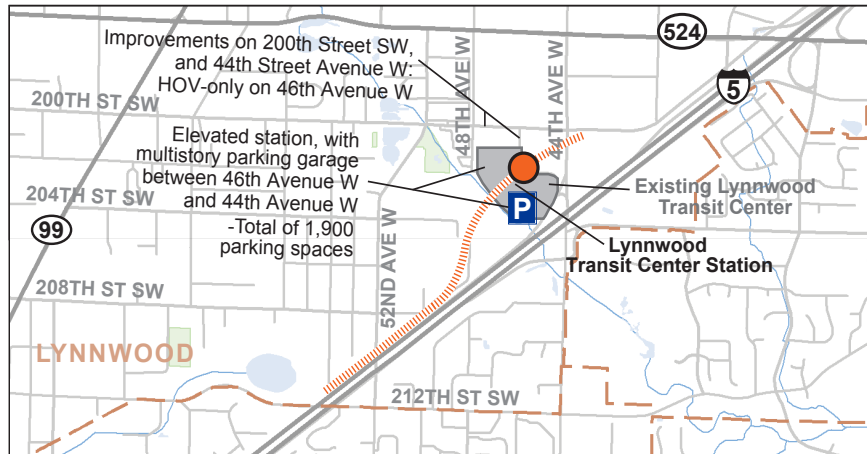


**B2A: EAST SIDE TO MOUNTLAKE TERRACE  
TRANSIT CENTER TO WEST SIDE  
WITH 220TH STATION NORTH OPTION**

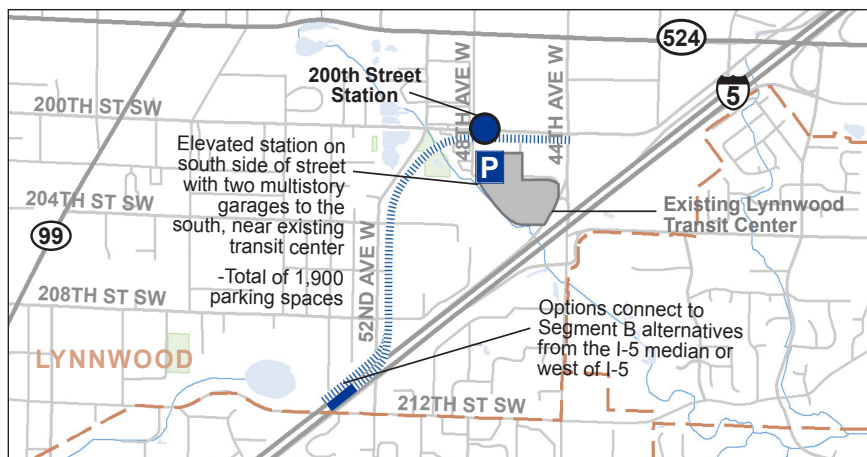


**B4: EAST SIDE TO MOUNTLAKE TERRACE  
FWY STATION TO MEDIAN**

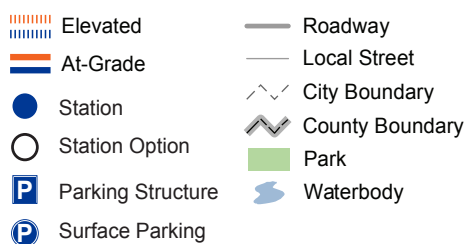
**Figure S-8. Alternatives B2A and B4**



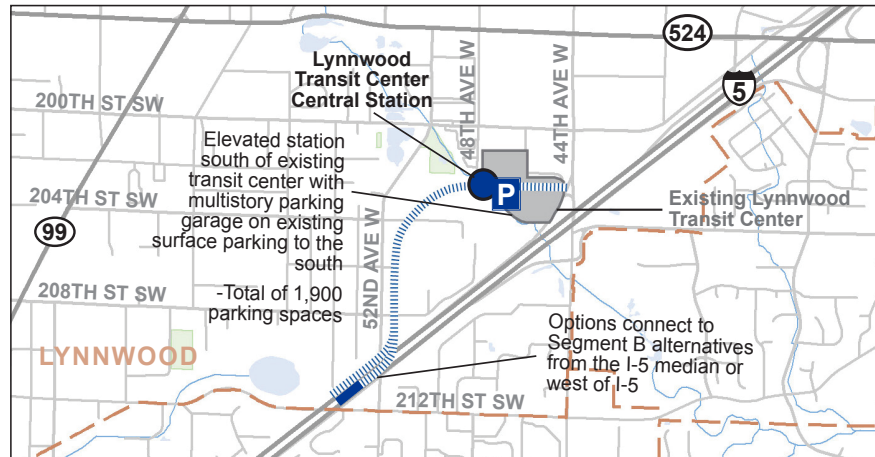
**PREFERRED ALTERNATIVE SEGMENT C:  
WEST SIDE TO LYNNWOOD TRANSIT CENTER STATION**



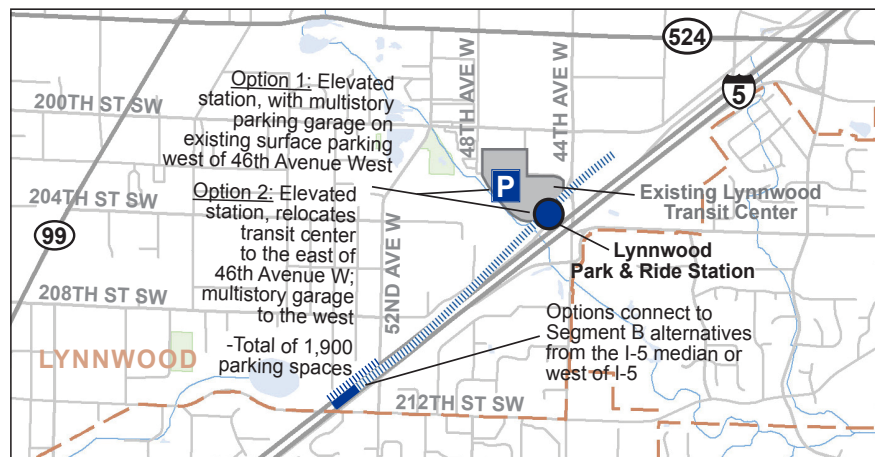
**C1: 52ND AVE WEST TO 200TH STREET STATION**



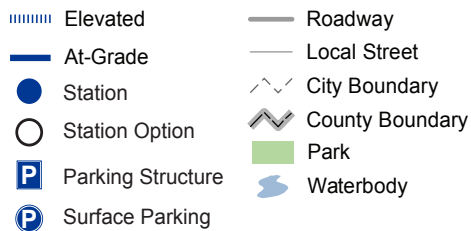
**Figure S-9. Preferred Alternative and Alternative C1**



**C2: 52ND AVE WEST TO LYNNWOOD TRANSIT CENTER STATION**



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



**Figure S-10. Alternatives C2 and C3**

**Preferred Alternative: West Side to Lynnwood Transit Center Station.** The Preferred Alternative is based on Alternative C3 with route and station modifications suggested by the City of Lynnwood and others during the Draft EIS comment period. From the end of Segment B at about 212th Street SW, the Preferred Alternative (see Figure S-9) continues elevated along the west side of I-5 until it passes over 52nd Avenue West. It leaves the side of I-5 and heads northeast at about 208th Street SW, crossing over the Interurban Trail right-of-way and Scriber Creek to reach a station straddling 48th Avenue West on the east side of the Lynnwood Transit Center. Past the station, tail tracks would extend over 44th Avenue West to the south side of 200th Street SW. Several streets serving the transit center would also be improved. The Preferred Alternative also has an option to develop a second garage with an additional 400 net spaces.

**Alternative C1: 52nd Avenue West to 200th Street SW Station.** Alternative C1 (see Figure S-9) begins with two alignment options to connect with Segment B alternatives. Option 1 transitions from at-grade in the I-5 median (connecting to Alternative B1 or B4), and Option 2 continues elevated on the west side of I-5 (when connecting to the Preferred Alternative or Alternative B2A). Both are elevated along the east side of 52nd Avenue West and Cedar Valley Road. Alternative C1 turns east over the corner of Scriber Creek Park and runs along the south side of 200th Street SW to its elevated 200th Street SW Station, with tail tracks near 48th Avenue West.

**Alternative C2: 52nd Avenue West to Lynnwood Transit Center Station.** Alternative C2 and its options from I-5 are the same as Alternative C1 to 52nd Avenue West, but it turns northeast to cross south of Scriber Creek Park to a station south of the existing Lynnwood Transit Center (see Figure S-10). Tail tracks would extend beyond the station.

**Alternative C3: Along I-5 to Lynnwood Park-and-Ride Station.** Alternative C3 also features two options for connections to Segment

B alternatives. At 208th Street SW, it crosses the Interurban Trail right-of-way and parallels I-5 to the Lynnwood Park-and-Ride Station south of 48th Avenue SW, east of the Lynnwood direct access ramp. Tail tracks would extend across 44th Avenue West. As shown in Figure S-10, the Lynnwood Station has two design options: one leaves the existing transit center as it is, and the other moves it next to the light rail station.

### S.3.3 Construction

Sound Transit plans to start construction in 2018 and open the line for service by 2023. The light rail project would be built in sections, with major construction activities typically lasting approximately 2 years in any given area, although more complex elements such as stations, major structures, and systems would take longer. In addition to the right-of-way needed to build the alignments and stations, Sound Transit would also need areas to stage construction activities. Where possible, Sound Transit would locate construction staging areas on available right-of-way or on properties it would need to acquire for permanent facilities; however, other sites along the corridor would also be needed.

Elevated guideways, station areas, and retaining wall construction usually have the most intense construction activities because they are more complex and need greater volumes of materials, equipment, and workers. Some streets would be partially or fully closed to through traffic, but local access would be maintained. Short-term I-5 lane closures would be needed for bridging structures across I-5 or to set up barriers bordering construction areas. Trucks and heavy equipment would be used throughout much of the construction period. See Construction Impacts in Section S.5.1 below for more details about construction activities. Appendix F, Conceptual Plans, shows anticipated construction staging areas

## S.4 ALTERNATIVES DEVELOPMENT

Sound Transit has built on several decades of previous planning and environmental review to define the alternatives described above. A light rail

connection between King County and Snohomish County was part of the 1996 Regional Transit System Plan and EIS (Sound Transit 1996), which resulted in Sound Transit's first system plan, the Sound Move program. The Sound Transit Long-Range Plan (adopted July 7, 2005) and its Final Supplemental EIS on the Long-Range Plan (June 2005) formed the basis for the ST2 Plan. The ST2 Plan identified the project that is now the Lynnwood Link Extension (Sound Transit 2005a, 2005b, 2008).

In 2010, Sound Transit conducted early scoping and an Alternatives Analysis that considered a broad range of alternatives for the project, including light rail and bus rapid transit alignments along I-5, SR 99, and other arterials in the project area. The September 2011 Alternatives Analysis Report and SEPA Addendum identified the most promising alternatives for further study in this EIS.

Sound Transit and FTA conducted environmental scoping for the EIS from September 30 through October 31, 2011. In December 2011, the Sound Transit Board approved Motion M2011-87, which directed Sound Transit to study light rail alternatives along I-5. The motion also removed from further consideration previously studied alternatives such as bus rapid transit and light rail alignments along SR 99 and 15th Avenue NE. Sound Transit then performed additional planning and analysis of light rail alternatives with station sites and alignments along I-5. In April 2012, the Board approved Motion M2012-17, which identified the alignment and station alternatives to be evaluated in the Draft EIS.

After considering the contents of the Draft EIS and public and agency comments, the Sound Transit Board identified the Preferred Alternative to be evaluated in the Final EIS along with other alternatives (Motion M2013-96, November 2013). The Preferred Alternative is largely based on Alternative A1, Alternative B2, and Alternative C3 as described in the Draft EIS, with modifications to improve benefits, lower costs, or reduce environmental impacts. Motion M2013-96 also

directed Sound Transit to consider modifications and options for the Preferred Alternative and other alternatives, including maintaining access to the Seattle Latvian Evangelical Lutheran Church in Segment A; further studying the option for a station at 220th Street SW in Segment B; and realigning Alternative C3 to better connect with the Lynnwood Transit Center, preserve more redevelopable area, and minimize wetland and stream impacts.

In Segment C, all alternatives would cross an Edmonds School District property that is to be developed as a bus base and district operations center. The District's comment letter on the Draft EIS stated concerns about potential conflicts with its development plans for the property, but also supported a City of Lynnwood proposal to modify Alternative C3. The Preferred Alternative now features several elements of that proposal.

Chapter 2, Alternatives Considered, of the Final EIS describes the alternatives development process, including the alternatives Sound Transit previously removed from further consideration, the Sound Transit Board's directions for the Preferred Alternative, and other modifications and analyses incorporated within the Final EIS.

## S.5 TRANSPORTATION EFFECTS

This section compares transportation conditions anticipated for the year 2035 with and without the light rail alternatives. For context, the project corridor is already highly congested. Travel on I-5 through the corridor currently takes up to three times longer during peak hours than at some other times. Average speeds during peak periods along I-5 now range from 18 miles per hour (mph) to 58 mph, which makes travel times highly variable and unpredictable. Vehicles in the HOV lanes move somewhat better, but HOV lanes are not continuous and peak period travel times for HOV lane users are still double those of the free-flow travel times (see Figure 3-2 in Chapter 3 of the Final EIS). By 2035, conditions on I-5 are

expected to worsen as more vehicles attempt to use the corridor during peak hours, which is already at 98 percent or more of its capacity. When demand is over capacity, operations break down even more.

Over 19,000 transit riders travel daily north and south on the I-5 corridor between Seattle and Lynnwood. Buses can use HOV lanes in some but not all sections. Travel times are not reliable, which is a major problem for both riders and transit operators.

### **S.5.1 TRANSIT RIDERSHIP, TRAVEL TIMES, AND SERVICE QUALITY**

By 2035, between 63,000 and 74,000 transit trips are expected on the Lynnwood Link Extension each day, compared to about 34,000 bus trips under the No Build Alternative.

Transit travel times to regional destinations would be shorter and much more reliable with the Preferred Alternative or any of the other light rail alternatives. Trips to Northgate from Lynnwood would be up to 12 minutes faster, and trips to downtown Seattle from Lynnwood would be up to 16 minutes faster, than with the No Build Alternative in the morning peak period. In addition, the light rail alternatives would be safer, have more frequent service provide, more passenger capacity, and operate more reliably because the light rail would be separated from traffic.

The Lynnwood Station would be the busiest of the new light rail line, with approximately 17,000 to 18,000 boardings daily, depending on station options. In general, the different alignments would have similar ridership, but some of the station options would have more riders than others. In Segment A, the potential for three stations rather than two would slightly increase ridership, but forecasts indicate that three stations would generally reshuffle ridership that would otherwise still use the system with only two stations. In Segment B, the alternative using a freeway station at Mountlake Terrace would have fewer riders than the other three. While the median station would serve the same area, it would require longer

walks, creating a longer total travel time for riders compared to a station at the transit center and park-and-ride. Adding a station in Segment B at 220th Street SW would slightly increase overall trips. Segment C has negligible differences in ridership among the stations.

### **REGIONAL TRAVEL**

By 2035, ridership on any of the light rail alternatives would help reduce travel on roads in the region by more than 270,000 to 290,000 vehicle miles per day, compared with the No Build Alternative, and riders would save up to 25,000 hours in travel time daily.

### **AUTOMOBILE TRAVEL THROUGH THE PROJECT CORRIDOR**

During the morning and evening peak hours, freeway travel times with the light rail alternatives would be similar to or slightly better than with the No Build Alternative in most locations. Freeway congestion and unreliable travel times would still occur.

### **FREEWAY OPERATIONS**

With the No Build Alternative, freeway operations would worsen from today's already congested conditions. Depending on the location, traffic volumes in 2035 would increase 3 percent to 15 percent during peak periods. The average northbound PM peak period speeds would range from approximately 17 mph to 51 mph and are expected to be 35 mph or slower going southbound during the AM peak period. Demand for travel on the freeway would exceed capacity during the heaviest travel times.

The light rail alternatives would result in similar conditions in most locations, and congested conditions would still remain.

The Segment A light rail alternatives with a station at NE 145th Street (Preferred Alternative, A1, A3, A10, and A11) would slightly increase highway traffic and congestion in that interchange area compared to the No Build Alternative. The Segment A alternatives that would modify the NE 130th Street interchange would improve safety and

traffic flow (Preferred Alternative with or without the NE 130th Street Station Option, A1 and A10). The elevated alternatives with a station at NE 130th Street (A7 and A11) but with no changes to the interchange could result in slightly slower I-5 traffic near NE 130th Street.

Other interchanges and freeway conditions north of NE 145th Street to Lynnwood would likely not be appreciably affected by the light rail alternatives compared to the No Build Alternative.

### ARTERIALS AND LOCAL STREETS

With the No Build Alternative in 2035, traffic volumes would increase by about 0.7 percent to 1.3 percent per year, which would cause delays at more of the intersections in the study area than compared to today. The light rail alternatives would draw more trips to station areas, which could increase intersection delays in some locations. However, Sound Transit would mitigate these impacts by adding turn lanes or modifying intersections.

In Segment A, the light rail alternatives would require mitigation to address congestion at two to seven intersections.

In Segment B, none of the light rail alternatives would worsen traffic conditions to levels that require mitigation.

In Segment C, the light rail alternatives would require mitigation to address congestion at three to four intersections.

### OTHER TRANSPORTATION EFFECTS

Sound Transit also examined potential impacts on property access and circulation, nonmotorized facilities, parking, freight, and safety and found there would be no substantial impacts from the Lynnwood Link Extension. However, where interchange modifications are being considered at NE 130th Street, NE 145th Street, and 220th Street SW for the Preferred Alternative and several other alternatives, the Washington State Department of Transportation (WSDOT) and

the Federal Highway Administration (FHWA) could restrict or modify local access as part of the WSDOT permitting process. Such local access changes could include restricted turn movements, driveway consolidation, alternative access for some properties, or property acquisitions. The potential for property impacts to occur is discussed in Section 4.1.

### CONSTRUCTION IMPACTS ON TRANSPORTATION

Project construction would increase congestion and travel delays on I-5 and local streets. Sound Transit would typically have construction sites within the WSDOT right-of-way along I-5 and on local streets or acquired properties adjacent to the project corridor; trucks and equipment would need access to the construction areas. All the light rail alternatives would generate truck trips throughout much of the construction period to haul debris and deliver materials and equipment.

Construction would cause short-term lane closures or restrictions on I-5, particularly when light rail structures are being built over travel lanes or interchanges, or when ramps are being modified; some of the closures, while short term, would increase congestion and delays. For the Preferred Alternative and the other light rail alternatives that would rebuild I-5 overcrossings, closures of the crossing streets during construction would also require detours. The Preferred Alternative and the other alternatives that realign or reconstruct local streets would require closures and detours, some of which could last for several months. Building light rail structures above local streets would require short-term closures and detours.

In Segment A, the alternatives with a NE 130th Street Station (A5, A7, A10, and A11, as well as an option for the Preferred Alternative), or a NE 145th Street Station (the Preferred Alternative and A1, A3, A10, and A11) would have longer construction periods and more short-term I-5 lane or street closures and detours. Alternative A1 would reconstruct the NE 185th Street overpass, and the Preferred Alternative would modify the bridge to expand pedestrian/bicycle access; both

would have some short-term I-5 lane closures. In Segment B, the alternatives cross over part or all of I-5 but at different locations, which would necessitate short-term I-5 lane closures, including some periods with full closures northbound or southbound. In Segment C, all of the alternatives except the Preferred Alternative have an option to cross I-5 lanes from a median alignment, which would require short-term I-5 lane closures.

The alternatives that would place light rail stations or facilities at existing transit centers or park-and-rides would temporarily reduce parking supply and alter access or transit service. This would be expected at the NE 130th Street and NE 145th Street Stations in Segment A where smaller park-and-rides operate today. In Segment B, the Preferred Alternative and Alternatives B1 and B2A would temporarily reduce surface parking east of the existing garage at the Mountlake Terrace Transit Center, but the majority of the transit center's parking would remain available. The Preferred Alternative and Alternatives B1 and B2A would temporarily close the existing Mountlake Terrace freeway transit station during part of the construction period, while Alternative B4's median station construction would permanently close the existing freeway transit station. In Segment C, all the alternatives would temporarily reduce transit parking, but the Lynnwood Transit Center and most of the park-and-ride would still operate throughout project construction.

## S.6 ENVIRONMENTAL EFFECTS

This Summary discusses the project's impacts at two levels: the full project from Northgate to Lynnwood, and then by segment, where there would be some localized differences in impacts. Table S-1 compares the overall environmental effects of the No Build Alternative against the light rail alternatives, while Tables S-2 to S-4 show, by segment, the primary differences in environmental impacts among the alternatives. The subsections below briefly summarize the primary types of impacts by environmental topic and note where

some alternatives would have different impacts compared with others.

**Acquisitions, Displacements, and Relocations.** While the alternatives are designed to use I-5 and other public rights-of-way as much as possible, property acquisitions would be required along sections of the entire project corridor. Sound Transit will compensate owners for acquired properties and will offer relocation assistance consistent with the agency's acquisition and relocation policies and federal requirements. The Segment A Preferred Alternative would acquire 80 full properties and parts of 50 properties. The other light rail alternatives would acquire between 66 and 81 full properties, along with parts of 41 to 47 additional properties. Property impacts would be greatest in Segment A, where the I-5 right-of-way is the narrowest. In Segment A, most of the acquisitions would be residential properties.

In Segment B, considerably fewer parcels would be affected, with the Preferred Alternative acquiring four full properties and parts of 11 properties. The other Segment B alternatives would acquire two to seven full properties, and parts of three to 11 properties.

Segment C would require acquisitions of commercial and residential parcels. The Preferred Alternative in Segment C would acquire five full properties, displacing an estimated nine businesses, and acquire parts of 13 properties. The other light rail alternatives would acquire two to six full properties, and parts of 13 to 26 properties. Alternative C1 would have more displacements than the other alternatives, including 77 residences and 31 businesses.

**Land Use.** Land use would not be adversely affected as a result of any of the light rail alternatives. Acquisitions, both full and partial, in all segments would represent only a small portion of the land available. All alternatives would be generally consistent with regional and local plans and policies. Indirectly, the project could accelerate land use changes in station areas, such as at NE 145th Street or NE 185th Street, the Mountlake

Terrace Transit Center or its freeway station, at 220th Street SW, or at the Lynnwood Station, where local plans or policies allow redevelopment with mixed-use, higher-density, transit-oriented development.

**Economics.** Business impacts would be minimal in Segments A and B, but property acquisition would displace some businesses in Segment C for all alternatives, and employees could be affected by business disruptions or relocations. Local jurisdictions would have a slight initial reduction in property tax revenue as land is converted to a transportation use. However, the proposed project could provide economic benefits to local economies due to increased activity in station areas. Construction would also temporarily improve economic activity through construction employment as well as the purchase of materials. However, construction activities could also temporarily reduce the visibility and patronage of some businesses nearest to the light rail route, primarily in Segment C.

**Neighborhoods.** The proposed project would be on the borders of existing neighborhoods and would have minor effects on community facilities or services. The majority of the project's potential residential displacements are in Segment A, where all light rail alignments would affect residential properties bordering I-5 from about NE 117th Street through NE 195th Street; moreover, the stations would remove up to a block of homes. Alternative C1 would displace a condominium complex. There would be no long-term adverse impacts on neighborhood character and cohesion. Temporary construction impacts, including dust, noise, and traffic congestion, would affect the edges of neighborhoods adjacent to the alternative alignments in all segments.

**Visual and Aesthetic Resources.** Visual impacts would be caused by removing mature trees and dense vegetation that currently screen parts of I-5, by removing homes and other buildings, and by introducing prominent new structures. Some of the alternatives would have light rail guideways,

noise walls, stations, and train operations that would be visually prominent for residents, park users, or travelers, particularly when the alternatives are elevated near neighborhoods or public areas with established views. Areas of high impacts are anticipated for portions of the Preferred Alternative and other alternatives in Segment A where vegetation would be removed and in areas where the alternatives would be developed near residential neighborhoods. For the Preferred Alternative and Alternative B2A in Segment B, areas of high impact would occur where trees and vegetation bordering I-5 would be removed for the guideway north of the Mountlake Terrace Transit Center. Alternatives C1 and C2 in Segment C would have areas of high impact where the guideway is elevated near residences and where trees and vegetation would be removed in or near a park. During construction, views would also be affected as Sound Transit clears the right-of-way and constructs the new facilities, and some work areas would be illuminated for nighttime construction.



*Simulated View of Light Rail near NE 143rd Street*

#### **Air Quality and Greenhouse Gas Emissions.**

The light rail alternatives would decrease pollutants and greenhouse gases from vehicle emissions compared with the No Build Alternative. The project would be consistent with federal air quality standards at local and regional levels. During construction, there would be increased emissions from construction equipment and trucks, as well as more fugitive dust and particulates associated with grading and excavation.

**Table S-1. Summary of Environmental Effects of No Build versus Light Rail Alternatives (All Segments)**

Project Resource	Comparison Factor	No Build Alternative	Light Rail Alternatives
Transportation	Daily corridor ridership	32,000 to 34,000 riders on buses	63,000 to 74,000 riders on light rail
	Vehicle Miles of Travel (VMT)	100,600,000	100,310,000 to 100,330,000
	AM peak transit travel time – Lynnwood to Downtown Seattle	43 minutes	27–29 minutes
	Transit travel time savings at AM peak – Lynnwood to Downtown Seattle	0	14–16 minutes
Acquisitions, Displacements, and Relocations	Total property acquisitions (full and partial)	0	127–179
Land Use	Consistency with Regional and Local Growth Management Plans	Low	High
Water Resources	Increase in impervious surfaces	No direct change	40 to 53 acres, mostly non-pollutant generating surfaces
Ecosystem Resources	Total acres of ecosystem resources affected	0	9-24
Air Quality and Greenhouse Gases	Annual carbon dioxide equivalent reduction	No reduction	76,285 metric tons
Energy	Regional daily transportation energy consumption 2035 (per thousand British thermal units)	602,511	600,023
Electromagnetic Fields (EMF)	Potential for EMF exposure impacts	No new sources	No impacts
Geology and Soils	Risk of worsening geologic and soils conditions	None	None to low
Public Services and Utilities	Demand for services	Population growth and development could increase demand	Development could increase demand for services; all alternatives would be similar
	Potential for service disruption during light rail operation	Not applicable	Unlikely

**Table S-2. Comparison of Segment A Alternatives**

Alternative		PA	A1	A3	A5	A7	A10	A11
Stations		Two: NE 145th and NE 185th Streets	Two: NE 145th and NE 185th Streets	Two: NE 145th and NE 185th Streets	Three: NE 130th, NE 155th, and NE 185th Streets	Three: NE 130th, NE 155th, and NE 185th Streets	Three: NE 130th, NE 145th, and NE 185th Streets	Three: NE 130th, NE 145th, and NE 185th Streets
Profile		Mixed At-Grade and Elevated	Mixed At-Grade and Elevated	Mostly Elevated	Mixed At-Grade and Elevated	Mostly Elevated	Mixed At-Grade and Elevated	Mostly Elevated
Category <sup>a</sup>	Measure							
Capital Cost Range <sup>b</sup>	2014 dollars (in millions)	\$730-\$840	\$760 to \$880	\$790 to \$910	\$740 to \$850	\$830 to \$950	\$750 to \$860	\$850 to \$970
Ridership	2035 daily boardings (net) <sup>c</sup>	12,600 (13,000 <sup>f</sup> )	12,600	9,500	13,000	10,900	10,900	10,900
Station Area Transit-Oriented Development	Qualitative rating of potential under existing conditions (limited-moderate-strong)	NE 145th Street: limited NE 185th Street: limited-moderate	NE 145th Street: limited NE 185th Street: limited-moderate	NE 145th Street: limited NE 185th Street: limited-moderate	NE 130th Street: limited NE 155th Street: limited NE 185th Street: limited-moderate	NE 130th Street: limited NE 155th Street: limited NE 185th Street: limited-moderate	NE 130th Street: limited NE 145th Street: limited NE 185th Street: limited-moderate	NE 130th Street: limited NE 155th Street: limited NE 185th Street: limited-moderate
Transportation	Number of intersections requiring mitigation	2 (3 <sup>f</sup> )	5	6	7	7	4	4
	I-5 bridges rebuilt	NE 130th Street	NE 117th, NE 130th, and NE 185th Streets	---	NE 130th Street	---	NE 130th Street	---
	I-5 ramps relocated	NE 130th Street north off-ramp, NE 145th Street north on-ramp	NE 130th Street north off-ramp	NE 145th Street north on-ramp	NE 130th Street north off-ramp	---	NE 130th Street north off-ramp	NE 145th Street north on-ramp
	Realigned streets	1st Avenue NE 5th Avenue NE 7th Avenue NE	1st Avenue NE 5th Avenue NE 7th Avenue NE	1st Avenue NE	1st Avenue NE 7th Avenue NE	1st Avenue NE	1st Avenue NE 7th Avenue NE	1st Avenue NE
	Number of parking spaces removed <sup>d</sup>	69	69	73	89	77	96	84
Property	Number of full/partial acquisitions	80/50	70/45	66/41	81/47	74/43	77/45	66/41
	Number of residences displaced	121	111	107	123	116	118	107
	Estimated WSDOT right-of-way needed (acres)	19	26	20	20	19	25	20

Alternative		PA	A1	A3	A5	A7	A10	A11
Stations		Two: NE 145th and NE 185th Streets	Two: NE 145th and NE 185th Streets	Two: NE 145th and NE 185th Streets	Three: NE 130th, NE 155th, and NE 185th Streets	Three: NE 130th, NE 155th, and NE 185th Streets	Three: NE 130th, NE 145th, and NE 185th Streets	Three: NE 130th, NE 145th, and NE 185th Streets
Profile		Mixed At-Grade and Elevated	Mixed At-Grade and Elevated	Mostly Elevated	Mixed At-Grade and Elevated	Mostly Elevated	Mixed At-Grade and Elevated	Mostly Elevated
Category <sup>a</sup>	Measure							
Visual and Aesthetic Resources	Low-medium-high impact	Medium	Medium	High	Medium	High	Medium	High
Ecosystem Resources	Wetland/buffer acres affected	0.9/0.3	0.9/0.3	0.9/0.3	0.9/0.8	0.9/0.8	0.9/0.3	0.9/0.3
	Acres of forest vegetation removed	2	2	1	2	1	2	2
Noise	Number of properties affected before/after mitigation <sup>e,f</sup>	306 (309)/0	234/0	476/0	303/0	493/0	283/0	476/0
Vibration	Number of properties affected before/after mitigation	27/0	9/0	8/0	16/0	9/0	14/0	8/0
Parks and Recreational Resources	Resources directly affected	Ridgecrest Park, Shoreline Stadium	Ridgecrest Park, Shoreline Stadium	Ridgecrest Park	Ridgecrest Park	Ridgecrest Park	Ridgecrest Park	Ridgecrest Park

a Only categories with notable impacts or differences among alternatives are shown; Chapters 3 and 4 include the full results for all environmental topics.

b Range reflects contingencies for a conceptual level design. Figures rounded to the nearest \$10 million.

c The net boardings reflect ridership at all the segment stations, minus the drop in ridership that would occur at the Northgate Station; the more sizeable drop is with a station located at NE 130th Street, which overlaps more with the Northgate Station ridership area than a station at NE 145th Street.

d Includes on-street and off-street parking. Does not include park-and-ride spaces.

e Includes park-and-ride noise impacts.

f Preferred Alternative with optional station (in parenthesis).

**Table S-3. Comparison of Segment B Alternatives**

Alternative		PA	B1	B2A	B4
Stations		One: Mountlake Terrace Transit Center	One: Mountlake Terrace Transit Center	Two: Mountlake Terrace Transit Center and 220th Street SW	One: Mountlake Terrace Freeway Station
Alignment		I-5 East Side to I-5 West Side	I-5 East Side to I-5 Median	I-5 East Side to I-5 West Side	I-5 East Side to I-5 Median
Category <sup>a</sup>	Measure				
Capital Cost <sup>b</sup>	2014 dollars (in millions)	\$450 to \$510	\$390 to \$450	\$530 to \$610	\$360 to \$410
Ridership	2035 daily boardings (net) <sup>c</sup>	5,100 (5,300) <sup>e</sup>	5,100	5,100	4,300
Station Area Transit-Oriented Development	Qualitative rating of potential under existing conditions (limited-moderate-strong)	Mountlake Terrace Transit Center: moderate-strong	Mountlake Terrace Transit Center: moderate-strong	Mountlake Terrace Transit Center: moderate-strong 220th Street SW: moderate	Mountlake Terrace Freeway Station: moderate
Property	Number of full/partial acquisitions	4 (10) <sup>e</sup> / 11	2/3	7/11	2/4
	Number of residences displaced	3 (8) <sup>e</sup>	0	5	0
	Estimated WSDOT right-of-way needed (acres)	17	14	16	15
Transportation	Number of parking spaces removed <sup>d</sup>	0	0	11	0
	I-5 bridges rebuilt	NE 195th Street	NE 195th Street	NE 195th Street	NE 195th Street
Ecosystem Resources	Wetland/buffer acres affected	0.8/1.6 (0.5/1.6) <sup>e</sup>	<0.1/0.9	1.6/1.3	0.2/0.7
	Acres of forest vegetation removed	11 (11) <sup>e</sup>	5	11	3
Visual and Aesthetic Resources	Qualitative rating (low-medium-high impact)	High	Low	High	Low
Noise	Number of properties affected before/after mitigation <sup>d</sup>	217 (202) <sup>e</sup> /0	122/0	192/0	110/0

<sup>a</sup> Only categories with noteworthy information, impacts or differences among alternatives are shown; Chapters 3 and 4 include full results.

<sup>b</sup> Range reflects contingencies for a conceptual level design. Figures rounded to the nearest \$10 million.

<sup>c</sup> Net boardings within the segment, less any reduction in ridership that could occur in other segments with an additional station. Adding station at 220th Street SW reduces ridership at Lynnwood by 200 daily boardings.

<sup>d</sup> Includes park-and-ride noise impacts.

<sup>e</sup> Numbers in parentheses are PA with 220th Street South Option.

**Table S-4. Comparison of Segment C Alternatives**

Alternative		PA	C1	C2	C3
Stations					
Category <sup>a</sup>	Measure	At transit center	200th Street SW	At transit center	At park-and-ride
Capital Cost <sup>b</sup>	2014 dollars (in millions)	\$340 to \$380	\$330 to \$380	\$300 to \$340	\$300 to \$390
Ridership	2035 daily boardings (net) <sup>c</sup>	17,900 (17,200) <sup>d</sup>	17,600 to 17,900	17,600 to 17,900	17,600 to 17,900
Station Area Transit-Oriented Development	Qualitative rating of potential under existing conditions (limited-moderate-strong)	Lynnwood Park-and-Ride: moderate-strong	200th Street SW Station: moderate-strong	Lynnwood Transit Center: moderate-strong	Lynnwood Park-and-Ride: moderate-strong
Property	Number of parcels affected (full/partial parcels)	5/13	6/26	5/24	2/13
	Number of residences displaced	0	77	1	0
	Businesses and institutions displaced	9	31	3	1
	Estimated WSDOT right-of-way needed (acres)	2	1	1	3
Transportation	Realigned streets	---	---	---	208th Street SW
	Number of parking spaces removed	27	8	4	0
	Number of intersections requiring mitigation	3 (4 <sup>f</sup> )	3	3	3
Ecosystem Resources	Wetland/buffer acres affected	0.7/1.0	Less than 0.1 - 0.2/0.7 - 1.1	0.9 - 1.1/0.6 - 1.1	0.2 - 0.3/1.0 - 1.7
	Acres of forest vegetation removed	2	1	1	1-2
Visual and Aesthetic Resources	Qualitative rating (low-medium-high impact)	Medium	High	High	Medium
Noise	Number of properties affected before/after mitigation <sup>e</sup>	115/0	226–234/0	148 - 151/0	29 - 79/0
Vibration	Number of properties affected before/after mitigation	0/0	1-2/0	1-2/0	0/0
Parks and Recreational Resources	Resources directly affected	Interurban Trail, Scriber Creek Trail	Interurban Trail, Scriber Creek Park, Scriber Creek Trail	Interurban Trail, Scriber Creek Trail	Interurban Trail, Scriber Creek Trail
Section 4(f)	Resources involving a Section 4(f) use	None	Scriber Creek Park	None	None

<sup>a</sup> Only categories with noteworthy information impacts or differences among alternatives are shown; Chapters 3 and 4 include full results.

<sup>b</sup> Range reflects contingencies for a conceptual level design. Figures rounded to the nearest \$10 million.

<sup>c</sup> Ridership range reflects total boardings at this station, but adjusted to reflect ridership changes caused by additional station(s) in Segment A or B and their effect on ridership in this segment.

<sup>d</sup> Preferred Alternative, with optional stations in Segments A and B.

<sup>e</sup> Includes park-and-ride noise impacts.

<sup>f</sup> Includes option for added parking.

**Noise and Vibration.** There are residences and other noise- and vibration-sensitive properties along the entire project corridor. Most, but not all, of the properties that would need mitigation from noise impacts are in Segment A. Mitigation for long-term vibration impacts would also be needed in Segments A, B, and C. Potential mitigation measures would include noise walls next to the light rail alignment, noise barriers along elevated guideways, residential sound insulation, and vibration-dampening design measures, and would eliminate long-term impacts. Construction-related noise and vibration would be produced by heavy equipment and construction tools, and most noise would be generated during the early phases of construction. The vibration generated during construction is not anticipated to cause damage to structures.

**Ecosystem Resources.** There would be no adverse impacts on threatened or endangered species. All light rail alternatives would cross several streams and tributaries in the project corridor, including Thornton Creek, McAleer Creek, and Scriber Creek, and would affect aquatic resources, vegetation, habitat, streams, wetlands, and buffers. The range of impacts from the Preferred Alternative and other light rail alternatives would be similar, and in most locations the impacts would be reduced through further detailed design efforts. In Segment B, the Preferred Alternative and Alternative B2A would relocate I-5 ramps, affecting wetland areas. The Preferred Alternative 220th Street Station option would shift the alignment west and avoid much of these impacts. In Segment C, the Preferred Alternative and Alternatives C2 and C3 would affect Scriber Creek and its wetlands, although impacts could be reduced through more detailed design to minimize fill as well as construction impacts. Stormwater runoff for the project would be managed to minimize effects on aquatic species.

**Water Resources.** There would be no water quality impacts resulting from stormwater because Sound Transit would comply with local government requirements for stormwater management. However, the project would increase

the amount of existing impervious surface areas. In Segment C, the Preferred Alternative and other alternatives would place guideway columns in the Scriber Creek floodplain, but Sound Transit would provide compensatory floodplain storage. Construction impacts would be controlled by adhering to permit requirements and implementing best management practices, and by fulfilling stormwater management commitments described in the project's Biological Assessment (Appendix O).

**Energy Impacts.** There would be no long-term energy impacts compared with the No Build Alternative because the light rail alternatives would reduce energy consumption regionally. Construction would temporarily increase energy consumption but would not notably alter regional energy supply or demand.

**Geology and Soils.** The project is in a seismically active area; therefore, localized geologic hazards and risks are possible. However, the use of engineering measures would reduce the risk of harm from seismic events.

**Hazardous Materials.** Contaminated soil or groundwater is anticipated on four sites that could be acquired in Segment C for the Preferred Alternative. These sites would be remediated before or during light rail construction, which would be a beneficial effect. The other light rail alternatives would require the acquisition of three to six sites in this segment with known or likely contamination.



*Wetland Near Scriber Creek in Lynnwood*

**Table S-5. Potential Section 4(f) Impacts**

Section 4(f) Resource	Alternatives	Section 4(f) Use Determination
Ridgecrest Park, City of Shoreline	All Segment A Alternatives	<i>De minimis.</i> City of Shoreline has concurred with this determination. Light rail facility would be located on western edge of the park, removing trees that provide an existing visual buffer. Park would experience property and visual impacts but this would not impair park functions.
Shoreline Stadium, Shoreline Public Schools	Preferred Alternative and Alternative A1	<i>De minimis.</i> Shoreline School District has concurred with this determination. Minor right-of-way acquisition would affect a parcel and parking near the stadium.
Interurban Trail, Snohomish County Public Utility District, City of Lynnwood	All Segment C Alternatives	Temporary occupancy. Elevated guideway over trail, with temporary trail closures. Visual impacts, but the trail's primary functions, features, and attributes would be retained.
Scriber Creek Trail, City of Lynnwood	All Segment C Alternatives	Temporary occupancy. Elevated guideway over trail, with temporary trail closures. Visual impacts, but the trail's functions, features, or attributes would be retained.
Scriber Creek Park, City of Lynnwood	Alternative C1	Section 4(f) use. Guideway and structures would cross a corner of the park, removing trees and vegetation, and creating visual impacts.

**Cultural, Archaeological, and Historic Resources.**

Four historic resources in the Area of Potential Effects are eligible for listing on the National Register of Historic Places, including Northgate Elementary, the Northgate Plaza Apartments, a former parsonage in Seattle, and a residence in Shoreline. None of the light rail alternatives would physically alter any of the historic structures, acquire historic property, or adversely impact their historic attributes or setting. There would be no adverse impacts on known archaeological sites, and no traditional cultural properties have been identified in the project corridor.

**Parks and Recreational Resources.** There are numerous parks and recreational resources near the light rail alternative routes. In Segment A, Jackson Park Golf Course would be affected by changed views for all alternatives, but there would be no direct physical impacts on the park.

All Segment A alternatives would place light rail along the western edge of Ridgecrest Park, which would change views and remove mature trees. The Preferred Alternative and Alternative A1 would also require a corner of a parcel containing the Shoreline Stadium and its associated parking lot. The Preferred Alternative also has an option to build a parking garage on the current surface parking area south of the stadium. In Segment B, North City Park would have partially changed views but no direct physical impacts. In Segment C, all the light rail alternatives would cross the Interurban Trail and Scriber Creek Trail on elevated guideways. The Preferred Alternative and Alternative C3 would not affect Scriber Creek Park, while Alternative C1 would cross over a corner of Scriber Creek Park, and Alternative C2 would cross near the park. Alternative C1 would convert park land to a transportation use, which is restricted under a U.S. Department of Transportation (USDOT) regulation known as

Section 4(f). Therefore, as described in Section S.6.2, Alternative C1 would require modification before FTA could approve it.

**Other Environmental Impacts.** There would be no adverse impacts from electromagnetic fields or on public services, safety and security, and utilities.

**Indirect and Cumulative Effects.** Indirect environmental effects would be primarily related to the potential for increased development in station areas. Several of the jurisdictions either have plans in place encouraging mixed-use and higher-density development, or they may consider such policies depending on the final selection of stations to be built as part of the project. Cumulative effects, which are the effects of this project combined with the effects of other projects and actions, would be mostly focused at the start and end points of the project in the urban centers of Northgate and Lynnwood. At Northgate, the Northgate Link Extension is under construction, and other major development projects are also planned nearby. In a separate EIS process, Sound Transit is evaluating sites for a new OMSF, one of which is in Lynnwood near the project (the other 4 sites, including the Preferred Alternative, are in Bellevue). These other projects, if they are constructed at approximately the same time as the Lynnwood Link Extension, could increase overall construction period impacts. The other types of impacts would remain similar to those of the Lynnwood Link Extension alone.

### S.6.1 Mitigation Measures

Sound Transit is committed to meeting the federal, state, and local environmental regulations and permit requirements that would apply to the project. The project would include reasonable mitigation measures to avoid significant adverse impacts. The Final EIS identifies mitigation measures that Sound Transit would apply to avoid or reduce the impacts identified for the project alternatives. The FTA Record of Decision will explicitly make mitigation measures a requirement

of project implementation. A number of the mitigation measures would be further detailed through final design and permitting. Several environmental elements analyzed in the EIS would have no adverse impacts requiring mitigation after standard project measures are applied, including cultural, archaeological, and historic resources; electromagnetic fields; geology and soils; energy; and water resources. The following discussion summarizes key areas where mitigation measures are necessary.

**Transportation.** Sound Transit would mitigate intersections operating below local standards due to the project, or notably below No Build conditions that are already below local standards. Mitigation measures include added turn lanes, intersection/signalization improvements, traffic management, and other improvements as agreed to by the local jurisdiction. The mitigation would improve intersection delay to meet local standards, or to achieve the same level of service or better for intersections that would be below standards with the No Build Alternative.

**Acquisitions, Displacements, and Relocations.** Sound Transit would compensate and help relocate residents and businesses affected by property acquisitions, consistent with Sound Transit policy and applicable federal regulations.



*Simulation of Jackson Park Golf Course with Elevated Alternatives*

**Noise and Vibration.** Sound Transit would implement noise and vibration impact mitigation measures including noise walls (either at-grade

or as part of elevated guideways), insulation for buildings, and special track work.

**Visual Quality.** Sound Transit would provide mitigation in areas identified as having high visual impacts by using landscaping features or visual treatments to retaining walls and other structures, as practical, based on available land, safety, and maintenance and operational needs. Some changes in views would be unavoidable, and short- to medium-term adverse impacts may remain in locations where tree replacement and landscaping must mature to be effective mitigation.

**Ecosystem Resources.** During final design and permitting, Sound Transit will first try to avoid and minimize ecosystem impacts through design measures and best management practices. Where impacts are unavoidable, Sound Transit will mitigate them in accordance with applicable federal regulations, local critical area ordinances, and permit requirements. Sound Transit is committed to no net loss of wetland functions and wetland areas on a project-wide basis.

**Parks and Recreational Facilities.** Sound Transit would implement mitigation measures including compensation or replacement for directly affected properties, restoration or enhancement for any affected features or facilities, and landscaping. For Ridgecrest Park, Sound Transit has identified an area where it would develop replacement park property. For sections of parks or trails affected during construction, Sound Transit would work with local jurisdictions to develop detours, signage, and related measures to minimize the impacts of temporary closures. After construction, affected areas would be restored to existing conditions or better. Alternative C1 would require modifications to adequately mitigate its impacts to Scriber Creek Park.

**Hazardous Materials.** Sound Transit would investigate hazardous materials sites in the construction area and manage them to avoid the potential for exposure or spread of hazardous materials during construction.

**Construction.** Sound Transit would apply mitigation to help minimize or avoid construction impacts for each area of the environment. This includes transportation mitigation to reduce delays due to truck traffic, detours, and lane or street closures. To minimize impacts on communities, businesses, and public services, Sound Transit would have a 24-hour construction hotline for the project. Construction period outreach and communication would include notices of key construction activities, such as changes to transportation facilities or routes. Sound Transit would implement best management practices for construction to reduce impacts on air quality and water quality, reduce noise and vibration, and manage hazardous materials.

### S.6.2 Section 4(f)

Section 4(f) refers to a USDOT statute that restricts FTA's ability to approve a project that adversely affects significant parks, recreation resources, fish and wildlife refuges, and historic properties. Table S-5 lists the Section 4(f) properties that the project may potentially impact or "use." If the impact would be minor and not alter the resource's functions and characteristics, Section 4(f) procedures allow *de minimis* impact findings, with concurrence from the official with jurisdiction over the Section 4(f) resource. Also, under certain conditions, the regulation exempts short-term construction impacts. Otherwise, the project must consider avoidance alternatives.

For the Preferred Alternative, there would be no Section 4(f) use; therefore, no avoidance alternatives are considered. The FTA made *de minimis* determinations for Ridgecrest Park and the Shoreline Stadium, and the affected jurisdictions have concurred. The impacts on the Interurban Trail and Scriber Creek Trail, where short sections would be closed during construction, meet the requirements for a construction-period exception for temporary occupancy. The FTA has determined that a Section 4(f) use would occur with Alternative C1. If it were to be advanced, Alternative C1 would first need to be modified to avoid Scriber Creek Park, or reduce the impact to the park to *de minimis*.

### 5.6.3 Environmental Justice

The Lynnwood Link Extension would be in or near some neighborhoods with minority and low-income populations. Presidential Executive Order 12898, Federal Actions to Address Environmental Justice to Minority Populations and Low-Income Populations, and USDOT Order 5610.2 direct Sound Transit and FTA to identify and meaningfully engage low-income and minority populations about the project, and to consider environmental effects that could fall predominantly on those populations.

The project would not result in disproportionately high and adverse effects on minority and low-income populations after all mitigation, enhancements, and offsetting benefits are considered. The project would cause residential and business displacements that could affect low-income or minority populations. Sound Transit's commitment to provide compensation and relocation assistance would mitigate these impacts. Noise impacts would be mitigated to meet FTA requirements. Some visual impacts

would be unavoidable, and others could remain until replacement trees and landscaping mature. These impacts would be most apparent to people, including low-income and minority populations who live directly along the corridor. However, minority and low-income populations would also be near transit stations that provide benefits by improving mobility and the overall quality of transit service. Many locations along the corridor would experience reduced noise from I-5 as the project replaces traffic noise walls and updates them to meet current standards. Several locations in the corridor would have revised streets and intersections, improving multimodal access and addressing existing safety issues in several locations, which would be benefits.

Construction and operation impacts would affect areas with minority or low-income populations, but planning and outreach, proposed design measures, mitigation measures, and best management practices would reduce or minimize the effects, avoiding high and adverse environmental impacts.

**Table S-6. Consistency with Project Purpose and Need**

Purpose and Need	No Build Alternative	Preferred Alternative	Other Light Rail Alternatives
Provide reliable, rapid, and efficient transit service with sufficient capacity to meet current and projected demand	No	Yes	Yes
Forecast year 2035 transit travel times from Lynnwood to Northgate (AM peak period)	26 minutes	14 minutes	14 to 16 minutes
Forecast year 2035 transit travel times from Northgate to Lynnwood (PM peak period)	24 minutes	14 minutes	14 to 16 minutes
Provide a mobility alternative to travel on congested roadways	No	Yes	Yes
Support the region's adopted land use, transportation, and economic development plans	No	Yes	Yes
Extend the regional light rail system in support of the Sound Transit Long-Range Plan	No	Yes	Yes
Implement a financially feasible system that seeks to preserve and promote a healthy environment	No	Yes	Yes

### S.6.4 Ability of Alternatives to Meet the Purpose and Need

The project's Purpose and Need, detailed in Chapter 1 of the Final EIS, is summarized in Table S-6, to show how effective the Preferred Alternative and the other light rail alternatives would be in meeting the purpose and need of the project.

### S.6.5 Estimated Project Costs

With seven alternatives in Segment A, four in Segment B, and four in Segment C, there are many possible segment combinations that could be linked to create the full 8.5-mile light rail extension from Northgate to Lynnwood. The Preferred Alternative would have total capital costs of \$1.5 to \$1.7 billion, while other alternative combinations would range from \$1.4 to \$2.0 billion. The estimated capital cost of each light rail alternative is presented in Tables S-2, S-3, and S-4. All of the light rail alternatives would cost about \$16 million per year to operate and maintain, but their costs would vary by several hundred thousand dollars annually, depending on how many stations are included. Chapter 5, Evaluation of Alternatives, provides additional details.

## S.7 COMPARISON OF ALTERNATIVES

This section summarizes the primary differences in ridership, environmental impacts, and benefits among the light rail alternatives.

### S.7.1 Segment A: Seattle to Shoreline

All Segment A alternatives would displace a similar number of residences through acquisitions, although the elevated alternatives would be better able to avoid impacts in some areas. The primary differences in property impacts are at the stations. Sound Transit modified the Preferred Alternative and other at-grade Segment A alternatives by realigning 3rd Avenue NE, which maintains access for the Seattle Latvian Evangelical Lutheran Church and church hall (also called the cultural center), avoiding their displacement.

All Segment A alternatives would replace some existing noise walls and install new noise walls, barriers, and other mitigation for noise impacts. The mostly elevated alternatives (A3, A7, and A11) would have the most noise impacts. Mitigation for all alternatives would reduce transit noise to levels below FTA thresholds and avoid increases in traffic noise. The project would also meet local regulatory requirements for construction-related noise control.

While all Segment A alternatives would be visible from the Jackson Park Golf Course, the mostly elevated alternatives (A3, A7, and A11) would have more impacts on views. All alternatives would acquire an edge of Ridgecrest Park in Shoreline. The design for the Preferred Alternative includes replacement property as well as other mitigation details to offset the impacts, but other alternatives would develop similar mitigation. The Preferred Alternative and Alternative A1 include a roadway realignment that would affect part of the Shoreline Stadium parking lot.

The NE 130th Street Station (an option for the Preferred Alternative, and part of A5, A7, A10, and A11) would increase costs, but it would have few other environmental effects than an alignment with no station there. It would slightly increase boardings in Segment A, but overall Link system ridership would be about the same because most of the added station riders would be shifting from either the Northgate Station or the NE 145th Street Station.

The NE 145th Street Station alternatives (Preferred Alternative, A1, A3, A10, and A11) would displace residential properties, require street or interchange modifications, and place a multistory parking garage near residences. However, these alternatives would serve several populous neighborhoods in Seattle and north King County and would have direct I-5 access. The NE 155th Street Station (A5 and A7) would also displace residences and add a multistory garage in a mostly residential area, but it would not have direct I-5 access.

All configurations of the NE 185th Street Station would have similar ridership. At-grade alternatives (Preferred Alternative, A1, A5, and A10) would have more street realignments, while the elevated alternatives would have more visually prominent guideways and an elevated station. All of the alternatives would displace about a block of homes. The Preferred Alternative and Alternative A1 would have a parking garage on the west side of I-5 in an area that would otherwise have few changes with the other alternatives.

Alternatives requiring bridge reconstruction or other bridge overpass improvements would require short-term lane closures on I-5. This would occur at NE 117th Street (A1), NE 130th Street (Preferred Alternative and A1), and NE 185th Street (Preferred Alternative and A1).

Alternatives featuring three stations (A5, A7, A10, and A11) rather than two (Preferred Alternative, A1, and A3) would have higher costs. While three stations would slightly increase ridership in Segment A, they would lengthen travel times. If the Preferred Alternative with the option for the NE 130th Street is selected to be built, it would also have longer travel times and a slight increase in ridership.

### **5.7.2 Segment B: Shoreline to Mountlake Terrace**

The Preferred Alternative and B2A would have high visual impacts as a result of crossing over I-5 and removing dense vegetation on the west side of I-5; however, these impacts described in the Draft EIS have been reduced by modifying the alternatives to avoid WSDOT property established for interstate highway beautification. Alternatives B1 and B4 would have lower visual impacts because more of their alignments would be in the I-5 median.

The Preferred Alternative and B2A alignments along the hillside west of I-5 would remove up to 11 acres of forest cover compared with 5 acres with Alternative B1 and 3 acres with Alternative B4. The Preferred Alternative and B2A would affect the most wetlands and wetland buffer

because the guideway and modified I-5 ramps would cross a pair of wetlands. The Preferred Alternative's option for a 220th Street SW Station would not need to move the ramps, lowering the impacts on adjacent wetlands.

Alternative B2A, which has a station at 220th Street SW, and the Preferred Alternative with an option for an additional station, would have more impervious surfaces requiring stormwater management measures to protect water resources.

During construction, Alternative B4 would need to permanently close the bus ramps at the current freeway transit stop for the Mountlake Terrace Transit Center. This would affect express transit service to the transit center. There would be short-term closures (3 to 6 months plus nighttime closures) of the direct access ramps to the freeway transit stop with the Preferred Alternative and Alternatives B1 and B2A. Sound Transit would alter its own routes and work with other transit agencies to revise transit services, including temporary services between Mountlake Terrace and destinations in King County, to reduce impacts of a temporary closure of the transit center.

The Segment B alternatives would have different ridership, depending on whether a station is sited at the Mountlake Terrace Transit Center (Preferred Alternative, B1, and B2A) or its nearby freeway transit stop (Alternative B4); a freeway station would take longer for riders to access, which would comparatively reduce ridership. The Preferred Alternative with the 220th Street Station option and Alternative B2A would provide an additional station at 220th Street SW, but the project's overall ridership would not notably increase. The added station would attract riders, but there would then be fewer riders boarding at the Mountlake Terrace Transit Center and Lynnwood. Alternatives with two stations would also have higher costs and longer transit travel times.

The Preferred Alternative and Alternatives B1 and B2A would best support potential transit-oriented developments in Mountlake Terrace's planned town center because their station would be east of

I-5, at the existing park-and-ride, with an entrance south of 236th Street SW. This would be closer to the planned town center than the Alternative B4 freeway station.

All of the Segment B alternatives would likely require temporary nighttime construction-period lane closures and other restrictions on I-5 to install girders and construct guideway bridges to cross to the median or the west side of I-5.

### S.7.3 Segment C: Mountlake Terrace to Lynnwood

Although the Preferred Alternative would not displace any residences, it would displace nine businesses, and several other commercial parcels would have partial acquisitions that would affect existing parking spaces. Alternative C1 would acquire a condominium complex and two business parks, displacing up to 77 residences and 31 businesses. In contrast, Alternative C3 would displace one business, and Alternative C2 would displace three businesses and one residence.

Alternatives C1 and C2 would have higher visual impacts than the Preferred Alternative or Alternative C3 because the elevated guideways would be nearer to residential properties and Scriber Creek Park.

Alternative C2 would cross the Scriber Creek wetland complex and affect the largest amount of stream and wetland buffer area. Alternative C1 would cross north of the wetlands with the least amount of impact. The Preferred Alternative and Alternative C3 would cross near the southern end of the Scriber Creek wetland complex, and would have fewer wetland (including wetland buffer) and stream impacts than Alternative C2 but more impacts than Alternative C1.

As for Scriber Creek Park, Alternative C1 would have columns and a section of the elevated guideway within the park along Cedar Valley Road, which would alter this corner of the park and would constitute a Section 4(f) use. Therefore, Alternative C1 could not be built unless it were

redesigned to avoid the use of the park or reduce impacts to a de minimis level. Alternative C2 would not be in the park but would have visual impacts, primarily along the Scriber Creek Trail. The Preferred Alternative and Alternative C3 would not affect the park.

All of the Segment C alternatives would serve the same area and have similar opportunities to support transit-oriented developments, but the station site choices would offer different opportunities for developing the area over time. The Preferred Alternative would reconfigure parts of the existing park-and-ride in order to construct the station and a parking garage. It would allow direct access to the transit center and closer access to the Lynnwood city center. It would avoid dividing part of a block (east of 44th Avenue West) that is targeted for higher-density development, which Alternative C3 would affect. The Alternative C1 station at 200th Street SW would be closest to the designated city center for Lynnwood and would avoid impacts to the existing transit center and park-and-ride during construction; however, this station would displace the most businesses and residences, and it would affect Scriber Creek Park. Alternatives C2 and C3 would be farther from the city center, but Alternative C2 would affect the Scriber Creek wetlands the most, as well as having visual effects on Scriber Creek Park. Alternative C3 would have the fewest displacement impacts, but would be farthest from the transit center and from the city center, and its tail track would bisect a large parcel where the City anticipates higher-density development.

## S.8 PUBLIC AND AGENCY INVOLVEMENT

Sound Transit and FTA have been engaging the public and agencies since the start of early scoping for the project's Alternatives Analysis in 2010. They initiated the Draft EIS with formal public environmental scoping in September and October of 2011, which included meetings with the public and agencies, as well as a comment period and public notices and advertisements. Sound Transit continued to host public events and meet with

agencies and interested groups as the Draft EIS was being prepared in 2012 and early 2013. The release of the Draft EIS came with a formal public review and comment period, including meetings and hearings, as described in Section S.11, Draft EIS and Public Comments. Chapter 6, Public Involvement and Agency Coordination, of the Final EIS has additional details about the project's public involvement and agency coordination plan, including how Sound Transit and FTA have engaged low-income and minority populations in the project. Chapter 7, Draft EIS Comments and Responses of the Final EIS, summarizes the public comments Sound Transit and FTA received on the Draft EIS, and Appendix P, Draft EIS Public Comments and Responses, provides Sound Transit's and FTA's responses to each substantive comment received during the public comment period.

## S.9 AREAS OF CONTROVERSY AND ISSUES TO BE RESOLVED

Public and agency comments suggest limited project-related controversy in most areas. However, during the Draft EIS public review and comment period, Sound Transit and FTA received several hundred comments about potential impacts to the Seattle Latvian Evangelical Lutheran Church, which would have been relocated by some of the Segment A alternatives. The church, individuals, community organizations, and representatives of Latvia asked Sound Transit to avoid displacing the church. In response, Sound Transit developed designs to realign a section of 3rd Avenue NE, maintaining access to the church and avoiding the need to relocate it or its community hall. Also in Segment A, two of the alternatives (A5 and A7) feature a station at NE 155th Street, which the City of Shoreline opposed in a comment letter during environmental scoping and in Draft EIS comments. The 155th Street Station is not an element of the Preferred Alternative.

In Segment C, all alternatives cross an Edmonds School District property that is to be developed as a bus base and district operations center.

The District's comment letter on the Draft EIS opposed alternatives that would affect their development plans, but supported a City of Lynnwood proposal to modify Alternative C3. The Preferred Alternative features several elements of that proposal, as refined by Sound Transit in coordination with the City and the District.

Public comments on the Draft EIS also highlighted impacts to Scriber Creek Park in Segment C. Alternative C1 was considered by commenters to have the greatest impacts to the park and nearby wetlands, followed by Alternative C2. Alternatives C1 and C2, which have elevated sections near Lynnwood neighborhoods and involve acquisition and relocation of businesses and/or residents, were also frequent comment topics. Alternative C3 primarily had comments of support, although comments noted property impacts, wetland impacts, and station location as concerns.

The City of Lynnwood and the Edmonds School District opposed the Lynnwood site alternative for Sound Transit's Link OMSF, which is a separate project that would support light rail operations and maintenance needs for the ST2 program of projects, including the Lynnwood Link Extension. In July 2014, Sound Transit identified a site in Bellevue as the Preferred Alternative for evaluation in the Final EIS along with the other OMSF alternatives. A final decision on the siting will be made after the Final EIS is issued for that project.

Issues yet to be resolved relate to agreements that Sound Transit must secure from WSDOT and FHWA to use parts of the I-5 right-of-way permanently as well as during construction. In addition to needing approvals for the use of the right-of-way, Sound Transit would need approvals for modifying any I-5 interchange or other parts of the freeway, such as shoulders or existing noise walls; for constructing staging and access; for implementing any lane closures affecting the interstate highway; and for conducting any modifications that could affect highway operations or safety. Most of these approvals would occur during final design. Sound Transit has coordinated with FHWA and WSDOT to develop conceptual

engineering definitions for the alternatives, but as final design progresses, FHWA or WSDOT could request modifications or place other restrictions on the project. Sound Transit has worked successfully with WSDOT and FHWA to obtain approvals for right-of-way use for other Sound Transit projects, but it would affect the project costs, construction impacts, and work schedule if Sound Transit is not able to use the right-of-way as anticipated in the current design of the alternatives.

Project funding also remains an issue to be resolved. Sound Transit is proposing the project as a candidate for FTA's Capital Investment Grant (New Starts) grants program. Recent legislation has changed some of the requirements for the program, and its longer-term funding levels are subject to congressional appropriation.

Potential stations at NE 130th Street, NE 155th Street, and 220th Street SW were not evaluated in the ST2 planning process, which analyzed ridership and cost for each station, and are not currently included in the ST2 Plan. Consistency with the ST2 Plan would need to be further evaluated before any of these stations could be added to the Lynnwood Link Extension.

## S.10 SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

With the avoidance, mitigation, and minimization measures detailed in Chapter 3, Transportation Impacts and Mitigation, and Chapter 4, Environmental Impacts and Mitigation, of the Final EIS, significant adverse impacts would be avoided for most alternatives. However, some impacts might not be fully mitigated. All alternatives would replace mature vegetation with light rail facilities, and there would be related loss of habitat. This would also result in longer-term visual impacts that would not be immediately mitigated by replacement vegetation or landscaping. Temporary construction impacts, such as freeway lane closures, street closures, or truck traffic, would cause congestion and inconveniences in some locations, and these impacts could be significant.

## S.11 DRAFT EIS AND PUBLIC COMMENTS

The Draft EIS was available for an extended comment period of 60 days (July 26 to September 23, 2013) that included four public hearings and other opportunities for the public and agencies to comment in person or in writing. Chapter 7, Draft EIS Comments and Responses, details how the public was able to comment.

The Sound Transit Board of Directors considered the public and agency comments received as well as the information in the Draft EIS. The Board then identified a Preferred Alternative for evaluation in the Final EIS along with the other light rail alternatives.

## S.12 NEXT STEPS

The Sound Transit Board will consider the analysis in the Final EIS 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.

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 Code of Federal Regulations (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 may rely on 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.